

**NUCLEAR REGULATORY COMMISSION
ISSUANCES**

**OPINIONS AND DECISIONS OF THE
NUCLEAR REGULATORY COMMISSION
WITH SELECTED ORDERS**

January 1, 2018 – June 30, 2018

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PREFACE

This is the eighty-seventh volume of issuances (1–187) of the Nuclear Regulatory Commission and its Atomic Safety and Licensing Boards, Administrative Law Judges, and Office Directors. It covers the period from January 1, 2018, to June 30, 2018.

Atomic Safety and Licensing Boards are authorized by Section 191 of the Atomic Energy Act of 1954. These Boards, comprised of three members, conduct adjudicatory hearings on applications to construct and operate nuclear power plants and related facilities and issue initial decisions which, subject to internal review and appellate procedures, become the final Commission action with respect to those applications. Boards are drawn from the Atomic Safety and Licensing Board Panel, comprised of lawyers, nuclear physicists and engineers, environmentalists, chemists, and economists. The Atomic Energy Commission (AEC) first established Licensing Boards in 1962 and the Panel in 1967.

Between 1969 and 1990, the AEC authorized Atomic Safety and Licensing Appeal Boards to exercise the authority and perform the review functions which would otherwise have been exercised and performed by the Commission in facility licensing proceedings. In 1972, that Commission created an Appeal Panel, from which were drawn the Appeal Boards assigned to each licensing proceeding. The functions performed by both Appeal Boards and Licensing Boards were transferred from the AEC to the Nuclear Regulatory Commission by the Energy Reorganization Act of 1974. Appeal Boards represented the final level in the administrative adjudicatory process to which parties could appeal. Parties, however, were permitted to seek discretionary Commission review of certain board rulings. The Commission also could decide to review, on its own motion, various decisions or actions of Appeal Boards.

On June 29, 1990, however, the Commission voted to abolish the Atomic Safety and Licensing Appeal Panel, and the Panel ceased to exist as of June 30, 1991. Since then, the Commission itself reviews Licensing Board and other adjudicatory decisions, as a matter of discretion. *See* 56 FR 29403 (1991).

The Commission also may appoint Administrative Law Judges pursuant to the Administrative Procedure Act, who preside over proceedings as directed by the Commission.

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Issuances are referred to as follows: Commission (CLI), Atomic Safety and Licensing Boards (LBP), Administrative Law Judges (ALJ), Directors' Decisions (DD), and Decisions on Petitions for Rulemaking (DPRM).

The summaries and headnotes preceding the opinions reported herein are not to be deemed a part of those opinions or to have any independent legal significance.

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

E. Roy Hawkens, Chairman
Dr. Michael F. Kennedy
Dr. Richard E. Wardwell

In the Matter of

Docket No. 50-458-LR
(ASLBP No. 17-956-01-LR-BD01)

ENTERGY OPERATIONS, INC.
(River Bend Station, Unit 1)

January 8, 2018

This proceeding concerns a petition to intervene challenging Entergy Operations, Inc.'s license renewal application for River Bend Station, Unit 1. Petitioner proffered three contentions, alleging that (1) the Environmental Report (ER) does not properly state a purpose and need for the proposed licensing action; (2) the application's no action alternative analysis does not adequately consider renewable energy and energy efficiency as alternatives; and (3) the application does not adequately consider whether the concrete in the concrete drywell is susceptible to alkali-silica reaction. The Board denies the petition, concluding that petitioner has standing but fails to proffer an admissible contention.

RULES OF PRACTICE: INTERVENTION

An entity seeking to intervene in a licensing proceeding must demonstrate standing and proffer a contention that satisfies this agency's contention admissibility criteria. *See* 10 C.F.R. § 2.309(a)-(d), (f).

RULES OF PRACTICE: MOTIONS TO STRIKE

A motion to strike material in the reply will be denied when the challenged material bears a sufficient nexus to the facts and arguments in the initial petition and answers. *See DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 2), CLI-15-18, 82 NRC 135, 146 (2015).

RULES OF PRACTICE: STANDING

A licensing board has an independent obligation to determine whether a petitioner satisfies standing requirements. *See* 10 C.F.R. § 2.309(d)(2).

RULES OF PRACTICE: STANDING

A board applies contemporaneous judicial concepts of standing, which require a petitioner to “(1) allege an injury in fact that is (2) fairly traceable to the challenged action and (3) is likely to be redressed by a favorable decision.” *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-15-25, 82 NRC 389, 394 (2015).

RULES OF PRACTICE: STANDING (PROXIMITY PRESUMPTION)

For certain licensing proceedings (e.g., reactor construction permit proceedings and new reactor operating license proceedings), the Commission has authorized the use of a “proximity presumption,” which “presume[s] that a petitioner has standing to intervene if the petitioner lives within . . . approximately 50 miles of the facility in question.” *Calvert Cliffs 3 Nuclear Project, LLC, and Unistar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-09-20, 70 NRC 911, 915-16 (2009). This presumption “rests on [the] finding . . . that persons living within the roughly 50-mile radius of [a] facility face a realistic threat of harm if a release from the facility of radioactive material were to occur.” *Id.* at 917 (internal quotation marks omitted).

RULES OF PRACTICE: STANDING (PROXIMITY PRESUMPTION)

As the Commission explained in *Calvert Cliffs*, the 50-mile proximity presumption “is simply a shortcut for determining standing in certain cases,” CLI-09-20, 70 NRC at 917, including — by implicit approval — reactor license renewal cases. *See id.* at 915 n.15.

RULES OF PRACTICE: STANDING (REPRESENTATIONAL)

An organization that seeks to establish representational standing must show that (1) at least one of its members would otherwise have standing to sue in his or her own right; (2) the member has authorized the organization to represent his or her interests; (3) the interests that the organization seeks to protect are germane to its purpose; and (4) neither the claim asserted nor the relief requested requires the member to participate in the adjudicatory proceeding. *See Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-99-10, 49 NRC 318, 323 (1999).

RULES OF PRACTICE: CONTENTIONS (ADMISSIBILITY)

The six-factor contention admissibility standard in 10 C.F.R. § 2.309(f)(1) is “strict by design,” *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-01-24, 54 NRC 349, 358 (2001), and “failure to fulfill any one of the[] requirements renders a contention inadmissible.” *Energys Nuclear Operations, Inc.* (Indian Point, Unit 2), CLI-16-5, 83 NRC 131, 136 (2016). This agency’s contention admissibility rule “properly ‘reserve[s] our hearing process for genuine, material controversies between knowledgeable litigants.’” *FirstEnergy Nuclear Operating Co.* (Davis-Besse Nuclear Power Station, Unit 1), CLI-12-8, 75 NRC 393, 396 (2012) (quoting *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Unit 2), CLI-03-14, 58 NRC 207, 219 (2003)).

NEPA: ENVIRONMENTAL REPORT

NEPA requires an ER to address the environmental impacts of the proposed action and compare them to impacts of “‘reasonable’ alternatives” to the proposed action. *NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 1), CLI-12-5, 75 NRC 301, 338 (2012) (quoting *NRDC v. Morton*, 458 F.2d 827, 837, 838 (D.C. Cir. 1972)); *see also Hydro Resources, Inc.* (P.O. Box 15910, Rio Rancho, NM 87174), CLI-01-4, 53 NRC 31, 55 (2001) (“Agencies need only discuss those alternatives that are reasonable and ‘will bring about the ends’ of the proposed action.”) (quoting *Citizens Against Burlington v. Busey*, 938 F.2d 190, 195 (D.C. Cir.), *cert. denied*, 502 U.S. 994 (1991)); *see also Morton*, 458 F.2d at 837-38 (explaining that NEPA does not require consideration of alternatives that are “only remote and speculative possibilities”).

NEPA: CONSIDERATION OF ALTERNATIVES

In the context of reactor license renewal applications, “[f]or an alternative

energy source to be considered reasonable . . . the alternative should be commercially viable and technically capable” of producing the required baseload power in the region of interest by the expiration date of the license. *Davis-Besse*, CLI-12-8, 75 NRC at 400. At the contention admissibility stage, the petitioner bears the burden of providing some minimal “factual support or expert opinion sufficient to demonstrate a genuine dispute as to whether an alternative energy source — or combination of sources — can meet that standard.” *Id.*; *see also id.* at 402 (“The mere potential for, or theoretical capacity of,” renewable and energy efficiency in lieu of nuclear power “is insufficient to show their commercial viability as a source of baseload power in the [region of interest] by [the expiration date of the license].”); *see also id.* at 401 (for an alternative energy source to be deemed reasonable, it must be a “current or impending reality” in the region of interest).

RULES OF PRACTICE: CONTENTIONS (CHALLENGE TO LICENSE APPLICATION)

A petitioner must present a “fact-based argument that actually and specifically challenges the application,” and a contention “that fails directly to controvert the license application . . . is subject to dismissal.” *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 341-42 (1999) (internal quotation marks omitted).

LICENSE RENEWAL: AGING MANAGEMENT

The Commission has stated that an “applicant’s use of an aging management program identified in the GALL Report constitutes reasonable assurance that it will manage the targeted aging effect during the renewal period.” *AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), CLI-08-23, 68 NRC 461, 468 (2008).

MEMORANDUM AND ORDER (Denying Sierra Club’s Petition for Intervention and Request for Hearing)

Pending before this Licensing Board is a Petition to Intervene and Request for Hearing filed by Sierra Club. *See* Petition to Intervene and Request for Adjudicatory Hearing by Sierra Club (Oct. 12, 2017) [hereinafter Petition]. The petition challenges an application by Entergy Operations, Inc. (Entergy) to renew the operating license for River Bend Station, Unit 1 (River Bend), located

in St. Francisville, Louisiana, for 20 years beyond the current expiration date of August 29, 2025. Sierra Club proffers three contentions: two contentions challenge River Bend's Environmental Report (ER),¹ and one contention challenges River Bend's aging management review results.² *See* Petition at 6, 8, 30.

For the reasons discussed below, we conclude that, although Sierra Club establishes standing, it fails to proffer an admissible contention. We therefore deny its petition to intervene.

I. PROCEDURAL BACKGROUND

On May 25, 2017, Entergy submitted a license renewal application (LRA)³ for River Bend pursuant to 10 C.F.R. Part 54. *See* Letter from William F. Maguire, Site Vice President to Document Control Desk, NRC (May 25, 2017) (ADAMS Accession No. ML17153A285). On August 14, 2017, the NRC Staff accepted the LRA for docketing and issued an Opportunity to Request a Hearing and Petition for Leave to Intervene, which provided 60 days from the date of publication to file a petition to intervene in the LRA proceeding. *See* Entergy Operations Inc.; River Bend Station, Unit 1, 82 Fed. Reg. 37,908, 37,908-09 (Aug. 14, 2017).

On October 12, 2017, Sierra Club timely filed a petition to intervene in the LRA proceeding and proffered three contentions. *See* Petition at 6, 8, 30. On November 6, 2017, Entergy and the NRC Staff filed oppositions to the petition, arguing that all three contentions are inadmissible. *See* Entergy's Answer Opposing Sierra Club's Petition to Intervene and Request for Adjudicatory Hearing (Nov. 6, 2017) [hereinafter Entergy's Answer]; NRC Staff's Response to Petition to Intervene and Request for Hearing Filed by the Sierra Club (Nov. 6, 2017) [hereinafter NRC Staff's Answer]. Sierra Club filed a reply on November 13, 2017. *See* Sierra Club's Reply to Answers Opposing Sierra Club's Petition to Intervene (Nov. 13, 2017) [hereinafter Reply].

On November 17, 2017, Entergy moved to strike portions of Sierra Club's reply. *See* Motion to Strike Portions of Sierra Club Reply to Answers (Nov. 17, 2017) [hereinafter Entergy's Motion to Strike]. On November 21, 2017, the NRC Staff filed an answer supporting Entergy's motion, *see* NRC Staff's An-

¹ *See* Entergy, River Bend Station, License Renewal Application, Appendix E — Applicant's Environmental Report (May 2017) (ADAMS Accession No. ML17174A531) [hereinafter ER].

² *See* Entergy, River Bend Station, License Renewal Application, Appendix B — Aging Management Programs and Activities (May 2017) (ADAMS Accession No. ML17153A287) [hereinafter AMP].

³ *See* Entergy, River Bend Station, License Renewal Application (May 2017) (ADAMS Accession No. ML17153A286) [hereinafter LRA].

swer to Entergy's Motion to Strike Portions of Sierra Club Reply to Answers (Nov. 21, 2017), and on November 27, 2017, Sierra Club filed an answer opposing Entergy's motion. *See* Sierra Club's Answer in Opposition to Entergy's Motion to Strike Portions of Reply (Nov. 27, 2017).

On November 30, 2017, this Board held an oral argument to assess Sierra Club's standing and the admissibility of its contentions. *See* Official Transcript of Proceedings, Entergy Operations, Inc. River Bend Station Unit 1 Oral Argument at 1-100 (Nov. 30, 2017) [hereinafter Tr.].

II. ANALYSIS

An entity seeking to intervene in a licensing proceeding must demonstrate standing and proffer a contention that satisfies this agency's contention admissibility criteria. *See* 10 C.F.R. § 2.309(a)-(d), (f). As discussed below, we conclude that Sierra Club demonstrates standing but fails to proffer an admissible contention.

Before analyzing Sierra Club's intervention request, however, we address Entergy's motion to strike certain material in Sierra Club's reply. *See* Entergy's Motion to Strike, Attachment, Red-Line of Sierra Club's Reply at 3-8. In our view, the challenged material bears a sufficient nexus to the facts and arguments in the initial petition and answers to warrant being included in the reply, and we therefore deny Entergy's motion. *See DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 2), CLI-15-18, 82 NRC 135, 146 (2015). To the extent Entergy asserts that it lacked an opportunity to respond to allegedly new arguments in the reply, *see* Entergy's Motion to Strike at 4, those concerns are mooted by our determination that Sierra Club's proffered contentions are inadmissible.

A. Sierra Club Satisfies Standing Requirements

Although neither Entergy nor the NRC Staff challenges Sierra Club's standing, *see* Entergy's Answer at 2, NRC's Answer at 7, a licensing board has an independent obligation to determine whether a petitioner satisfies standing requirements. *See* 10 C.F.R. § 2.309(d)(2). We apply contemporaneous judicial concepts of standing, which require a petitioner to "(1) allege an injury in fact that is (2) fairly traceable to the challenged action and (3) is likely to be redressed by a favorable decision." *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-15-25, 82 NRC 389, 394 (2015). For certain licensing proceedings, however (e.g., reactor construction permit proceedings and new reactor operating license proceedings), the Commission has authorized the use of a "proximity presumption," which "presume[s] that a petitioner has standing to intervene if the petitioner lives within . . . approximately

50 miles of the facility in question.” *Calvert Cliffs 3 Nuclear Project, LLC, and Unistar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-09-20, 70 NRC 911, 915-16 (2009). This presumption “rests on [the] finding . . . that persons living within the roughly 50-mile radius of [a] facility face a realistic threat of harm if a release from the facility of radioactive material were to occur.” *Id.* at 917 (internal quotation marks omitted).

The Commission has not explicitly held that the 50-mile proximity presumption applies in reactor license renewal proceedings. In the *Calvert Cliffs* combined license application case, however, the Commission cited with approval a licensing board decision that applied the proximity presumption in a reactor license renewal proceeding. *See* CLI-09-20, 70 NRC at 915 n.15 (citing *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), LBP-01-6, 53 NRC 138, 150, *aff’d on other grounds*, CLI-01-17, 54 NRC 3 (2001)). During oral argument in this case, the NRC Staff stated that, in its view, the Commission’s favorable reference to the standing analysis in the *Turkey Point* case indicates that the Commission has “implicitly endorsed” applying the 50-mile proximity presumption in reactor license renewal proceedings. Tr. at 72. We agree.⁴

Here, Sierra Club seeks to establish representational standing; that is, it seeks to intervene on behalf of one or more of its members. *See* Petition at 3. Sierra Club must therefore show that (1) at least one of its members would otherwise have standing to sue in his or her own right; (2) the member has authorized Sierra Club to represent his or her interests; (3) the interests that Sierra Club seeks to protect are germane to its purpose; and (4) neither the claim asserted nor the relief requested requires the member to participate in the adjudicatory proceeding. *See Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-99-10, 49 NRC 318, 323 (1999).

Sierra Club satisfies these four requirements for representational standing. Sierra Club filed an affidavit from one of its members declaring that he (1) authorizes Sierra Club to represent his interests; (2) lives about 30 miles from River Bend, thus satisfying the 50-mile proximity presumption for standing; and (3) is the Conservation Chair for the Delta Chapter of the Sierra Club, and in that capacity, he knows that the interests Sierra Club seeks to protect in this proceeding are germane to its purpose. *See* Petition, Attachment, Declaration of William Fontenot. Additionally, the claims asserted by Sierra Club and the

⁴ As the Commission explained in *Calvert Cliffs*, the 50-mile proximity presumption “is simply a shortcut for determining standing in certain cases,” CLI-09-20, 70 NRC at 917, including — by implicit approval — reactor license renewal cases. *See id.* at 915 n.15. Such a bright-line rule in this cabined category of cases not only satisfies contemporaneous judicial concepts of standing, *see id.* at 917, it provides clarity for litigants and licensing boards, thereby promoting efficiency in the adjudicatory process.

relief it requests do not require its members to participate in this proceeding. Sierra Club therefore has standing.

B. Sierra Club Fails to Proffer an Admissible Contention

Contentions are admissible if they satisfy the six-factor contention admissibility criteria in 10 C.F.R. § 2.309(f)(1), which requires a petitioner to

- (i) Provide a specific statement of the issue of law or fact to be raised or controverted . . . ;
- (ii) Provide a brief explanation of the basis for the contention;
- (iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding;
- (iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding;
- (v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue . . . , together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue; [and]
- (vi) . . . [P]rovide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact. This information must include references to specific portions of the application . . . that the petitioner disputes and the supporting reasons for each dispute

10 C.F.R. § 2.309(f)(1).

This standard is “strict by design,” *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-01-24, 54 NRC 349, 358 (2001), and “failure to fulfill any one of these requirements renders a contention inadmissible.” *Entergy Nuclear Operations, Inc.* (Indian Point, Unit 2), CLI-16-5, 83 NRC 131, 136 (2016). As the Commission has observed, this agency’s contention admissibility rule “properly ‘reserve[s] our hearing process for genuine, material controversies between knowledgeable litigants.’” *FirstEnergy Nuclear Operating Co.* (Davis-Besse Nuclear Power Station, Unit 1), CLI-12-8, 75 NRC 393, 396 (2012) (quoting *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Unit 2), CLI-03-14, 58 NRC 207, 219 (2003)).

1. Contention 1 Is Inadmissible Because It Fails to Raise a Genuine Dispute with the ER

Contention 1 asserts that “[t]he [ER] submitted by [Entergy] does not properly and adequately state a purpose and need for the relicensing of River Bend Station.” Petition at 6. In support of Contention 1, Sierra Club argues that (1) the ER “does not actually state a purpose and need,” *id.* at 7; and (2) to the

extent the ER states a purpose and need, the statement is impermissibly narrow, resulting in an environmental analysis that fails to consider reasonable alternatives to renewing River Bend's operating license. *See id.* at 7-8. We conclude that Contention 1 fails to raise a genuine dispute with the ER, as required by 10 C.F.R. § 2.309(f)(1)(vi).

First, Sierra Club errs in asserting that the ER "does not actually state a purpose and need for the relicensing of the River Bend Station." Petition at 7. The ER's purpose and need statement reads in relevant part: "The purpose and need for the proposed action (i.e., issuance of a renewed nuclear plant operating license) is to provide an option that allows for baseload power generation capability [of 967 net megawatts electric (MWe)] beyond the term of the current nuclear power plant operating license [in August 2025] to meet future system generating needs." ER at 1-1. Sierra Club's claim that the ER does not state a purpose and need for the proposed action is manifestly incorrect and fails to raise a genuine dispute.

Second, contrary to Sierra Club's assertion, the purpose and need statement is not so narrow as to foreclose consideration of reasonable alternatives to the renewal of River Bend's license, thereby making renewal "a foregone conclusion." Reply at 2. As shown above, the ER states that the purpose and need for the proposed action "is to provide an *option* that allows for baseload power generation capability beyond [August 2025] to meet future system generating needs." ER at 1-1 (emphasis added). Nothing in the purpose and need statement indicates that the proposed action of renewing River Bend's license is the *only* option that would allow for baseload power generation capability in Louisiana beyond 2025. Moreover, Sierra Club fails to identify any provision in the ER that purports to foreclose consideration of other energy alternatives.

In fact, the ER considers at least eighteen alternatives as options to the renewal of River Bend's license, *see* ER at 2-34 to 2-35, 7-1 to 7-57, including purchased power; plant reactivation or extended service life of older gas-fired units; demand-side management, which includes energy efficiency, energy conservation, and demand response initiatives; wind; solar technologies, including photovoltaic cells and solar thermal power; hydropower; geothermal energy; wood waste; municipal solid waste; other biomass-derived fuels; fuel cells; oil; ocean wave and current energy; and coal-fired integrated gasification combined cycle. *See id.* at 2-35, 7-4 to 7-12. The ER ultimately concludes that the above energy options are not reasonable because they "would not satisfy the purpose and need for the proposed action." *Id.* at 2-33.

The ER concludes, however, that four alternatives are reasonable because they could be "commercially viable on a utility scale and operational prior to the expiration of [River Bend's license in August 2025]," ER at 7-1, and it subjects each of them to an extensive environmental impact analysis. These four alternatives that the ER deems to be reasonable are (1) natural gas-fired energy

generation at the River Bend site, *see id.* at 7-13 to 7-23; (2) coal-fired energy generation at the River Bend site, *see id.* at 7-23 to 7-33; (3) new nuclear energy generation at the River Bend site, *see id.* at 7-33 to 7-41; and (4) a combination of alternatives consisting of a natural gas-fired plant and biomass plants at the River Bend site, coupled with demand-side management programs. *See id.* at 7-42 to 7-53.

In short, the ER's purpose and need statement demonstrably allows for the consideration of a full spectrum of baseload power alternatives. Sierra Club's erroneous claim to the contrary in Contention 1 fails to raise a genuine dispute with the ER, as required by 10 C.F.R. § 2.309(f)(1)(vi).⁵

2. *Contention 2 Is Inadmissible Because It Fails to (1) Raise a Genuine Dispute with the ER and (2) Lay an Adequate Factual Foundation*

Contention 2 alleges that “[i]n examining the no action alternative, the ER improperly failed to include renewable energy and energy efficiency as a consequence of the River Bend license not being renewed.” Petition at 8. On its face, Contention 2 is framed as a contention of omission, alleging that the ER improperly fails to consider renewable energy and energy efficiency as alternatives to renewing River Bend's license. Additionally, based on Sierra Club's arguments, we construe Contention 2 as a claim that the ER's analysis of wind power, solar power, and energy efficiency *in combination* is inadequate. *See id.* at 10-30; Reply at 4-5.

As we show below, Contention 2 is not admissible. First, insofar as Contention 2 alleges that the ER failed to consider renewable energy and energy efficiency as alternatives to renewing River Bend's license, it fails to raise a genuine dispute, as required by 10 C.F.R. § 2.309(f)(1)(vi). Second, insofar as Contention 2 claims that the ER's analysis of wind, solar, and energy efficiency in combination is inadequate, it fails to lay an adequate factual foundation, as required by 10 C.F.R. § 2.309(f)(1)(v). The ER is only required to consider reasonable alternatives to the renewal of River Bend's license, and Sierra Club

⁵ Sierra Club's petition also asserts that the ER's purpose and need statement constitutes “an abdication of the NRC's duty under NEPA,” Petition at 6, insofar as it says that future energy needs “may be determined by other energy-planning decisionmakers, such as State, utility, and, where authorized, Federal agencies (other than the NRC).” ER at 1-1. At oral argument, Sierra Club abandoned this argument, conceding that NEPA does not impose an obligation on the NRC to engage in energy-planning decisions. *See* Tr. at 14. At the same time, however, Sierra Club endeavored to put a different gloss on its “abdication” argument, asserting that it was “talking about the purpose and need for the relicensing of River Bend[, which, in turn] . . . dictates the range of alternative[s] considered[.]” Tr. at 15. To the extent Sierra Club meant that the purpose and need statement improperly restricts the range of alternatives to be considered, *see* Tr. at 11-15, such a claim fails to raise a genuine dispute for the reasons discussed *supra* in text.

fails to proffer alleged facts or expert opinion to support the proposition that a combination of wind, solar, and energy efficiency is a reasonable alternative that must be considered in the ER.

a. To the Extent Contention 2 Alleges That the ER Failed to Consider Wind, Solar, and Energy Efficiency as Alternatives, It Fails to Raise a Genuine Dispute

Contention 2 alleges that the ER does not include a discussion of renewable energy and energy efficiency as alternatives to the renewal of River Bend's license. *See* Petition at 8. As Entergy and the NRC Staff explain, however, the ER does, in fact, contain a robust discussion of wind, solar, and energy efficiency, and it concludes that none is a reasonable alternative for replacing River Bend's production of baseload power in Louisiana by 2025. *See* Entergy's Answer at 13-15; NRC Staff's Answer at 22-26.⁶

For example, regarding wind power, the ER analyzes several reports including (1) a 2015 report by the National Renewable Energy Laboratory that reviewed wind energy potential for Louisiana utilizing current and near-term commercial wind turbine technology; (2) a 2015 handbook prepared by Sandia National Laboratories on energy storage for utility decisionmakers, "which discusses the existing and emerging energy storage options for deployment to meet a range of energy storage needs"; and (3) a 2012 U.S. Fish and Wildlife Service report documenting the potential environmental impacts to ecological resources caused by wind turbines. ER at 7-6. Based on these reports, the ER concludes that onshore wind power does not present a reasonable alternative to the renewal of River Bend's license because of the "potentially LARGE impacts of siting wind energy facilities on a large scale and the need for an energy storage system that provides adequate storage and capabilities to inject the stored energy into the grid." *Id.* at 7-7. The ER similarly concludes that offshore wind power "is not considered a reasonable alternative" because (1) "Louisiana's offshore areas . . . have the lowest classification (fair) for potential wind energy development," *id.*; and (2) potential environmental impacts would not only be similar to those associated with onshore wind power, they would also include adverse impacts on "marine life, coastal terrestrial communities, avian communities, aesthetics, fishing . . . , and boating and yachting safety." *Id.*

⁶Renewable energy and energy efficiency are discussed in (1) Section 2.6 of the ER, which explains the alternatives to the renewal of River Bend's license and the criteria for determining what constitutes reasonable alternatives to the renewal of River Bend's license, *see* ER at 2-33 to 2-35; and (2) Chapter 7 of the ER, which discusses and analyzes energy options that were deemed to be reasonable alternatives to River Bend's generating capacity, *see id.* at 7-1 to 7-3, 7-13 to 7-53, as well as options that were deemed to be unreasonable alternatives. *See id.* at 7-4 to 7-12.

Regarding solar power, the ER analyzes several reports including a 2012 National Renewable Energy Laboratory report discussing solar radiation potential throughout Louisiana, including in the Entergy Louisiana, LLC service territory. *See* ER at 7-7. Based on this report and others, the ER concludes that solar power does not present a reasonable alternative to the renewal of River Bend’s operating license because of “the relatively modest amount of solar radiation in Louisiana, increased land requirements for a utility-scale facility to provide replacement power, intermittency of the power source, need for energy storage, and a capacity factor of 20 to 25 percent when producing electricity from solar power versus [River Bend]’s capacity factor of 90 percent.” *Id.* at 7-8.

Finally, as to energy efficiency, the ER “reviewed deployment of a full range of existing and potentially deployable [demand-side management (i.e., energy efficiency)] programs across the residential, commercial, and industrial sectors served by Entergy,” and concluded that “[t]he [demand-side management] potential within the Entergy Louisiana, LLC service area is not adequate for the replacement of [River Bend’s] generating capacity.” ER at 7-5 to 7-6.

Sierra Club fails to acknowledge, much less challenge, any of the above analyses in the ER. Accordingly, insofar as Contention 2 alleges that the ER fails to consider wind, solar, and energy efficiency as alternatives, it is factually incorrect and, thus, inadmissible for failing to raise a genuine dispute with the ER, as required by 10 C.F.R. § 2.309(f)(1)(vi).

b. To the Extent Contention 2 Claims That the ER Should Have Considered a Combination of Wind, Solar, and Energy Efficiency as a Reasonable Alternative to the Renewal of River Bend’s License, It Fails to Lay an Adequate Factual Foundation

In support of Contention 2, Sierra Club also argues that the ER is deficient because it fails to consider a combination of wind, solar, and energy efficiency as a reasonable alternative to the renewal of River Bend’s operating license. *See* Petition at 10; Reply at 5. Sierra Club fails, however, to provide alleged facts or expert opinion to support this aspect of Contention 2, as required by 10 C.F.R. § 2.309(f)(1)(v).⁷

⁷In its argument underlying Contention 2, Sierra Club also asserts, without elaboration, that the ER should have analyzed (1) “whether the River Bend Station is needed to produce the power required to serve the people of Louisiana”; and (2) “whether there is another, perhaps better, way to deliver that power.” Petition at 9-10. Regarding the first assertion, as stated *supra* note 5, Sierra Club abandoned its argument that NEPA requires an agency to engage in energy-planning decisions. Regarding the second assertion, NEPA does not establish a “perhaps better” standard for determining the range of alternatives that an agency must consider. Rather, as discussed *infra* note 8 and accompanying text, NEPA requires an agency to consider “reasonable” alternatives.

NEPA requires an ER to address the environmental impacts of the proposed action and compare them to impacts of “‘reasonable’ alternatives” to the proposed action. *NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 1), CLI-12-5, 75 NRC 301, 338 (2012) (quoting *NRDC v. Morton*, 458 F.2d 827, 837, 838 (D.C. Cir. 1972)).⁸ In the context of reactor license renewal applications, “[f]or an alternative energy source to be considered reasonable . . . the alternative should be commercially viable and technically capable of,” producing the required baseload power in the region of interest by the expiration date of the license. *Davis-Besse*, CLI-12-8, 75 NRC at 400. At the contention admissibility stage, the petitioner bears the burden of providing some minimal “factual support or expert opinion sufficient to demonstrate a genuine dispute as to whether an alternative energy source — or a combination of sources — can meet that standard.” *Id.*

Applying the above principles here, for Contention 2 to satisfy 10 C.F.R. § 2.309(f)(1)(v), Sierra Club was required to provide alleged facts or expert opinion supporting the proposition that a combination of wind, solar, and energy efficiency would be (1) commercially viable and technically capable of producing 967 net MWe (2) in Louisiana (3) by 2025. See *Davis-Besse*, CLI-12-8, 75 NRC at 400; *Seabrook Station*, CLI-12-5, 75 NRC at 342. This Sierra Club failed to do.

Instead, in support of Contention 2, Sierra Club’s petition simply cites to numerous studies and reports that lay a foundation for the following propositions: (1) by interconnecting renewable energy sources to the transmission grid and employing other technologies, renewable energy sources, such as wind and solar power, could provide reliable baseload power;⁹ (2) the Federal Energy Regulatory Commission has recently adopted policies that promote the expansion of

⁸ See also *Hydro Resources, Inc.* (P.O. Box 15910, Rio Rancho, NM 87174), CLI-01-4, 53 NRC 31, 55 (2001) (“Agencies need only discuss those alternatives that are reasonable and ‘will bring about the ends’ of the proposed action.”) (quoting *Citizens Against Burlington v. Busey*, 938 F.2d 190, 195 (D.C. Cir.), cert. denied, 502 U.S. 994 (1991)); see also *Morton*, 458 F.2d at 837-38 (explaining that NEPA does not require consideration of alternatives that are “only remote and speculative possibilities”).

⁹ See Petition at 10 (citing Cristina L. Archer & Mark Z. Jacobson, *Supplying Baseload Power and Reducing Transmission Requirements by Interconnecting Wind Farms*, 46 J. Applied Meteorology & Climatology 1701 (2007)), 11-12 (citing Mark Z. Jacobson & Mark A. Delucchi, *Providing All Global Energy with Wind, Water, and Solar Power, Part I: Technologies, Energy Sources, Quantities and Areas of Infrastructure, and Materials*, 39 Energy Pol’y 1154 (2011); and Mark Z. Jacobson & Mark A. Delucchi, *Providing All Global Energy with Wind, Water, and Solar Power, Part II: Reliability, System and Transmission Costs, and Policies*, 39 Energy Pol’y 1170 (2011)), 16 (citing Arjun Makhijani, *Carbon-Free and Nuclear-Free: A Roadmap for U.S. Energy Policy* (2007) [hereinafter 2007 Makhijani Book]), 20-21 (citing George Crabtree & Jim Misewich, *Integrating Renewable Electricity on the Grid* (2010) [hereinafter 2010 Crabtree & Misewich Report]).

the transmission grid;¹⁰ (3) certain renewable energy sources are becoming more widespread and cost-effective;¹¹ (4) renewable energy sources provide certain benefits not provided by nuclear power or fossil fuels;¹² and (5) in Louisiana, offshore wind power could be further developed as a potential source of energy.¹³

Relying on the above-cited sources, Sierra Club broadly asserts “that there are numerous ways to get to a clean and renewable energy future without nuclear power.” Petition at 18. That general assertion might be true in theory, but for present purposes, it is quite beside the point. Sierra Club’s sources, whether viewed individually or cumulatively, fail to lay the required factual foundation for the proposition that a combination of renewables and energy efficiency will be commercially viable and technically capable of producing 967 net MWe in Louisiana by 2025, as required by 10 C.F.R. § 2.309(f)(1)(v). See *Davis-Besse*, CLI-12-8, 75 NRC at 402 (“The mere potential for, or theoretical capacity of,” renewable and energy efficiency in lieu of nuclear power “is insufficient to show their commercial viability as a source of baseload power in the [region of interest] by [the expiration date of the license.]”); see also *id.* at 401 (for an alternative energy source to be deemed reasonable, it must be a “current or impending reality” in the region of interest).

In the *Davis-Besse* license renewal proceeding, the Commission acknowledged that the studies and reports relied on by petitioners provided support for the propositions that (1) wind and solar are capable of producing significant energy in ideal locations; (2) wind power could produce significant gross capacity in the region of interest; and (3) technological alternatives such as storage and integrated energy sources may eventually be able to compensate for the intermittency of wind and solar and become sufficiently reliable to constitute baseload power. See CLI-12-8, 75 NRC at 400-01. The Commission nevertheless concluded that petitioners failed to satisfy 10 C.F.R. § 2.309(f)(1)(v) because they

¹⁰ See Petition at 18-19 (citing FERC, Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities, Order No. 1000, 18 C.F.R. Part 35 (2011)).

¹¹ See Petition at 22-25 (citing Am. Council on Renewable Energy, *The Outlook for Renewable Energy in America* (2014)), 28-29 (citing Maggie Molina, *The Best Value for America’s Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs* (2014)).

¹² See Petition at 10 (citing Mark Z. Jacobson, *Review of Solutions to Global Warming, Air Pollution, and Energy Security*, 2 Energy & Envtl. Sci. 148 (2009)), 14 (citing R. Neal Elliott et al., *Avoiding a Train Wreck: Replacing Old Coal Plants with Energy Efficiency* (2011); and Dan York & Martin Kushler, *The Old Model Isn’t Working: Creating the Energy Utility for the 21st Century* (2011)), 27-28 (citing Int’l Energy Agency, *Capturing the Multiple Benefits of Energy Efficiency* (2014)).

¹³ See Petition at 29-30 (citing Bryan Crouch, *Offshore Louisiana Wind Power*, La. Energy Topic (2004) [hereinafter 2004 Crouch Study]; and Bob Spreche & Bryan Crouch, *Economics of Offshore Wind Power* (2005) [hereinafter 2005 Spreche & Crouch Study]).

“failed to lay a foundation for their claim that wind, solar, and energy storage — in any combination — could satisfy the baseload demand in the region of interest by [the expiration date of the license].” *Id.* at 401. In our view, the rationale in *Davis-Besse* applies with equal force here and mandates the rejection of Contention 2 pursuant to 10 C.F.R. § 2.309(f)(1)(v).¹⁴

In sum, Sierra Club failed to provide alleged facts or expert opinion to support the proposition that a combination of wind, solar, and energy efficiency is a reasonable alternative to the renewal of River Bend’s operating license. This failure is fatal to Contention 2’s assertion that the ER’s consideration of such a combination is inadequate, *see* Petition at 10, because NEPA imposes no requirement to consider alternatives that are not reasonable.¹⁵

¹⁴Not only do Sierra Club’s sources fail to provide the necessary factual foundation required by 10 C.F.R. § 2.309(f)(1)(v), many of them are in significant tension with, or fatally undercut, a conclusion that renewable energy and energy efficiency would be capable of replacing River Bend’s baseload power generation by 2025. For example, the 2007 Makhijani Book states that “[i]t is technologically and economically feasible to phase out CO₂ emissions and nuclear power . . . at reasonable cost by 2050,” 2007 Makhijani Book at 147, which is 25 years beyond when it would be needed to replace River Bend’s baseload generation. The 2010 Crabtree & Misewich Report states that integrating renewable resources on the grid will require *additional research to find solutions to technological challenges*. *See* 2010 Crabtree & Misewich Report at 29 (“The grid faces two new and fundamental technological challenges in accommodating renewables: location and variability.”); *id.* (“Solutions to the challenges of remote location and variability of generation are needed.”); *id.* at 30 (Each of the potential “solutions to variability . . . requires significant research and development.”). The 2004 Crouch Study acknowledges that *obstacles hamper the development of offshore wind energy in Louisiana*, stating that the “main drawbacks to wind generated electricity are its high capital costs and the intermittency of the wind,” and other “drawbacks . . . include both aesthetics and associated bird fatalities.” 2004 Crouch Study at 2. Moreover, it declares that Louisiana’s “offshore wind resource is, to date, still somewhat of an unknown,” and its “*onshore wind resource has virtually no potential for wind power development.*” *Id.* at 3 (emphasis added). Finally, the 2005 Spreche & Crouch Study confirms that the “offshore wind regime is still something of an unknown,” and it states that “no offshore wind farms have actually been built in the U.S.” 2005 Spreche & Crouch Study at 1.

Notably, after citing several studies that discuss the progress some states have made in implementing renewable energy and energy efficiency, *see* Petition at 22-29, Sierra Club concedes that “Louisiana has not thus far been a leader in developing renewable energy and energy efficiency.” *Id.* at 29.

¹⁵Sierra Club’s petition singles out the “no action alternative” analysis in the ER as being deficient for failing to consider the “viable alternatives” of wind, solar, and energy efficiency in combination. Petition at 10. As shown *supra* in text, however, Sierra Club failed to provide support for its assertion that these so-called “viable alternatives” are reasonable. Accordingly, Entergy was not required to consider a combination of these alternatives in any portion of the ER, including the no action alternative analysis.

3. *Contention 3 Is Inadmissible Because It Fails to Raise a Genuine Dispute with the LRA*

Contention 3 alleges that “[t]he LRA does not undertake an adequate aging management review of the concrete on the containment vessel.” Petition at 30. Relying solely on an NRC Information Notice issued in November 2011, *see* NRC Information Notice 2011-20, Concrete Degradation by Alkali-Silica Reaction (Nov. 18, 2011) (ADAMS Accession No. ML112241029) [hereinafter IN-2011-20], Sierra Club alleges that (1) River Bend’s Mark III concrete drywell is susceptible to alkali-silica reaction (ASR)-induced concrete degradation; and (2) River Bend’s LRA does not adequately address ASR. *See* Petition at 31. We conclude that Contention 3 is not admissible, because it fails to raise a genuine dispute with the LRA, as required by 10 C.F.R. § 2.309(f)(1)(vi).

We first summarize the LRA’s treatment of ASR, and we then address Sierra Club’s arguments.¹⁶

a. The LRA’s Treatment of ASR

As Entergy and the NRC Staff explain, *see* Entergy’s Answer at 25; NRC Staff’s Answer at 31-32, Entergy’s LRA does not use the term “alkali-silica reaction” or “ASR.” Instead, consistent with an NRC guidance document called the “GALL Report,” the LRA uses the term “reaction with aggregates,” which, by definition, includes ASR.¹⁷ The LRA thus addresses ASR by stating that, although River Bend “has not identified operating experience with occurrences of [degradation due to reaction with aggregates (which includes ASR)],” Entergy has nevertheless “conservatively elected to manage this aging effect” in River

¹⁶It appears that Sierra Club initially intended Contention 3 to be a contention of omission as well as one of adequacy. *See* Petition at 31 (Sierra Club asserts that River Bend’s LRA “does not address the degradation of the concrete drywell due to ASR.”); *id.* at 32 (“The [LRA] for River Bend does not include any discussion of ASR-induced degradation.”). During oral argument, however, Sierra Club prudently renounced its omission claim because, as shown *infra* Part II.B.3.a, Entergy’s LRA expressly provides for the aging management of reaction with aggregates, which, by definition, includes ASR. *See* Tr. at 36 (Sierra Club affirms that it is “no longer concerned that ASR is not being discussed in the [LRA], but rather that it is not adequately being discussed.”).

¹⁷The GALL Report defines the term “Reaction with Aggregates” as follows:

The presence of reactive alkalis in concrete can lead to subsequent reactions with aggregates that may be present. These alkalis are introduced mainly by cement, but also may come from admixtures, salt-contamination, seawater penetration, or solutions of deicing salts. *These reactions include alkali-silica reactions, cement-aggregate reactions, and aggregate-carbonate reactions. These reactions may lead to expansion and cracking.*

Division of License Renewal, Office of Nuclear Reactor Regulation, Generic Aging Lessons Learned (GALL) Report, NUREG-1801, Rev. 2, at IX-36 (Dec. 2010) (emphasis added) (ADAMS Accession No. ML103490041) [hereinafter GALL Report].

Bend's Mark III concrete drywell "by the Structures Monitoring Program." LRA at 3.5-12. River Bend's Structures Monitoring Program, in turn, states that it "will be consistent with the program described in [the GALL Report], Section XI.S6, Structures Monitoring Program." AMP at B-146.

The Structures Monitoring Program in the GALL Report "consists of periodic visual inspections [i.e., on a frequency not to exceed 5 years] by personnel qualified to monitor structures and components for applicable aging effects." GALL Report at XI S6-1. "Structures are monitored under this program using periodic visual inspection . . . to ensure that aging degradation will be detected and quantified before there is loss of intended function." *Id.* at XI S6-2. The visual inspection's acceptance criteria "calls for inspection results to be evaluated by qualified engineering personnel based on acceptance criteria . . . [that, *inter alia*,] consider industry and plant operating experience." *Id.* at XI S6-3. Insofar as acceptance criteria for visual inspections of River Bend's Mark III concrete drywell are based on "industry experience," *id.*, those criteria will include the information contained in Information Notice 2011-20. *See* Tr. at 66-68, 91. Moreover, the visual inspections provided in the GALL Report comport with inspections contemplated in the Information Notice, which states that "visual inspections of concrete can identify the . . . cracking and the presence of [ASR] gel." IN-2011-20 at 3.

Finally, the GALL Report states that "[c]orrective actions are initiated in accordance with the corrective action process if the evaluation results indicate there is a need for a repair or replacement. As discussed in the Appendix for [the] GALL [Report], the [NRC Staff] finds the requirements of 10 CFR Part 50, Appendix B, acceptable to address the corrective actions." GALL Report at XI S6-4. Moreover, the GALL Report declares that "[t]here is reasonable assurance that implementation of the structures monitoring program described [in the GALL Report] will be effective in managing the aging of the in-scope structures . . . through the period of extended operation." *Id.*

b. Contention 3 Fails to Raise a Genuine Dispute with the LRA

The arguments advanced by Sierra Club in support of Contention 3 do not raise a genuine dispute on a material issue of law or fact regarding the LRA's discussion of ASR, as required by 10 C.F.R. § 2.309(f)(1)(vi). First, Sierra Club's complaint that the LRA's discussion of ASR is "extremely brief and simply refers to Entergy's Structures Monitoring Program," Reply at 7, does not suffice. A petitioner must present a "fact-based argument that actually and specifically challenges the application," and a contention "that fails directly to controvert the license application . . . is subject to dismissal." *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 341-42 (1999) (internal quotation marks omitted). Sierra Club's simplistic assertion that

the LRA's discussion of ASR is inadequate because it merely refers to Entergy's Structures Monitoring Program, *see* Reply at 7, does not specify a deficiency in the LRA, and it is therefore insufficient to raise a genuine dispute.¹⁸

Similarly unavailing is Sierra Club's argument that the LRA's discussion of ASR is deficient because it makes no reference to the American Society for Testing and Materials (ASTM) standards that are discussed in the Information Notice. *See* Reply at 8. Admittedly, as Sierra Club states, the Information Notice says that old ASTM standards previously used by licensees during construction of a nuclear power plant "may not accurately predict aggregate reactivity when dealing with late- or slow-expanding aggregates containing strained quartz or microcrystalline quartz." *Id.* (quoting IN-2011-20 at 3). The Information Notice therefore advises licensees that if, during construction, they "tested [concrete] using [the standards in] ASTM C227 and ASTM C289 [they] could have concrete that is susceptible to ASR-induced degradation." *Id.* (quoting IN-2011-20 at 3). Sierra Club criticizes the River Bend LRA because its discussion of ASR "makes no reference to any of these standards." *Id.*

But the LRA's failure to discuss the ASTM standards is not a deficiency. The reason the Information Notice mentioned the ASTM standards was to put licensees on notice that if, during construction of a concrete structure, they tested the concrete using old ASTM standards, the concrete could nevertheless be susceptible to ASR-induced degradation. *See* IN-2011-20 at 3. There was no need for the River Bend LRA to discuss ASTM standards because Entergy conservatively assumed that the River Bend concrete drywell could be susceptible to ASR-induced degradation, even though no evidence of such degradation had ever been observed. *See* LRA at 3.5-12. The River Bend LRA states that it will manage the possibility of such degradation in accordance with its Structures Monitoring Program, which comports with the GALL Report and thus takes into account the ASR concerns discussed in the Information Notice. *See id.*; AMP at B-146; *supra* note 18. Sierra Club's claim that the LRA is deficient for failing to discuss the ASTM standards does not, therefore, raise a genuine dispute on an issue of material law or fact regarding the adequacy of the LRA's treatment

¹⁸ Sierra Club incorrectly claims that the LRA lacks "any indication that the concerns set forth in the [I]nformation [N]otice are being addressed at River Bend." Reply at 8. As explained *supra* Part II.B.3.a, River Bend's Structures Monitoring Program is "consistent" with the GALL Report, *see* AMP at B-146, and the visual inspections required by the Structures Monitoring Program will address the ASR concerns set forth in the Information Notice. *See* IN-2011-20 at 3 ("[V]isual inspections of concrete can identify the unique 'map' or 'patterned' cracking and the presence of [ASR] gel."); Tr. at 36 (Sierra Club acknowledges that the "first step" for identifying ASR deterioration is a visual inspection). Moreover, the acceptance criteria for visual inspections described in the GALL Report consider industry experience, *see* GALL Report at XI S6-3, which includes the Information Notice's concern about ASR. *See* Tr. at 66-68, 91.

of ASR-induced degradation in River Bend's drywell, as required by 10 C.F.R. § 2.309(f)(1)(vi). Contention 3 is therefore not admissible.¹⁹

III. CONCLUSION AND ORDER

For the foregoing reasons, this Board *denies* Sierra Club's petition to intervene, thereby terminating this proceeding at the Board level. Sierra Club may appeal this decision to the Commission within 25 days of service of this order. Any party opposing the appeal may file a brief in opposition within 25 days after service of the appeal. *See* 10 C.F.R. § 2.311(b).

It is so ORDERED.

THE ATOMIC SAFETY AND
LICENSING BOARD

E. Roy Hawkens, Chairman
ADMINISTRATIVE JUDGE

Dr. Michael F. Kennedy
ADMINISTRATIVE JUDGE

Dr. Richard E. Wardwell
ADMINISTRATIVE JUDGE

Rockville, Maryland
January 8, 2018

¹⁹ Nor is Contention 3 supported by adequate alleged facts or expert opinion, as required by 10 C.F.R. § 2.309(f)(1)(v). Sierra Club relies solely on the Information Notice to support Contention 3, even though Sierra Club acknowledged at oral argument that the Information Notice imposes no requirements on the River Bend LRA. *See* Tr. at 33; *see also* IN-2011-20 at 1 (“[S]uggestions contained in this [Information Notice] are not NRC requirements; therefore, no specific action . . . is required.”). Notably, the Commission has stated that an “applicant’s use of an aging management program identified in the GALL Report constitutes reasonable assurance that it will manage the targeted aging effect during the renewal period.” *AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), CLI-08-23, 68 NRC 461, 468 (2008). Here, the River Bend LRA is consistent with the GALL Report, *see supra* Part II.B.3.a, and nothing in the Information Notice (or in any of the arguments proffered by Sierra Club) provides a factual foundation for the proposition that the LRA’s conformance with the GALL Report is inadequate for managing the possibility of ASR-induced degradation in River Bend’s drywell.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

G. Paul Bollwerk, III, Chairman
Dr. Richard E. Wardwell
Dr. Thomas J. Hirons

In the Matter of

Docket No. 40-8943-MLA-2
(ASLBP No. 13-926-01-MLA-BD01)

CROW BUTTE RESOURCES, INC.
(Marsland Expansion Area)

March 16, 2018

In this proceeding concerning applicant Crow Butte Resources, Inc.'s (CBR) license amendment application seeking authorization to operate a satellite in situ uranium recovery facility within the Marsland Expansion Area, in Dawes County, Nebraska, the Licensing Board grants in part and denies in part an NRC Staff motion to deny the migration of the environmental portion of intervenor Oglala Sioux Tribe's sole remaining contention raising hydrogeology concerns, concluding that while the Staff's uncontested showing that its draft environmental assessment (EA) contains omitted information that was lacking in CBR's environmental report (ER) warrants dismissal of the environmental portion of that aspect of the contention, the Staff's migration denial request regarding the balance of the contention must be rejected because of the Staff's failure to meet its burden to establish that the EA contained new information and analysis relating to the contention that was not sufficiently similar to the information and analysis in CBR's ER so as to preclude the contention's migration from challenging the applicant's ER to contesting the Staff's draft EA.

RULES OF PRACTICE: CONTENTIONS (NEPA MIGRATION TENET)

The Commission has recognized that a contention challenging an applicant's ER generally may be viewed by a board as a challenge to the Staff's subsequently issued National Environmental Policy Act (NEPA)-related environmental review documents. See *Louisiana Energy Services, L.P.* (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 84 (1998). This migration tenet, as it has been labeled, allows a previously admitted contention challenging an applicant's ER to be construed as a challenge to a later-issued Staff environmental review document (such as an EA) without requiring the contention's proponent to file a new or amended contention. See *Crow Butte Resources, Inc.* (In Situ Leach Facility, Crawford, Nebraska), CLI-15-17, 82 NRC 33, 42 n.58 (2015).

RULES OF PRACTICE: CONTENTIONS (NEPA MIGRATION TENET)

A board need only permit migration of an admitted contention "where the information in the Staff's environmental review document is 'sufficiently similar' to the material in the applicant's environmental report." *Strata Energy, Inc.* (Ross In Situ Uranium Recovery Project), CLI-16-13, 83 NRC 566, 570 n.17 (2016) (quoting *Strata Energy, Inc.* (Ross In Situ Recovery Uranium Project), LBP-13-10, 78 NRC 117, 133 (2013), *petition for review denied*, CLI-16-13, 83 NRC at 601), *petition for review denied sub nom. Nat. Res. Def. Council v. NRC*, 879 F.3d 1202, 1206-07 (D.C. Cir. 2018). Thus, migration is appropriate so long as the draft EA's "analysis or discussion at issue is essentially *in para materia* with the ER analysis or discussion that is the focus of the contention." *Southern Nuclear Operating Co.* (Early Site Permit for Vogtle ESP Site), LBP-08-2, 67 NRC 54, 63-64 (2008).

RULES OF PRACTICE: CONTENTIONS (NEPA MIGRATION TENET)

The proponent of the contention is not required to resubmit the contention if it maintains the contention properly will migrate. See *Ross*, LBP-13-10, 78 NRC at 143 n.15. "[A] contention's sponsor may choose not to make any submission regarding an admitted ER-based environmental contention it believes properly will migrate and can simply await an applicant or Staff filing challenging the contention's continued viability in light of the Staff's environmental document." *Id.*

RULES OF PRACTICE: BURDEN OF PROOF (MOTION); MOTION TO DENY MIGRATION (BURDEN OF PROOF)

The Commission’s rules of practice provide that the proponent of a motion has the burden of proof. *See* 10 C.F.R. § 2.325. Accordingly, when a motion challenging contention migration is filed, the movant has the burden of proof to show that migration should not be permitted. Such a motion also must “state with particularity the grounds” upon which relief is sought, and “be accompanied by any affidavits or other evidence relied on.” *Id.* § 2.323(b).

RULES OF PRACTICE: MOTION TO DENY MIGRATION (BURDEN OF PROOF)

To meet its burden the proponent of a motion to deny migration must (1) detail what new information or analysis is included in the Staff’s environmental review document; and (2) explain why that information or analysis is relevant to the deficiencies challenged in the contention and provides a reasonable basis for concluding that those deficiencies have been adequately addressed.

RULES OF PRACTICE: CONTENTIONS (NEPA MIGRATION TENET; CONTENTION OF OMISSION; CONTENTION OF ADEQUACY)

In applying the migration tenet, consideration also must be given to the case law that distinguishes between a contention of omission and a contention of adequacy. *See, e.g., Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-28, 56 NRC 373, 382-83 (2002) (“There is, in short, a difference between contentions that merely allege an ‘omission’ of information and those that challenge substantively and specifically how particular information has been discussed in a license application.”).

RULES OF PRACTICE: CONTENTIONS (NEPA MIGRATION TENET; CONTENTION OF OMISSION)

If a contention is one of omission — for instance, challenging an absence of information in an ER — and new licensing documents are provided that supply such information, the previous contention loses its efficacy and the adequacy of the new information should become the focus of concern in that “new claims must be raised in a new or amended contention.” *Id.* at 382; *see also id.* at 383 (“[A] significant change in the nature of the purported NEPA imperfection, from one focusing on comprehensive information omission to one centered on a deficient analysis of subsequently supplied information, *warrants issue modification*

by the complaining party.” (quoting *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-02-2, 55 NRC 20, 30 (2002)). The migration tenet thus may not be used to change the basic form of a contention from a contention of omission to one of adequacy. See *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-01-23, 54 NRC 163, 172 n.3 (2001).

RULES OF PRACTICE: MIGRATION DECLARATION

A migration declaration submitted by an admitted contention’s sponsor, whether alone or in conjunction with a new/amended contention motion, provides an opportunity for the sponsor to avoid any doubt as to its position on the status of the contention.

RULES OF PRACTICE: MIGRATION DECLARATION

Consistent with agency case law, a contention’s sponsor’s failure to submit a Board-requested migration declaration is not, in and of itself, a reason for the Board to refuse to allow the contention to migrate as a challenge to the Staff’s draft EA. See *Ross*, LBP-13-10, 78 NRC at 143 n.15.

RULES OF PRACTICE: MOTION TO DENY MIGRATION (BURDEN OF PROOF; PLEADING REQUIREMENTS)

If the Staff or the applicant maintains that the migration tenet is not applicable, it can request that the Board deny migration of the contention. For such a motion to succeed, however, the moving party has the burden of establishing with specificity that migration is not appropriate because the draft EA is not substantially similar to the ER. And to make that showing, the moving party must establish where and how the draft EA diverges from the ER, and why that divergence makes the contention no longer viable.

RULES OF PRACTICE: MOTION TO DENY MIGRATION (PLEADING REQUIREMENTS)

To prevail on a motion to deny migration, it is incumbent on the movant to plead its motion with specificity and adequately support all points required for a board to grant the motion. See, e.g., *U.S. Department of Energy* (High-Level Waste Repository), LBP-08-5, 67 NRC 205, 209-10 (holding that a proponent of a motion seeking an order striking a discovery certification bore the burden “of supporting all points required for such an order”), *aff’d*, CLI-08-22, 68

NRC 355, 358 (2008). In the context of a motion to deny migration of a contention, the motion's proponent must do more than simply point the board to sweeping sections of the draft EA as new and relevant to the admitted contention. Instead, the movant must adequately explain (1) why those sections in the draft EA are not substantially similar to the analysis and discussion contained in the ER; and (2) why the new analysis and discussion provide a reasonable basis for concluding that the deficiencies in the ER challenged by the admitted contention have been adequately addressed, aside from the bare fact that it is new information.

**RULES OF PRACTICE: MOTION TO DENY MIGRATION
(PLEADING REQUIREMENTS)**

It is not the Board's responsibility to search through the Staff's lengthy and technically dense draft EA to determine whether the information contained therein would meet the standard to prevent migration. *See FirstEnergy Nuclear Operating Co.* (Davis-Besse Nuclear Power Station, Unit 1), CLI-12-8, 75 NRC 393, 404 n.67 (2012) (“[N]either [the Commission] nor the Board is obliged to look through lengthy documents for information on which a litigant relies.”).

**RULES OF PRACTICE: MOTION TO DENY MIGRATION
(PLEADING REQUIREMENTS)**

It is not enough to indicate that the information in a draft EA is “new and different” so as to prevent migration of a contention of adequacy. The movant has the burden of pointing out exactly what allegedly new information or analysis is contained in the draft EA, and how exactly that new information or analysis provides a reasonable basis for concluding the information adequately addresses the contention such that a new/amended contention is required. *See Fansteel, Inc.* (Muskogee, Oklahoma Site), CLI-03-13, 58 NRC 195, 204 (2003) (affirming that a petitioner has an obligation not just to refer generally to voluminous documents, but to provide analysis and supporting evidence as to why particular sections of those documents provide a basis for a contention); LBP-13-6, 77 NRC at 285 (noting petitioner required to explain the significance of any information contained in a document provided as the basis for the contention).

**RULES OF PRACTICE: MOTION TO DENY MIGRATION
(PLEADING REQUIREMENTS)**

The Board will not “hunt for such evidence” that the draft EA is not substantially similar to the ER, “plumb the record” for arguments that there is a

reasonable basis to conclude that the new information adequately addresses the deficits, or generally “do counsels’ work for them.” *Nat. Res. Def. Council*, 879 F.3d at 1209.

**RULES OF PRACTICE: MOTION TO DENY MIGRATION
(PLEADING REQUIREMENTS; SUPPORTING INFORMATION OR
EXPERT OPINIONS)**

Not dissimilarly from the pleading requirements for a motion to deny migration, when an intervenor seeks to admit a new or amended contention, the agency’s rules of practice require, among other things, that the filing be based on information that is “materially different” from that which was previously available. 10 C.F.R. § 2.309(c)(1)(ii). In arguing that this requirement has been satisfied, a board reasonably may expect the petitioner will provide appropriate affidavits, declarations, or other information explaining to the board why the subsequent licensing documents contain new information that is materially different such that the petitioner could not have proffered the contention earlier in the proceeding. *See Ross*, LBP-13-10, 78 NRC at 134 (noting intervenors provided multiple declarations with expert statements supporting “resubmitted” and new contentions). So too, a movant arguing that the information contained in a draft EA is not “sufficiently similar” to the ER must support its motion adequately. A movant thus might provide a declaration containing expert statements describing specifically both what new information is contained in the draft EA and why that information provides a reasonable basis for concluding the EA adequately addresses the contention’s claims.

**RULES OF PRACTICE: CONTENTIONS (NEPA MIGRATION
TENET; CONTENTION OF OMISSION; CONTENTION OF
ADEQUACY)**

For purposes of challenging the application of the migration tenet, there is a distinction between what must be shown relative to a contention of adequacy versus a contention of omission.

**RULES OF PRACTICE: CONTENTIONS (NEPA MIGRATION
TENET; CONTENTION OF OMISSION)**

If the Staff maintains, and the contention’s sponsor does not contest, that the information allegedly missing from the ER is now present within the draft EA, the Staff does not need to provide any explanation about the adequacy of this new information given that a claimed omission is cured simply by providing

the information. The Staff having supplied the missing information, if the contention's sponsor believed the information provided to rectify the omission was inadequate, it was the contention's sponsor's responsibility to replace or amend its contention.

RULES OF PRACTICE: CONTENTIONS (SCOPE)

The Commission has acknowledged that, in the appropriate circumstances, a board may define the scope of a contention in light of the foundational support that leads to its admission. *See Crow Butte Resources, Inc.* (North Trend Expansion Project), CLI-09-12, 69 NRC 535, 553 (2009); *see also Ross*, LBP-13-10, 78 NRC at 138.

MEMORANDUM AND ORDER (Granting in Part and Denying in Part Motion to Deny Migration of Environmental Portion of Contention 2)

By motion dated January 26, 2018, the Nuclear Regulatory Commission (NRC) Staff has asked the Licensing Board to deny the migration of the environmental portion of the sole remaining admitted contention of intervenor Oglala Sioux Tribe (OST). *See* NRC Staff's Motion to Deny Migration of Environmental Portion of Contention 2 (Jan. 26, 2018) at 1 [hereinafter Staff Motion]. That contention, admitted as "OST Contention 2: Failure to Include Adequate Hydrogeological Information to Demonstrate Ability to Contain Fluid Migration," questions the sufficiency of the May 2012 application of Crow Butte Resources, Inc. (CBR), for authorization to operate a satellite in situ uranium recovery (ISR) facility within the Marsland Expansion Area (MEA), in particular the project area's geological setting and the MEA's potential effects on adjacent surface water and groundwater resources. *See* LBP-13-6, 77 NRC 253, 294-95, 306 (2013), *aff'd*, CLI-14-2, 79 NRC 11 (2014). According to the Staff, to the extent this contention challenges the environmental report (ER) portion of the CBR May 2012 application, the Board should not permit it to migrate forward as contesting the Staff's recently issued draft environmental assessment (EA). *See* Staff Motion at 7. Applicant CBR and intervenor OST have provided responses supporting and opposing, respectively, the Staff's motion. *See* [CBR] Response to NRC Staff Motion to Deny Migration of Contention 2 (Feb. 5, 2018) [hereinafter CBR Response]; [OST] Response to NRC Staff's Motion to Deny Migration of Contention 2 (Feb. 5, 2018) [hereinafter OST Response].

For the reasons set forth below, we grant in part and deny in part the Staff's motion to preclude migration of OST Contention 2, finding that only one aspect

of the contention will not be subject to further consideration in this proceeding as an environmental-based challenge.

I. BACKGROUND

On May 16, 2012, CBR filed an application with the agency to amend the existing ISR license for its Crow Butte ISR site to permit CBR to construct and operate a satellite ISR facility in the MEA, which is located in Dawes County, Nebraska. On January 29, 2013, OST submitted a request for hearing and petition to intervene in this proceeding, *see* Petition to Intervene and Request for Hearing of [OST] (Jan. 29, 2013) [hereinafter OST Petition], and the Board subsequently found that OST had standing to intervene and had proffered two admissible contentions, *see* LBP-13-6, 77 NRC at 304-05. On October 22, 2014, the Board granted the Staff's motion for summary disposition of OST Contention 1, leaving OST Contention 2 as the only contention extant in this matter.¹ *See* Licensing Board Memorandum and Order (Ruling on Motion for Summary Disposition Regarding [OST] Contention 1) (Oct. 22, 2014) at 2 (unpublished) [hereinafter Board Summary Disposition Ruling].

As admitted by the Board, Contention 2 reads:

OST Contention 2: Failure to Include Adequate Hydrogeological Information to Demonstrate Ability to Contain Fluid Migration

The application fails to provide sufficient information regarding the geological setting of the area to meet the requirements of 10 C.F.R. § 40.31(f); 10 C.F.R. § 51.45; 10 C.F.R. § 51.60; 10 C.F.R. Part 40, Appendix A, Criteria 4(e) and 5G(2); the National Environmental Policy Act; and NUREG-1569 section 2.6. The application similarly fails to provide sufficient information to establish potential effects of the project on the adjacent surface and ground-water resources, as required by 10 C.F.R. § 51.45, NUREG-1569 section 2.7, and the National Environmental Policy Act.

LBP-13-6, 77 NRC at 306. In brief, referencing both agency safety and environmental prescripts, Contention 2 embodies concerns “posing several complex technical issues” involving the adequacy of and, in one instance, a complete omission from, the application's “hydrogeologic characterization of the MEA site.” *Id.* at 294-95.

¹OST Contention 1 challenged the CBR ER's historical and cultural resources review of the MEA site. *See* LBP-13-6, 77 NRC at 286. The Staff's dispositive motion contested the contention's continuing viability in light of the Staff's June 2014 issuance of the portion of its draft EA addressing historical and cultural resources issues relating to the MEA facility. *See* Board Summary Disposition Ruling at 8-9.

To keep pace with the evolving nature of the Staff's safety and environmental review schedules for this proceeding, the Board has issued a series of scheduling orders advising the parties of associated filing deadlines, including those relating to the submission of new/amended contentions and migration declarations.² Most recently, in April 2017 we issued a revised scheduling order that, based on a Staff representation that its draft EA for the MEA facility would be issued in toto in mid-December 2017, set a January 16, 2018 deadline for the filing of new or amended draft EA-associated contentions and/or a migration declaration regarding Contention 2. *See* Licensing Board Memorandum and Order (Revised General Schedule) (Apr. 20, 2017) app. A, at 1 (unpublished). Thereafter, on December 11, 2017, the Staff notified the Board and the parties that the Staff's draft EA for the MEA was publicly available for review in the agency's ADAMS document database system.³ *See* Letter from Marcia J. Simon, NRC Staff Counsel, to Licensing Board (Dec. 11, 2017) at 1. This was followed by the December 15, 2017 *Federal Register* publication of the Staff's finding of no significant impact (FONSI) for the MEA. *See* Draft [EA] and Draft [FONSI]; Notice of Availability and Request for Comments, 82 Fed. Reg. 59,665 (Dec. 15, 2017).

Observing that the January 16 deadline passed without OST filing either a new or amended contention motion based on the draft EA or a migration declaration for Contention 2, on January 26, 2018, the Staff filed a motion to deny migration of the environmental portion of Contention 2. *See* Staff Motion at 1. On February 5, 2018, CBR filed a response to the Staff's motion in which it supported the dismissal of Contention 2 as moot. *See* CBR Response at 1. That same date, OST filed its response opposing the Staff's motion, arguing that because "[t]here is no clearer picture of the [MEA] hydrology with the publication of the EA than there was in CBR's ER," the Board should deny the Staff's motion and Contention 2 should migrate. OST Response at 2.

² *See, e.g.*, Licensing Board Memorandum and Order (Revised General Schedule) (July 26, 2016) at 2 & app. A (unpublished); Licensing Board Memorandum and Order (Revised General Schedule) (Feb. 11, 2016) at 2-5 & app. A (unpublished) [hereinafter February 2016 Order]; Licensing Board Memorandum and Order (Revised General Schedule) (Apr. 30, 2014) at 2-3 & app. A (unpublished); Licensing Board Memorandum and Order (Initial Prehearing Conference and Scheduling Order) (June 14, 2013) at 5-6 & app. A (unpublished).

³ That issuance incorporated the historical and cultural resources portion of the EA previously issued for comment in 2014. *Compare* [CBR] Proposed [MEA], NRC Documentation of [National Historic Preservation Act] Section 106 Review (Draft Cultural Resources Sections of [EA]) (June 25, 2014) (ADAMS Accession No. ML14176B129), *with* Office of Nuclear Material Safety and Safeguards (NMSS), NRC, Draft [EA] for the [MEA] License Amendment Application at 3-65 to -76, 4-36 to -38, 5-8 to -12 (Dec. 2017) (ADAMS Accession No. ML17334A870) [hereinafter Draft EA].

II. ANALYSIS

A. Standards Governing Contention Migration

The Commission has recognized that a contention challenging an applicant's ER generally may be viewed by a board as a challenge to the Staff's subsequently issued National Environmental Policy Act (NEPA)-related environmental review documents. See *Louisiana Energy Services, L.P.* (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 84 (1998). This migration tenet, as it has been labeled, allows a previously admitted contention challenging an applicant's ER to be construed as a challenge to a later-issued Staff environmental review document (such as an EA) without requiring the contention's proponent to file a new or amended contention. See *Crow Butte Resources, Inc.* (In Situ Leach Facility, Crawford, Nebraska), CLI-15-17, 82 NRC 33, 42 n.58 (2015). A board, however, need only permit migration of an admitted contention "where the information in the Staff's environmental review document is 'sufficiently similar' to the material in the applicant's environmental report." *Strata Energy, Inc.* (Ross In Situ Uranium Recovery Project), CLI-16-13, 83 NRC 566, 570 n.17 (2016) (quoting *Strata Energy, Inc.* (Ross In Situ Recovery Uranium Project), LBP-13-10, 78 NRC 117, 133 (2013), *petition for review denied*, CLI-16-13, 83 NRC at 601), *petition for review denied sub nom. Nat. Res. Def. Council v. NRC*, 879 F.3d 1202, 1206-07 (D.C. Cir. 2018). Thus, migration is appropriate so long as the draft EA's "analysis or discussion at issue is essentially *in para materia* with the ER analysis or discussion that is the focus of the contention." *Southern Nuclear Operating Co.* (Early Site Permit for Vogtle ESP Site), LBP-08-2, 67 NRC 54, 63-64 (2008).

These requirements notwithstanding, the proponent of the contention is not required to resubmit the contention if it maintains the contention properly will migrate. See *Ross*, LBP-13-10, 78 NRC at 143 n.15. "[A] contention's sponsor may choose not to make any submission regarding an admitted ER-based environmental contention it believes properly will migrate and can simply await an applicant or Staff filing challenging the contention's continued viability in light of the Staff's environmental document." *Id.*

The Commission's rules of practice provide that the proponent of a motion has the burden of proof. See 10 C.F.R. § 2.325. Accordingly, when a motion challenging contention migration is filed, the movant has the burden of proof to show that migration should not be permitted. Such a motion also must "state with particularity the grounds" upon which relief is sought, and "be accompanied by any affidavits or other evidence relied on." *Id.* § 2.323(b). More specifically, to meet its burden the proponent of a motion to deny migration must (1) detail what new information or analysis is included in the Staff's environmental review document; and (2) explain why that information or analysis is relevant to the

deficiencies challenged in the contention and provides a reasonable basis for concluding that those deficiencies have been adequately addressed.

Moreover, in applying the migration tenet, consideration also must be given to the case law that distinguishes between a contention of omission and a contention of adequacy. *See, e.g., Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-28, 56 NRC 373, 382-83 (2002) (“There is, in short, a difference between contentions that merely allege an ‘omission’ of information and those that challenge substantively and specifically how particular information has been discussed in a license application.”). If a contention is one of omission — for instance, challenging an absence of information in an ER — and new licensing documents are provided that supply such information, the previous contention loses its efficacy and the adequacy of the new information should become the focus of concern in that “new claims must be raised in a new or amended contention.” *Id.* at 382; *see also id.* at 383 (“[A] significant change in the nature of the purported NEPA imperfection, from one focusing on comprehensive information omission to one centered on a deficient analysis of subsequently supplied information, warrants issue modification by the complaining party.” (quoting *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-02-2, 55 NRC 20, 30 (2002))). The migration tenet thus may not be used to change the basic form of a contention from a contention of omission to one of adequacy. *See Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-01-23, 54 NRC 163, 172 n.3 (2001).

B. Efficacy of Staff’s Motion to Deny Migration

Although the Board requested that OST submit a migration declaration regarding Contention 2 by the deadline for submitting new/amended contentions,⁴ *see* February 2016 Order at 4-5, consistent with agency case law, OST’s failure to do so is not, in and of itself, a reason for the Board to refuse to allow the environmental portion of Contention 2 to migrate as a challenge to the Staff’s draft EA.⁵ *See Ross*, LBP-13-10, 78 NRC at 143 n.15. At the same time, as

⁴ As was noted in our February 2016 order, a migration declaration submitted by an admitted contention’s sponsor, whether alone or in conjunction with a new/amended contention motion, provides an opportunity for the sponsor to avoid any doubt as to its position on the status of the contention. *See* February 2016 Order at 5.

⁵ That being said, in its response OST declared that it was “surprised” by the January 16, 2018 date for filing such a declaration, or any new or amended contentions, due to the “conflicting date” for filing comments on the Staff’s EA. OST Response at 1. Putting aside the fact that the date for making such filings in this adjudication has been established in a series of orders going back

(Continued)

discussed above, if the Staff or the applicant maintains that the migration tenet is not applicable, it can request that the Board deny migration of the contention, as the Staff has done here. For such a motion to succeed, however, the moving party has the burden of establishing with specificity that migration is not appropriate because the draft EA is not substantially similar to the ER. And to make that showing, the moving party must establish where and how the draft EA diverges from the ER, and why that divergence makes the environmental portion of Contention 2 no longer viable.

In this instance, the Staff contends that the draft EA contains new information and analysis relating to Contention 2 that are not sufficiently similar to the information and analysis in the applicant's ER. *See* Staff Motion at 1. In our determination admitting Contention 2, the Board concluded that OST was challenging ER sections 3.4.3.2 and 3.4.3.3 as providing an inadequate discussion of the project's potential impact on surface water and groundwater resources. *See* LBP-13-6, 77 NRC at 293. In this regard, the Board found that OST supported its contention by alleging there were four specific deficits in the application:

(1) the descriptions of the affected environment are insufficient "to establish the potential effects of the proposed [ISR] operation on the adjacent surface water and ground water resources"; (2) "a description of the 'effective porosity, hydraulic porosity, hydraulic conductivity, and hydraulic gradient' of site hydrogeology," is absent along with "other information relative to the control and prevention of excursions"; (3) "an acceptable conceptual model of site hydrology adequately supported by the data presented in the site characterization" has not been adequately developed to demonstrate "with scientific confidence that the area hydrogeology, including horizontal and vertical hydraulic conductivity, will result in the confinement of extraction fluids and expected operational and restoration performance"; and (4) the ER contains "unsubstantiated assumptions as to the isolation of the aquifers in the ore-bearing zones."

Id. at 289 (quoting OST Petition at 17-18 (quoting NMSS, NRC, Standard Review Plan for In Situ Leach Uranium Extraction License Applications, NUREG-1569, at 2-20 to -21 (June 2003) [hereinafter NUREG-1569])). The Staff now contends that because the draft EA contains new and relevant information relative to the OST concerns embodied in Contention 2, the environmental portion of that contention should not migrate. *See* Staff Motion at 1.

In support of its motion, the Staff provides several examples of new information in the draft EA. *See id.* at 5-6. The Staff points the Board to five sections

to 2013, the most recent of which was issued in April 2017, *see supra* note 2 and accompanying text, OST should now be aware that the upcoming date for such submissions by a party to this adjudication relative to the Staff's safety evaluation report (SER) and final EA is independent of any deadlines that may be set by the Staff for general comments on these reports by the public.

of the draft EA that the Staff argues contain “new information and analysis in several areas related to confinement and the ability to contain production fluids.” *Id.* at 5. CBR also specifies several sections that it maintains incorporate “new information and analysis pertinent to the four alleged deficiencies identified by the Board that [go] beyond what had been presented” in the ER. CBR Response at 4-5. In contrast, OST argues that “the EA merely parrots CBR’s data that it provided in the ER, especially regarding the discussion of whether area hydrogeology will result in confinement of mining fluids” and “provides no discussion whatsoever regarding . . . the data collected during Pump Test 8, that appears, at best, inconclusive.” OST Response at 2.

As the proponent of a motion to deny migration, the Staff falls short of meeting its burden. To prevail, it is incumbent on the movant to plead its motion with specificity and adequately support all points required for a board to grant the motion. *See, e.g., U.S. Department of Energy (High-Level Waste Repository), LBP-08-5, 67 NRC 205, 209-10* (holding that a proponent of a motion seeking an order striking a discovery certification bore the burden “of supporting all points required for such an order”), *aff’d*, *CLI-08-22, 68 NRC 355, 358* (2008). In the context of a motion to deny migration of a contention, the Staff must do more than simply point the board to sweeping sections of the draft EA as new and relevant to the admitted contention. Instead, the Staff must adequately explain (1) why those sections in the draft EA are not substantially similar to the analysis and discussion contained in the ER; and (2) why the new analysis and discussion provide a reasonable basis for concluding that the deficiencies in the ER challenged by the admitted contention have been adequately addressed, aside from the bare fact that it is new information.

While the Staff in its motion and CBR in its response provided examples of sections that may contain new information, neither party’s pleading met the required level of specificity and analysis. It is not the Board’s responsibility to search through the Staff’s lengthy and technically dense draft EA to determine whether the information contained therein would meet the standard to prevent migration. *See FirstEnergy Nuclear Operating Co. (Davis-Besse Nuclear Power Station, Unit 1), CLI-12-8, 75 NRC 393, 404 n.67* (2012) (“[N]either [the Commission] nor the Board is obliged to look through lengthy documents for information on which a litigant relies.”).

Moreover, it is not enough to indicate, as both the Staff and CBR do in their submissions, that the information is “new and different” so as to prevent migration of a contention of adequacy. *See, e.g., Staff Motion at 5, 6; CBR Response at 5.* As the movant, the Staff had the burden of pointing out exactly what allegedly new information or analysis is contained in the draft EA, and how exactly that new information or analysis provides a reasonable basis for concluding the information adequately addresses one or more of the four ER deficits challenged by Contention 2 such that a new/amended contention is

required. *See Fansteel, Inc.* (Muskogee, Oklahoma Site), CLI-03-13, 58 NRC 195, 204 (2003) (affirming that a petitioner has an obligation not just to refer generally to voluminous documents, but to provide analysis and supporting evidence as to why particular sections of those documents provide a basis for a contention); LBP-13-6, 77 NRC at 285 (noting petitioner required to explain the significance of any information contained in a document provided as the basis for the contention). The Staff having failed to do so in its pleading, the Board will not “hunt for such evidence” that the draft EA is not substantially similar to the ER, “plumb the record” for arguments that there is a reasonable basis to conclude that the new information adequately addresses the deficits, or generally “do counsels’ work for them.” *Nat. Res. Def. Council*, 879 F.3d at 1209.

In this regard, the Staff points to draft EA section 4.3.2.2 as a part of its review document that is not substantially similar to the ER, asserting that this section “discusses an assessment of potential contamination of an irrigation well within the MEA license area based on a hypothetical ISR well casing leak.” Staff Motion at 5. The Staff, however, fails to identify to which of the four contention-identified deficits this section relates, much less explain how adding this discussion would remedy the ER’s challenged deficits. Likewise, the Staff references draft EA section 3.2.2.2 as “an independent review of literature related to reported faults in the area of the MEA, as well as the Staff’s conclusions as to why the reported faults, even if they exist, will not contribute to impacts on surface or groundwater.” *Id.* at 5-6. Although this portion of the motion tells the Board the general subject matter of the cited section of the draft EA, the Staff nonetheless fails to identify how the new information is relevant to the challenges posed by Contention 2 or to provide a reasonable basis for concluding that the deficiencies outlined in Contention 2 have been adequately addressed. So too, the Staff claims that draft EA sections 3.2.2.2, 3.3.2.3, and 3.3.2.5 all “discuss CBR’s commitment . . . to perform additional aquifer pumping tests in all mine units not covered by the regional pump test described in the 2012 ER.” *Id.* at 6. Yet, once again the motion does not provide the Board with any explanation as to why this discussion alleviates the deficits that OST alleges. Certainly, the Staff could have provided the Board with a technical description or an affidavit explaining the Staff’s position as to why this information was new, how this material addressed the issues raised in Contention 2, and why this information provided a reasonable basis for concluding those issues were adequately addressed such that a new or amended contention was warranted.

Not dissimilarly, when an intervenor seeks to admit a new or amended contention, the agency’s rules of practice require, among other things, that the filing be based on information that is “materially different” from that which was previously available. 10 C.F.R. § 2.309(c)(1)(ii). In arguing that this requirement has been satisfied, we reasonably may expect the petitioner will provide appro-

appropriate affidavits, declarations, or other information explaining to the Board why the subsequent licensing documents contain new information that is materially different such that the petitioner could not have proffered the contention earlier in the proceeding. *See Ross*, LBP-13-10, 78 NRC at 134 (noting intervenors provided multiple declarations with expert statements supporting “resubmitted” and new contentions). So too, a movant arguing that the information contained in a draft EA is not “sufficiently similar” to the ER must support its motion adequately. The Staff thus might have provided a declaration containing expert statements describing specifically both what new information is contained in the draft EA and why that information provides a reasonable basis for concluding the EA adequately addresses OST claims that the ER is deficient in its description of the affected environment, has an inadequately developed model of site hydrogeology, and makes unsubstantiated assumptions regarding aquifer isolation at the MEA. Instead, the Staff inappropriately left it to the Board to ferret out and supply this technical analysis.⁶

Additionally, however, as we noted above, for purposes of challenging the application of the migration tenet, there is a distinction between what must be shown relative to a contention of adequacy versus a contention of omission. While Contention 2 is generally a contention of adequacy, one of the four OST-identified concerns, as outlined in LBP-13-6, was framed as an omission. In this regard, we observed the second OST deficit alleged that “‘a description of the “effective porosity, hydraulic conductivity, and hydraulic gradient” of site hydrogeology,’ is *absent*” from the ER. LBP-13-6, 77 NRC at 289 (emphasis added) (quoting OST Petition at 17-18 (quoting NUREG-1569, at 2-20)). Because this aspect of the contention involves an omission, if the missing information was provided in subsequent licensing documents, it was incumbent upon OST to file a new or amended contention within the specified deadline challenging the adequacy of any discussion of these three hydrogeological characteristics in the draft EA. In its motion, the Staff states that section 3.3.2.1 contains “information on effective porosity, hydraulic conductivity, and hydraulic gradient (information asserted to be lacking in the 2012 ER).” Staff Motion at 6 & n.24 (citing Draft EA at 3-39 to -45). The Staff thus maintains, and OST does not contest, that the information allegedly missing from the ER is now present within the draft EA. Moreover, the Staff does not need to provide any explanation about

⁶ While CBR’s response provides some further detail, even briefly explaining to which deficits the new information might relate, it also falls short. *See, e.g.*, CBR Response at 4-5. CBR’s response, like the Staff’s motion, contains no explanation as to why the allegedly new information provides a reasonable basis for concluding that the deficiencies challenged in Contention 2 have been adequately addressed. Like the Staff, CBR simply states that there is new information and omits any analysis of why this new information is adequate to address the ER deficiencies alleged in Contention 2.

the adequacy of this new information given that a claimed omission is cured simply by providing the information.

The Staff having supplied the missing information, if OST believed the information provided to rectify the omission was inadequate, it was OST's responsibility to replace or amend its contention, which it did not do. We therefore grant the Staff's motion to deny migration as to the environmental portion of the second deficit identified in LBP-13-6. But as to the other aspects of the contention, for the reasons provided above we must reject the remainder of the Staff's migration denial request.

III. DEFINING THE SCOPE OF CONTENTION 2 AS MIGRATED

The Commission has acknowledged that, in the appropriate circumstances, a board may define the scope of a contention in light of the foundational support that leads to its admission. *See Crow Butte Resources, Inc.* (North Trend Expansion Project), CLI-09-12, 69 NRC 535, 553 (2009); *see also Ross*, LBP-13-10, 78 NRC at 138. Given the complexity and technical nature of both the environmental and safety aspects of this contention,⁷ we consider it important that the Board continue, in appropriate instances, to clarify the scope of Contention 2 with as much specificity as possible.

Because our rulings in this decision provide such an opportunity, we now view the migrated contention to provide as follows:

OST Contention 2: Failure to Include Adequate Hydrogeological Information to Demonstrate Ability to Contain Fluid Migration

The application and draft environmental assessment fail to provide sufficient information regarding the geological setting of the area to meet the requirements of 10

⁷ Although CBR previously characterized Contention 2 as a "hybrid" contention having both safety and environmental aspects, *see* Tr. at 23, CBR now questions the Staff's classification of Contention 2 in this manner, asserting that "[t]he contention is clearly and unambiguously an environmental contention" that not only should not migrate but should be dismissed in its entirety, CBR Response at 5 n.15, with the result that this proceeding would be terminated before the Board. Nonetheless, given the contention's references to both NEPA and 10 C.F.R. Part 40, Appendix A technical criteria, the hybrid nature of this contention seems clear.

Perhaps spurring CBR in this regard is its recognition that, as a general matter, the issuance of the Staff's SER does not trigger the migration tenet. *See id.* at 6 n.15 (citing *Ross*, LBP-13-10, 78 NRC at 132 n.7 (noting that because the application, not the Staff's safety review, is the focus of any admitted safety contention, the Staff's SER issuance generally does not trigger the migration tenet)). Be that as it may, whether, and to what degree, that principle might apply to a safety-based contention of omission, particularly in light of any license application amendments or applicant responses to Staff requests for additional information (RAIs), is a matter we need not address at this juncture.

C.F.R. Part 40, Appendix A, Criteria 4(e) and 5G(2); the National Environmental Policy Act; and NUREG-1569 section 2.6. The application and draft environmental assessment similarly fail to provide sufficient information to establish potential effects of the project on the adjacent surface and ground-water resources, as required by NUREG-1569 section 2.7, and the National Environmental Policy Act.⁸

More specifically, the scope of the safety and environmental concerns encompassed by this contention include the following: (1) the adequacy of the descriptions of the affected environment for establishing the potential effects of the proposed MEA operation on the adjacent surface water and groundwater resources; (2) exclusively as a safety concern, the absence in the applicant's technical report, in accord with NUREG-1569 section 2.7, of a description of the effective porosity, hydraulic porosity, hydraulic conductivity, and hydraulic gradient of site hydrogeology, along with other information relative to the control and prevention of excursions; (3) the failure to develop, in accord with NUREG-1569 section 2.7, an acceptable conceptual model of site hydrology that is adequately supported by site characterization data so as to demonstrate with scientific confidence that the area hydrogeology, including horizontal and vertical hydraulic conductivity, will result in the confinement of extraction fluids and expected operational and restoration performance; and (4) whether the draft EA contains unsubstantiated assumptions as to the isolation of the aquifers in the ore-bearing zones.

IV. CONCLUSION

For the reasons set forth above, having determined that, other than with respect to the environmental aspect of the contention regarding the omission of a description of effective porosity, hydraulic conductivity, and hydraulic gradient, the Staff has failed to carry its burden to establish that the migration of Contention 2 to a challenge to the Staff's draft EA should be denied, we grant the Staff's motion to deny migration only as to the environmental aspects of the omission portion of the contention.

For the foregoing reasons, it is this 16th day of March 2018, ORDERED, that the NRC Staff's January 26, 2018 motion to deny migration of the environmental portion of OST Contention 2 is (1) *granted* as to the environmental portion of

⁸The original Contention 2 contained references to 10 C.F.R. §§ 40.31(f), 51.45, and 51.60. These provisions, however, describe the requirements applicable to an applicant's ER and can be removed because they are no longer relevant given the admitted ER-related portions of Contention 2 migrate as challenges to the Staff's draft EA. See *Ross*, LBP-13-10, 78 NRC at 134 n.10.

the deficit 2 aspect of the contention; and (2) *denied* as to all other aspects of the contention.

THE ATOMIC SAFETY AND
LICENSING BOARD

G. Paul Bollwerk, III, Chairman
ADMINISTRATIVE JUDGE

Dr. Richard E. Wardwell
ADMINISTRATIVE JUDGE

Dr. Thomas J. Hirons
ADMINISTRATIVE JUDGE

Rockville, Maryland
March 16, 2018

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Kristine L. Svinicki, Chairman
Jeff Baran
Stephen G. Burns

In the Matter of

**Docket Nos. 52-040-COL
52-041-COL**

**FLORIDA POWER & LIGHT
COMPANY
(Turkey Point Nuclear Generating
Units 6 and 7)**

April 5, 2018

MANDATORY HEARINGS

Section 189a. of the Atomic Energy Act of 1954, as amended (AEA), requires that the Commission hold a hearing on each application to construct a nuclear power plant, regardless of whether an interested member of the public requests a hearing on the application.

MANDATORY HEARINGS, SAFETY ISSUES

With respect to safety matters, the Commission must determine whether: the applicable standards and regulations of the AEA and the Commission's regulations have been met; (2) any required notifications to other agencies or bodies have been duly made; (3) there is reasonable assurance that the facility will be constructed and will operate in conformity with the licenses, the provisions of the AEA, and the Commission's regulations; (4) the applicant is technically and financially qualified to engage in the activities authorized by the licenses; and (5) issuance of the licenses will not be inimical to the common defense and security or to the health and safety of the public.

MANDATORY HEARINGS, NATIONAL ENVIRONMENTAL POLICY ACT

With respect to environmental matters, the Commission must: (1) determine whether the requirements of NEPA section 102(2)(A), (C), and (E), and the applicable regulations in 10 C.F.R. Part 51 (the NRC regulations implementing NEPA), have been met; (2) independently consider the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken; (3) determine, after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, whether the combined license should be issued, denied, or appropriately conditioned to protect environmental values; and (4) determine whether the NEPA review conducted by the Staff has been adequate.

MANDATORY HEARINGS

The Commission does not review Florida Power & Light's application *de novo*; rather, its inquiry is whether the Staff's review was sufficient to support these findings.

MANDATORY HEARINGS

All safety and environmental matters relevant to the combined license application, except those resolved in the contested proceeding, are subject to the Commission's review in the uncontested proceeding.

COMBINED LICENSE APPLICATIONS, EXEMPTIONS AND DEPARTURES

Where a combined license applicant references a certified design, changes to the design may be made in the combined license if proposed as a departure from the certified design. Certain departures may be made without prior Commission approval. But departures that involve a change to the design as described in the rule certifying the design require an exemption from our regulations. The Staff may approve an exemption where it finds that the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption. In addition, the Staff must determine that the special circumstances outweigh any decrease in safety resulting from the reduction in standardization that may result from the exemption. The requirements

that combined license applicants must meet to obtain an exemption from NRC regulations are found at 10 C.F.R. § 52.93.

SITE SELECTION, DEFENSE-IN-DEPTH POLICY

Our rules direct that “[r]eactor sites should be located away from very densely populated centers.” While sites in areas of low population density are generally preferred, a particular site not in an area of low density but “located away” from a high-density population may still be acceptable. “Locating reactors away from densely populated centers is part of the NRC’s defense-in-depth philosophy and facilitates emergency planning and preparedness, as well as reduces potential doses and property damage in the event of a severe accident.”

NATIONAL ENVIRONMENTAL POLICY ACT, ENDANGERED SPECIES ACT

Under the Endangered Species Act, any action authorized by the NRC must not jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify the critical habitat of such a species. The NRC must consult with the Fish and Wildlife Service or the National Marine Fisheries Service, as appropriate, on activities that may affect a listed species or a species proposed to be listed.

NATIONAL ENVIRONMENTAL POLICY ACT

NEPA section 102(2)(A) requires agencies to use “a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts” in decision-making that may impact the environment.

NATIONAL ENVIRONMENTAL POLICY ACT

NEPA section 102(2)(C) requires the Commission to assess the relationship between short-term uses and long-term productivity of the environment (including consideration of the benefits of operating the new units), to consider alternatives, and to describe the unavoidable adverse environmental impacts and the irreversible and irretrievable commitments of resources associated with the proposed action.

NATIONAL ENVIRONMENTAL POLICY ACT

NEPA section 102(2)(E) calls for agencies to study, develop, and describe appropriate alternatives. The alternatives analysis is the “heart of the environmental impact statement.”

MEMORANDUM AND ORDER

On December 12, 2017, we held a hearing on Florida Power & Light Company’s (FPL) application for combined licenses (COLs) to construct and operate two new nuclear power units at the existing Turkey Point site in Miami-Dade County, Florida. In this uncontested proceeding, we consider whether the review of the application by the NRC Staff has been adequate to support the findings set forth in 10 C.F.R. §§ 52.97(a) and 51.107(a). As discussed below, we conclude that the Staff’s review was sufficient to support the regulatory findings, and we authorize issuance of the combined licenses.

I. BACKGROUND

A. Proposed Action

In June 2009, FPL applied to build two AP1000 advanced passive pressurized water reactor units at the Turkey Point site.¹ The proposed Units 6 and 7 would be built on the site that contains the existing Turkey Point Units 3 and 4.² The site also has two natural gas/oil steam electric generating units (Units 1 and 2) and one natural gas, combined-cycle, steam electric generating unit (Unit 5).³

Consistent with 10 C.F.R. Part 52, Appendix D, FPL’s combined license application references Revision 19 of the AP1000 certified design.⁴ The first

¹ Florida Power & Light Company; Acceptance for Docketing of an Application for Combined License for Turkey Point Units 6 & 7 Nuclear Power Plants, 74 Fed. Reg. 51,621 (Oct. 7, 2009).

² Ex. NRC-008, Florida Power and Light Company, Application for Combined Licenses for Turkey Point Units 6 and 7, Part 1, General and Financial Information, rev. 8 (Aug. 2016), at 1 (ADAMS accession no. ML17348A665) (Application).

³ *Id.* Units 1 and 2 have been converted to operate in synchronous condenser mode, which helps stabilize and optimize grid performance rather than generate power to serve load. Tr. at 32 (Mr. Franzone); Ex. NRC-007, “Environmental Impact Statement for Combined Licenses for Turkey Point Nuclear Plant, Units 6 and 7” (Final Report), NUREG-2176, vols. 1-4 (Oct. 2016), at 2-1 (ML17348A663) (Final EIS).

⁴ See Ex. NRC-008, Application, at 3; see also Westinghouse AP1000 Design Control Document, rev. 19 (June 20, 2011) (ML11171A500 (package)). The certified design is codified in 10 C.F.R. Part 52, Appendix D, “Design Certification Rule for the AP1000 Design.”

combined license application for a given design is designated the “reference COL” application (RCOLA) and later applications referencing the same design are designated “subsequent COL” applications (SCOLA). Where the Staff has already resolved an issue with respect to the RCOLA, the Staff’s review of the same issue (a “standard issue”) in an SCOLA consists of confirming that the information is identical in both applications and that there are no site-specific issues that require further consideration. The application for Vogtle Units 3 and 4 was designated as the RCOLA for the AP1000 design; the Turkey Point application is therefore considered an SCOLA.⁵ The Staff’s safety review did not address issues resolved in connection with the AP1000 design certification, except where FPL sought exemptions or departures from the certified design.⁶ The Turkey Point application is the only remaining application referencing the AP1000 design currently before the Commission.⁷

FPL’s application does not reference an early site permit. Therefore, all site characteristics, including site geology, hydrology, seismology, and man-made hazards, as well as the potential environmental impacts of the project, were considered during the review of the combined license application.

The Staff spent approximately 89,000 hours on the safety and environmental reviews of the application.⁸ Over the course of its review, the Staff conducted approximately 80 public meetings and teleconferences.⁹ FPL responded to 516 requests for additional information, 340 of which were associated with the safety review and 176 of which were associated with the environmental review.¹⁰

Staff from across the agency contributed to the Office of New Reactors’ technical review of FPL’s application.¹¹ The U.S. Army Corps of Engineers (Corps) participated with the Staff as a cooperating agency in preparing the environmental impact statement associated with the application under the terms

⁵ See Ex. NRC-001, “Staff Statement in Support of the Uncontested Hearing for Issuance of Combined Licenses for Turkey Point Units 6 and 7 (Docket Nos. 52-040 and 52-041),” Commission Paper SECY-16-0136 (Dec. 2, 2016), at 3-4 (ML17348A656) (Staff Information Paper).

⁶ Safety matters resolved at the design certification stage are generally excluded from our review of FPL’s combined license application. 10 C.F.R. § 52.63.

⁷ Tr. at 54 (Ms. Ordaz). The Commission has issued eight COLs for units referencing the AP1000 design. *Id.* (Ms. Ordaz). These units are Vogtle Electric Generating Plant, Units 3 and 4; Virgil C. Summer Nuclear Station, Units 2 and 3; Levy Nuclear Plant, Units 1 and 2; and William States Lee III Nuclear Station, Units 1 and 2.

⁸ *Id.* at 51 (Ms. Ordaz). Contractors working in collaboration with the Staff contributed over 16,000 hours to support the safety and environmental reviews. *Id.* (Ms. Ordaz).

⁹ *Id.* (Ms. Ordaz).

¹⁰ *Id.* (Ms. Ordaz).

¹¹ *Id.* at 52 (Ms. Ordaz).

of an existing Memorandum of Understanding.¹² The Corps participated in site visits, consultations with other agencies, and development of the draft and final environmental impact statements.¹³ The National Park Service also participated in the environmental review as a cooperating agency under a Memorandum of Agreement and provided special expertise for the areas in and around the adjacent Biscayne and Everglades National Parks.¹⁴ Both the NRC and the Corps made the impact determinations in the Final Environmental Impact Statement (Final EIS).¹⁵

In addition, the Staff consulted with federal, state, local, and tribal organizations and governments concerning a variety of issues, including those arising under the National Environmental Policy Act of 1969 (NEPA), the National Historic Preservation Act (NHPA), and the Endangered Species Act.¹⁶ The Advisory Committee on Reactor Safeguards (ACRS), a committee of technical experts, provided us with an independent assessment of the safety aspects of FPL's application.¹⁷

B. Review Standards

Section 189a. of the Atomic Energy Act of 1954, as amended (AEA) requires that we hold a hearing on each application to construct a nuclear power plant, regardless of whether an interested member of the public requests a hearing on the application.¹⁸ With respect to safety matters, we must determine whether

- (1) the applicable standards and regulations of the AEA and the Commission's regulations have been met;

¹² *Id.* at 59 (Ms. Dixon-Herrity); Ex. NRC-007, Final EIS, at 1-1; *see* Memorandum of Understanding Between U.S. Army Corps of Engineers and U.S. Nuclear Regulatory Commission on Environmental Reviews Related to the Issuance of Authorizations to Construct and Operate Nuclear Power Plants (effective Sept. 12, 2008) (ML082540354).

¹³ Tr. at 60 (Ms. Dixon-Herrity).

¹⁴ *Id.* at 53 (Ms. Ordaz), 60 (Ms. Dixon-Herrity); Ex. NRC-007, Final EIS, at 1-3; *see* Memorandum of Agreement Between the U.S. Army Corps of Engineers, Jacksonville District, the U.S. National Park Service, Southeast Region, and the U.S. Nuclear Regulatory Commission, Office of New Reactors on the Environmental Review Related to the Issuance of Authorizations to Build and Operate Turkey Point Nuclear Plant, Units 6 and 7 (effective July 15, 2013) (ML12172A375).

¹⁵ Tr. at 60 (Ms. Dixon-Herrity); *see also* Ex. NRC-007, Final EIS, at 1-3.

¹⁶ Tr. at 52-53 (Ms. Ordaz); *see* Ex. NRC-007, Final EIS, apps. B & C.

¹⁷ Atomic Energy Act of 1954, as amended (AEA), § 182b., 42 U.S.C. § 2232(b); 10 C.F.R. §§ 1.13, 52.87; *see* Letter from Dennis C. Bley, ACRS, to Stephen G. Burns, NRC (Sept. 16, 2016) (ML16257A535) (generally recommending approval of the combined license application).

¹⁸ AEA § 189a., 42 U.S.C. § 2239(a).

- (2) any required notifications to other agencies or bodies have been duly made;
- (3) there is reasonable assurance that the facility will be constructed and will operate in conformity with the licenses, the provisions of the AEA, and the Commission's regulations;
- (4) the applicant is technically and financially qualified to engage in the activities authorized by the licenses; and
- (5) issuance of the licenses will not be inimical to the common defense and security or to the health and safety of the public.¹⁹

With respect to environmental matters, we must

- (1) determine whether the requirements of NEPA section 102(2)(A), (C), and (E), and the applicable regulations in 10 C.F.R. Part 51 (the NRC regulations implementing NEPA) have been met;
- (2) independently consider the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken;
- (3) determine, after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, whether the combined licenses should be issued, denied, or appropriately conditioned to protect environmental values; and
- (4) determine whether the NEPA review conducted by the NRC Staff has been adequate.²⁰

We do not review FPL's application *de novo*; rather, our inquiry is whether the Staff's review was sufficient to support these findings.²¹

C. Contested Proceeding

To provide context for the mandatory hearing, this section recounts a brief history of the contested proceeding, which spanned from 2010 to 2017 and involved both site-specific litigation and petitions affecting multiple dockets.

¹⁹ 10 C.F.R. § 52.97(a)(1).

²⁰ *Id.* § 51.107(a).

²¹ See, e.g., *Southern Nuclear Operating Co.* (Vogtle Electric Generating Plant, Units 3 and 4), CLI-12-2, 75 NRC 63, 74 (2012).

After the Staff accepted the combined license application for review, the NRC provided an opportunity to challenge the application in an adjudicatory hearing.²² Three petitions to intervene were filed at that time by (1) Mark Oncavage, Dan Kipnis, the Southern Alliance for Clean Energy, and the National Parks Conservation Association (collectively, the Joint Intervenors); (2) Citizens Allied for Safe Energy, Inc. (CASE); and (3) the Village of Pinecrest, a Florida municipality, which also requested, in the alternative, to participate as an interested local government under 10 C.F.R. § 2.315(c).²³ The Atomic Safety and Licensing Board granted a hearing to the Joint Intervenors and CASE.²⁴

Joint Intervenors' NEPA Contention 2.1 was admitted in part, and the Board held an evidentiary hearing in May 2017 on that contention.²⁵ Joint Intervenors challenged the Staff's conclusion that the environmental impacts from the operation of FPL's proposed deep injection wells would be "small" and claimed that four chemical constituents in the wastewater may adversely impact the groundwater if they migrate to the Upper Floridan Aquifer.²⁶ The Board resolved the contention in favor of the Staff.²⁷ The Board concluded that the Staff demonstrated "that the environmental impacts . . . will be 'small' because (1) the wastewater is unlikely to migrate to the Upper Floridan Aquifer; and (2) even if it did, the concentration of each of the four contaminants would be below the applicable United States Environmental Protection Agency (EPA) primary drinking water standard and, accordingly, would pose no known health risk."²⁸

CASE's Contentions 6 and 7 also were admitted in part. In Contention 6 CASE challenged the adequacy of FPL's consideration, in its environmental report (ER), of the environmental impacts of long-term onsite storage of low-level radioactive waste at proposed Units 6 and 7, and in Contention 7 CASE chal-

²² Florida Power & Light Company, Combined License Application for the Turkey Point Units 6 & 7, Notice of Hearing, Opportunity To Petition for Leave To Intervene and Associated Order Imposing Procedures for Access to Sensitive Unclassified Non-Safeguards Information and Safeguards Information for Contention Preparation, 75 Fed. Reg. 34,777 (June 18, 2010).

²³ [Joint Intervenors'] Petition for Intervention (Aug. 17, 2010); Citizens Allied for Safe Energy, Inc. [Revised] Petition to Intervene and Request for a Hearing (Aug. 17, 2010); Petition by the Village of Pinecrest, Florida, for Leave to Intervene in a Hearing on Florida Power & Light Company's Combined Construction and Operating License Application for Turkey Point Units 6 & 7, or in the Alternative, Participate as a Non-Party Local Government (Aug. 16, 2010).

²⁴ LBP-11-6, 73 NRC 149, 165 (2011). The Village of Pinecrest participated in the contested proceeding as an interested local government.

²⁵ LBP-17-5, 86 NRC 1, 5, 13 n.17 (2017).

²⁶ See LBP-16-3, 83 NRC 169, 186 (2016). Aspects of FPL's proposed use of deep well injection for liquid radioactive waste disposal not covered by the Board's ruling are discussed further in section II.B.1.b.

²⁷ LBP-17-5, 86 NRC at 5.

²⁸ *Id.* Joint Intervenors did not seek review of the Board's decision.

lenged the application's discussion of safety matters arising from such storage.²⁹ After FPL revised its application to address these issues, the Board dismissed both contentions.³⁰ Subsequently, the Board denied newly proffered contentions from CASE related to low-level radioactive waste storage and also dismissed CASE from the proceeding.³¹

In April 2011, Joint Intervenors, CASE, and the Village of Pinecrest joined several petitioners across multiple dockets in the filing of a petition to suspend reactor licensing and rulemaking decisions and for other relief in light of the March 2011 Fukushima Dai-ichi accident in Japan.³² We denied the petitions in all but two respects: we granted the request for a safety analysis of the accident based on the NRC's plans for a short-term and long-term lessons-learned review, and we referred portions of the petition relating to pending design certification applications, including the AP1000 amendment, to the Staff as comments on the design certification rulemakings.³³

CASE later sought reconsideration of three contentions based, in part, on new information related to the Fukushima accident; CASE also submitted two new contentions based on recommendations made by the NRC's Fukushima Near-

²⁹ LBP-11-6, 73 NRC at 238, 243.

³⁰ Licensing Board Order (Granting FPL's Motions to Dismiss Joint Intervenors' Contention 2.1 and CASE's Contention 6 as Moot) (Jan. 26, 2012), at 3 (unpublished) (January 2012 Board Order); LBP-12-4, 75 NRC 213, 217 (2012) (granting FPL's motion for summary disposition of Contention 7). FPL's revised ER analyzed and discussed the four wastewater chemical constituents that were omitted from the previous version of the ER. January 2012 Board Order at 4. FPL also revised its application to provide its plan, if needed, for controlling radiation exposures from extended onsite storage of low-level radioactive waste. LBP-12-4, 75 NRC at 220.

³¹ LBP-12-7, 75 NRC 503, 504-05 (2012).

³² Emergency Petition to Suspend All Pending Reactor Licensing Decisions and Related Rulemaking Decisions Pending Investigation of Lessons Learned from Fukushima Daiichi Nuclear Power Station Accident (revised Apr. 18, 2011).

³³ *Union Electric Co. d/b/a Ameren Missouri* (Callaway Plant, Unit 2), CLI-11-5, 74 NRC 141, 150 n.19, 175-76 (2011). The Staff responded to these comments in the Statement of Considerations for the final rules. See AP1000 Design Certification Amendment; Final Rule, 76 Fed. Reg. 82,079, 82,081 (Dec. 30, 2011); "NRC Responses to Public Comments, Final Rule: Amendment to AP1000 Design Certification Rule, 10 CFR Part 52, Appendix D" (Dec. 2011), at 9 n.1 (ML113480018); see also Economic Simplified Boiling-Water Reactor Design Certification; Final Rule, 79 Fed. Reg. 61,944, 61,946 (Oct. 15, 2014). The NRC has since taken significant action to enhance the safety of U.S. reactors based on the lessons learned from the Fukushima accident. See, e.g., Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, EA-12-049 (Mar. 12, 2012) (ML12054A735); Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, EA-12-051 (Mar. 12, 2012) (ML12056A044). See generally <https://www.nrc.gov/reactors/operating/ops-experience/japan-dashboard.html> (last visited Mar. 19, 2018).

Term Task Force.³⁴ The Board denied CASE's requests.³⁵ At that time Joint Intervenor and CASE also joined petitioners from other dockets to file a new contention asserting that the Task Force's lessons-learned report had raised new and significant information concerning the environmental risks associated with nuclear power plants.³⁶ The Board rejected the motions.³⁷ Relatedly, in early 2014, several petitioners sought to suspend reactor licensing decisions pending the resolution of a petition for rulemaking concerning the environmental impacts of the expedited transfer of spent fuel from the spent fuel pool to dry cask storage. We denied the suspension petitions and provided direction on related requests.³⁸

In response to the D.C. Circuit's vacatur and remand of the agency's Waste Confidence Decision Update and Temporary Storage Rule in 2012, "placeholder" contentions were filed on multiple dockets, including this one, asserting that the agency could not issue licenses until it had resolved the deficiencies identified by the court. We granted the petitions in part — we suspended final licensing decisions until the court's remand was appropriately addressed and held

³⁴ Citizens Allied for Safe Energy, Inc. Motion For Reconsideration of Amended Contentions 1, 2 and 5 And New Contentions Following Fukushima Near-Term Task Force Recommendations (dated Aug. 11, 2011, filed Aug. 12, 2011). CASE had submitted the contentions, which pertained to emergency planning and climate-change-related sea-level rise, as part of its initial intervention petition.

³⁵ Order (Denying CASE's Motion to Reconsider Rejection of Amended Contentions and to Admit Two Newly Proffered Contentions, and Denying FPL's Request to Impose Remedial Measures on CASE) (Sept. 21, 2011), at 1-2 (unpublished); *see* LBP-11-15, 73 NRC 629 (2011).

³⁶ Motion to Admit New Contention Regarding the Safety and Environmental Implications of the Nuclear Regulatory Commission Task Force Report on the Fukushima Dai-ichi Accident (Aug. 11, 2011); Contention Regarding NEPA Requirement to Address Safety and Environmental Implications of the Fukushima Task Force Report (Aug. 11, 2011).

³⁷ LBP-11-33, 74 NRC 675, 677-78 (2011). The Commission also denied CASE's petition for rulemaking (filed by petitioners in multiple dockets) requesting that the NRC rescind its regulations that "reach generic conclusions about the environmental impacts of severe reactor and/or spent fuel pool accidents and therefore prohibit considerations of those impacts in reactor licensing proceedings." Environmental Impacts of Severe Reactor and Spent Fuel Pool Accidents; Petition for Rulemaking; Denial, 80 Fed. Reg. 48,235, 48,235 (Aug. 12, 2015); Rulemaking Petition to Rescind Prohibition Against Consideration of Environmental Impacts of Severe Reactor and Spent Fuel Pool Accidents and Request to Suspend Licensing Decision (Aug. 12, 2011).

³⁸ *See DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-14-7, 80 NRC 1, 10 (2014) (directing the Staff to deny the rulemaking petitioners' collateral request to suspend licensing decisions on all other pending proceedings and directing the Staff to seek Commission approval if it determined that suspension of NRC rules or the environmental assessments considering severe accident mitigation design alternatives was necessary). The NRC later denied the petition for rulemaking. *See Generic Determinations Regarding the Environmental Impacts of Spent Fuel Storage and Disposal When Considering Nuclear Power Reactor License Applications; Petition for Rulemaking; Denial*, 81 Fed. Reg. 31,532 (May 19, 2016).

in abeyance any related contentions, including the proposed contention filed by both Joint Intervenor and CASE on this docket.³⁹ We lifted the suspension on final licensing decisions in August 2014, after we approved a generic environmental impact statement and final Continued Storage Rule that addressed the issues in the remand.⁴⁰ We dismissed the proposed contention as a challenge to the new rule and also dismissed, or directed the Boards to dismiss, the other pending contentions.⁴¹ CASE, the Southern Alliance for Clean Energy, and the National Parks Conservation Association thereafter also joined in petitions, filed in multiple dockets, relating to both the safety aspects and environmental impacts of continued storage of spent fuel, which we denied.⁴²

Petitioners continued to raise hydrology issues throughout the contested proceeding. The City of Miami filed a petition to intervene after the initial deadline and submitted three contentions, which the Board denied, but Miami was granted the right to participate as an interested local government under 10 C.F.R. § 2.315(c).⁴³ In late 2016, CASE proposed four new contentions based on the Final EIS; the Board denied its petition.⁴⁴

³⁹ *Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-12-16, 76 NRC 63, 67-69 (2012).

⁴⁰ *Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-14-8, 80 NRC 71, 74-75 (2014). *See generally* Continued Storage of Spent Nuclear Fuel; Final Rule, 79 Fed. Reg. 56,238 (Sept. 19, 2014); Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel, 79 Fed. Reg. 56,263 (Sept. 19, 2014); “Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel” (Final Report), NUREG-2157, vols. 1 & 2 (Sept. 2014) (ML14196A105 and ML14196A107).

⁴¹ Joint Intervenor and CASE each sought to have admitted a waste confidence contention. Following our direction in CLI-14-8, the Board rejected their motions (and again dismissed CASE from the contested proceeding). Licensing Board Order (Denying Waste Confidence Contention Motions and Dismissing CASE) (Sept. 10, 2014), at 3 (unpublished). Thereafter, CASE submitted another petition to intervene and contentions challenging the adequacy of the Draft EIS, which the Board denied. Licensing Board Order (Denying CASE’s Petition to Intervene) (June 25, 2015), at 1 (unpublished).

⁴² *DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-4, 81 NRC 221, 240, 242 (2015) (finding that the Commission is not required, under the Atomic Energy Act, to make predictive findings regarding the technical feasibility of spent fuel disposal as part of its reactor licensing decisions).

⁴³ One of Miami’s contentions was virtually identical to Joint Intervenor’s Contention 2.1. *See* LBP-15-19, 81 NRC 815, 822 (2015), *appeal denied as premature by* CLI-16-1, 83 NRC 1, 9 (2016) (holding that the City of Miami could appeal its party status at the end of the proceeding pursuant to 10 C.F.R. § 2.341(b)). The City of Miami did not renew its appeal.

⁴⁴ The proposed contentions related to the use of reclaimed water for cooling; the possible use of injection wells that draw water from the Upper Floridan Aquifer; injecting effluent into the Boulder Zone; and the Staff’s compliance with NEPA. Citizens Allied for Safe Energy Petition to Intervene

(Continued)

Finally, in April 2017, three Florida municipalities — the City of Miami, Village of Pinecrest, and City of South Miami — jointly sought a hearing.⁴⁵ These petitioners proposed one contention challenging the financial qualifications of FPL, based primarily on Westinghouse Electric Company’s declaration of bankruptcy the previous month.⁴⁶ The Board found that the petitioners’ contention failed to satisfy the contention admissibility standards.⁴⁷ In short, the Board found that neither of the petitioners’ two arguments supporting the contention — that FPL would be unable to recover construction costs from Florida and that Westinghouse’s bankruptcy would make it more difficult for FPL to secure external sources of funding for construction costs — raised a genuine dispute on a material issue of law or fact.⁴⁸ With this decision, the Board terminated the contested proceeding.⁴⁹

D. The Uncontested Proceeding

All safety and environmental matters relevant to the combined license application, except those resolved in the contested proceeding, are subject to our review in the uncontested proceeding.⁵⁰ The uncontested portion of the proceeding begins once the Staff has completed both its environmental and safety reviews. Here, the Final EIS was published in October 2016, and the Final Safety

and Request for a Hearing in Opposition to the Final Report EIS Granting [Combined Licenses] for Turkey Point Units 6 & 7 (Nov. 28, 2016), at 4; *see* LBP-17-2, 85 NRC 14, 17 (2017). CASE did not appeal.

⁴⁵ Petition for Leave to Intervene in a Hearing on Florida Power & Light Company’s Combined Construction and Operating License Application for Turkey Point Units 6 & 7 and File a New Contention (Apr. 18, 2017). The City of Miami and Village of Pinecrest, as noted above, already were participating in the contested proceeding as interested local governments. The City of South Miami had not previously intervened in the proceeding.

Both Miami and South Miami have submitted comments for the mandatory hearing raising issues similar to those in their intervention petition; we have taken these comments under advisement. *See* The City of Miami’s (“City”) Statement of Issues or Questions for Consideration by the United States Nuclear Regulatory Commission at the Evidentiary Hearing in the Uncontested Portion of FPL’s COLA for Turkey Point Units 6 and 7 (Jan. 4, 2017), at 3, Ex. A, Affidavit of Mark W. Crisp, P.E., at 5-7 (ML17004A280); Letter from Philip K. Stoddard, City of South Miami, to Annette L. Vietti-Cook, NRC (Jan. 4, 2017), at 3-5 (ML17004A181).

⁴⁶ LBP-17-6, 86 NRC 37, 41 (2017).

⁴⁷ *Id.*

⁴⁸ *Id.* at 49-50.

⁴⁹ *Id.* at 54. The City of South Miami appealed the decision; we affirmed. CLI-17-12, 86 NRC 215, 216 (2017).

⁵⁰ *See, e.g., Vogtle*, CLI-12-2, 75 NRC at 68.

Evaluation Report was completed in November 2016.⁵¹ We then received the Staff's statement in support of the uncontested hearing, which serves as the Staff's initial testimony and provides an overview of its safety and environmental review of the application.⁵² Consistent with the design-centered review approach, the Staff's statement focused on "[n]on-routine matters . . . that relate to any unique features of the facility or novel issues that arose as part of the review process."⁵³

In its statement, the Staff indicated that its required consultations pursuant to section 7 of the Endangered Species Act with the U.S. Fish and Wildlife Service (FWS) and with the National Marine Fisheries Service (NMFS) had not yet concluded.⁵⁴ We therefore rescheduled the hearing to take place after the Staff had completed those consultations.⁵⁵ We further extended the mandatory hearing schedule to account for the interruption in FPL's hearing activities caused by Hurricane Irma.⁵⁶ We issued a revised Notice of Hearing on October 10, 2017, which set a schedule for pre-hearing filings.⁵⁷ In the notices of hearing, we invited interested states, local government bodies, and federally recognized Indian tribes to provide a statement of issues for us to consider as part of the uncontested proceeding.⁵⁸ We also issued pre-hearing questions to

⁵¹ Tr. at 50 (Ms. Ordaz). After publication of the Final EIS, the Staff identified fifty-nine comment letters received during the comment period that were inadvertently excluded from consideration in the Final EIS. Tr. at 62 (Ms. Dixon-Herrity); Ex. NRC-007A, "Environmental Impact Statement for Combined Licenses for Turkey Point Nuclear Plant, Units 6 and 7," NUREG-2176, supp. 1 (Dec. 2016), at iii-iv (ML17348A664) (Supplemental EIS). The Staff considered each of these comments and determined that each was either (1) identical or similar to other comments to which the Staff responded in Appendix E of the Final EIS, or (2) did not raise a significant environmental matter. Ex. NRC-001, Staff Information Paper, at 33 n.5. While none of these comments changed the review team's analyses or conclusions in the Final EIS, the Staff nonetheless issued a supplement to the Final EIS. Tr. at 62-63 (Ms. Dixon-Herrity); Ex. NRC-007A, Supplemental EIS, at iii.

⁵² See Ex. NRC-001, Staff Information Paper, at 2.

⁵³ *Id.*

⁵⁴ *Id.* at 5-6, 26.

⁵⁵ See CLI-17-1, 85 NRC 1, 2 (2017); see also Florida Power and Light Company; Turkey Point, Units 6 and 7; Combined License Application; Hearing, 81 Fed. Reg. 89,995 (Dec. 13, 2016); Florida Power and Light Company; Turkey Point, Units 6 and 7, Combined License Application; Revised Notice of Hearing, 82 Fed. Reg. 34,995 (July 27, 2017).

⁵⁶ Order of the Secretary (Sept. 12, 2017), at 1 (unpublished).

⁵⁷ Florida Power and Light Company; Turkey Point, Units 6 and 7; Combined License Application; Revised Notice of Hearing, 82 Fed. Reg. 47,044 (Oct. 10, 2017); see also Order of the Secretary (Oct. 11, 2017) (unpublished).

⁵⁸ In response to the original notice of hearing's solicitation for comments from affected state, local, and tribal governments, a number of entities, including sister federal agencies, local government entities, and a tribal government, submitted comments related to FPL's combined license application.

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both the Staff and FPL and received their written responses prior to the hearing.⁵⁹

The hearing presentations were made by witness panels.⁶⁰ The first panel of witnesses for FPL and the Staff gave an overview of the license application and the Staff's review, respectively. The second panel focused on safety issues, and the third panel focused on environmental issues. Overall, the Staff made available sixty-nine witnesses at the hearing, including scheduled panelists.⁶¹ Six witnesses offered testimony on behalf of FPL at the hearing and in pre-filed testimony.⁶²

Among other things, FPL's overview panelists discussed the general qualifications and nuclear experience of FPL,⁶³ the selection of the AP1000 certified design, and the site selection process; they also provided an overview of the site.⁶⁴ The Staff panelists provided background on the AP1000 design certification and the Staff's review of FPL's application, as well as a summary of the Staff's safety and environmental findings.⁶⁵

We received and took under advisement letters from Miami-Dade County (ML17003A357, resubmitted on Aug. 23, 2017), the Florida Keys Aqueduct Authority (ML17003A428, resubmitted on Aug. 7, 2017), the Seminole Tribe of Florida (ML17006A140), the City of Miami (ML17004A280), the City of South Miami (ML17004A181 and ML17242A185), and Monroe County (ML17243A336 and ML17006A141), as well as State Senator José Javier Rodríguez (ML17235B122). Monroe County's second submission attached the comments of Miami Dade-County and the Florida Keys Aqueduct Authority. Additionally, the EPA provided comments on the Final EIS (ML17010A034), and NPS provided comments on both the Final EIS and the Final Safety Evaluation Report (ML17006A137).

⁵⁹ Order of the Secretary (Transmitting Pre-Hearing Questions) (Sept. 1, 2017) (unpublished); Ex. NRC-005-R, NRC Staff Responses to Commission Pre-Hearing Questions (Jan. 23, 2018) (ML-18031A309) (Staff Pre-Hearing Responses); Ex. FPL-003, Florida Power & Light Company's Responses to Pre-Hearing Questions (Nov. 7, 2017) (ML17348A648) (FPL Pre-Hearing Responses).

⁶⁰ A scheduling note set forth the topics and order of presentations for the hearing. Scheduling Note, "Hearing on Combined Licenses for Turkey Point, Units 6 and 7: Section 189a. of the Atomic Energy Act Proceeding (Public Meeting)" (revised Dec. 4, 2017) (ML17338A947).

⁶¹ Tr. at 11-12 (Ms. Wright).

⁶² See Florida Power & Light Company's Witness List (Nov. 7, 2017); Tr. at 163 (Mr. Turner); Ex. FPL-001, Applicant's Pre-Filed Testimony in Support of the Mandatory Hearing for the Turkey Point, Units 6 and 7 Combined License (Nov. 7, 2017) (FPL Pre-Filed Testimony).

⁶³ FPL is a wholly owned subsidiary of NextEra Energy, Inc. Ex. FPL-001, FPL Pre-filed Testimony, at 3; Tr. at 16-17 (Mr. Nazar). FPL operates four nuclear units, two units at the St. Lucie site and two units at the Turkey Point site. Tr. at 18 (Mr. Nazar). NextEra Energy Resources, an FPL-affiliated entity, also owns and operates the Seabrook, Point Beach, and Duane Arnold nuclear plants. *Id.* (Mr. Nazar).

⁶⁴ See Ex. FPL-004, Florida Power & Light Company's Presentation Slides: Overview (Dec. 5, 2017) (ML17348A649); Tr. at 15-48.

⁶⁵ See Ex. NRC-009, Staff Presentation Slides — Overview Panel (Dec. 5, 2017) (ML17348A684) (Staff Overview Presentation); Tr. at 48-82.

The safety panel focused on two novel issues related to Turkey Point Units 6 and 7: (1) probable maximum storm surge, including sea level rise; and (2) deep well injection for liquid radioactive waste disposal.⁶⁶ The environmental panel discussed novel issues associated with cooling water sources, alternative sites, critical habitat, and consultations with the FWS and NMFS pursuant to the Endangered Species Act.⁶⁷ These issues are discussed further in section II.

After the hearing, we posed additional questions to the Staff and FPL.⁶⁸ The parties' written responses were admitted as exhibits, and after adopting corrections to the hearing transcript, we closed the evidentiary record.⁶⁹

II. DISCUSSION

Although our review encompassed the entire application, our decision discusses just a few of the safety and environmental topics addressed during the uncontested portion of the proceeding. We first consider FPL's requested exemptions from our regulatory requirements and departures from the AP1000 certified design. Our discussion then turns to site-specific and novel issues.

A. Exemptions and Departures

FPL requested eight exemptions and identified seventeen departures from the AP1000 certified design.⁷⁰ Where a combined license applicant references

⁶⁶ See Tr. at 83-133; Ex. FPL-005, Florida Power & Light Company's Presentation Slides: Safety Panel (Dec. 5, 2017) (ML17348A650); Ex. NRC-010, Staff Presentation Slides — Safety Panel (Dec. 5, 2017) (ML17348A685).

⁶⁷ See Tr. at 134-79; Ex. FPL-006, Florida Power & Light Company's Presentation Slides: Environmental Panel (Dec. 5, 2017) (ML17348A652); Ex. NRC-011, Staff Presentation Slides — Environmental Panel (Dec. 5, 2017) (ML17348A686).

⁶⁸ Order of the Secretary (Transmitting Post-Hearing Questions) (Dec. 19, 2017) (unpublished).

⁶⁹ Order of the Secretary (Adopting Proposed Transcript Corrections, Admitting Post-Hearing Exhibits, and Closing the Record of the Proceeding) (Jan. 18, 2018) (unpublished). The Staff subsequently filed a motion to reopen the record for the limited purpose of admitting into evidence a revised exhibit, Ex. NRC-005-R, Staff Pre-Hearing Responses. NRC Staff Motion to Reopen the Record to File Corrected Exhibit NRC-005-R (Jan. 23, 2018). We grant that motion, admit Ex. NRC-005-R into the record, and strike Ex. NRC-005 from the record. The Staff's revision took the form of a revised attachment to the pleading transmitting its responses to pre-hearing questions. Citations here to NRC-005-R reference the January 23, 2018, revision.

⁷⁰ Ex. FPL-001, FPL Testimony, at 5-12; Ex. NRC-008F, Florida Power and Light Company, Application for Combined License for Turkey Point Units 6 and 7, Part 7, Departures and Exemption Requests, rev. 8 (Aug. 2016), at 7-1 to 7-2 (ML17348A675) (Departures and Exemptions). The Staff identified an additional needed exemption and evaluated and found acceptable all nine exemptions

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a certified design, changes to the design may be made in the combined license if proposed as a departure from the certified design. Certain departures may be made without prior Commission approval.⁷¹ But departures that involve a change to the design as described in the rule certifying the design require an exemption from our regulations.⁷² The Staff may approve an exemption where it finds that the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption.⁷³ In addition, the Staff must determine that the special circumstances outweigh any decrease in safety resulting from the reduction in standardization that may result from the exemption.⁷⁴

All of the exemptions proposed by FPL are similar to those previously granted to other combined license holders.⁷⁵ FPL requested five departures requiring exemptions⁷⁶ that correspond to departures in the Levy and Lee combined license applications, which both also referenced the AP1000 certified design.⁷⁷ These departures concern containment cooling design changes with respect to the passive core cooling system condensate return, the main control room habitability dose analysis, heat load in the main control room during a design-basis event, control of containment hydrogen concentrations during a beyond-design-basis event, and the plant monitoring system's compliance with IEEE Standard 603-1991 related to source range neutron flux logic.⁷⁸ Consistent with the design-

from NRC regulations. Ex. NRC-001, Staff Information Paper, at 14, 15 n.4, 16-17; *see also infra* notes 80-81 and accompanying text.

⁷¹ 10 C.F.R. pt. 52, app. D, VIII.B.5.

⁷² *Id.* pt. 52, app. D, VIII.A.4. The requirements that combined license applicants must meet to obtain an exemption from NRC regulations are found at 10 C.F.R. § 52.93.

⁷³ *See id.* §§ 52.63(b)(1), 52.7, 50.12(a).

⁷⁴ *Id.* § 52.63(b)(1).

⁷⁵ Tr. at 33 (Mr. Franzone); *see also* Ex. NRC-001, Staff Information Paper, at 14-18.

⁷⁶ Each departure contains changes to AP1000 Tier 1 information or technical specifications and, as such, requires an exemption. Ex. NRC-001, Staff Information Paper, at 14.

⁷⁷ *Id.* at 16 (citing “Staff Statement in Support of the Uncontested Hearing for Issuance of Combined Licenses for the Levy Nuclear Plant Units 1 and 2 (Docket Nos. 52-029 and 52-030),” Commission Paper SECY-16-0076 (June 10, 2016) (ML12188A087) and “Staff Statement in Support of the Uncontested Hearing for Issuance of Combined Licenses for the William States Lee III Nuclear Station Units 1 and 2 (Docket Nos. 52-018 and 52-019),” Commission Paper SECY-16-0094 (Aug. 8, 2016) (ML16123A064)). The Staff designated the Levy combined license application as the “reference” application for the five common departures and exemptions. *Duke Energy Carolinas, LLC* (William States Lee III Nuclear Station, Units 1 and 2), CLI-16-19, 84 NRC 180, 199 (2016).

The ACRS reviewed and recommended approval of the requested departures and exemptions. *Id.* (citing Letter from Dennis C. Bley, ACRS, to Stephen G. Burns, NRC (Apr. 18, 2016), at 1 (ML16102A149)).

⁷⁸ Ex. NRC-001, Staff Information Paper, at 16.

centered review approach, the Staff found each requested departure and its accompanying exemption acceptable based on the reasoning also used for the Lee and Levy applications.⁷⁹

FPL requested an exemption from certain combined license application organization and numbering requirements in 10 C.F.R. Part 52, Appendix D, Section IV.A.2.a in order to be consistent with NRC guidance in Regulatory Guide 1.206 and NUREG-0800.⁸⁰ The Staff found the minor administrative change to be acceptable and determined that an associated exemption from 10 C.F.R. § 52.93(a)(1) was necessary (and likewise acceptable).⁸¹ FPL also seeks an exemption from certain requirements pertaining to material control and accounting for special nuclear material, such that the same requirements apply to both Part 52 and Part 50 licenses.⁸²

And finally, FPL requested an exemption from a design certification document site parameter value for the maximum safety wet bulb (noncoincident) air temperature because the Turkey Point site value exceeded the AP1000 design certification document value by 1.3 degrees Fahrenheit.⁸³ Although the increase in temperature is small, the change affected a number of systems related to passive containment cooling, control room habitability, normal residual heat removal, component cooling water, spent fuel pool cooling, and central chilled water.⁸⁴ The Staff concluded that the higher temperature would not ad-

⁷⁹ *Id.* We discussed our approval of these requested departures and their accompanying exemptions in our decision authorizing issuance of the combined licenses for the Levy Nuclear Plant. *Duke Energy Florida, LLC* (Levy County Nuclear Power Plant, Units 1 and 2), CLI-16-16, 84 NRC 66, 79-82 (2016).

⁸⁰ Ex. FPL-001, FPL Pre-Filed Testimony, at 5; Ex. NRC-001, Staff Information Paper, at 16.

⁸¹ Ex. NRC-001, Staff Information Paper, at 16-17.

⁸² This exemption has been granted to other combined license holders. *Id.* at 17; Ex. FPL-001, FPL Pre-Filed Testimony, at 6-7; *see also, e.g., Lee*, CLI-16-19, 84 NRC at 198 n.111.

⁸³ Ex. NRC-001, Staff Information Paper, at 17-18; Ex. FPL-001, FPL Pre-Filed Testimony, at 6; Tr. at 34 (Mr. Franzone). “The measured wet bulb temperature . . . provides an indication of the amount of water vapor in the atmosphere. Wet bulb temperature measures the lowest temperature that can be reached by evaporating water into the air. Essentially, a higher wet bulb temperature means that the air is not able to evaporatively cool a system as efficiently as when the wet bulb temperature is lower.” Ex. NRC-001, Staff Information Paper, at 17. The maximum safety wet-bulb (noncoincident) temperature is a site parameter value that represents a maximum wet-bulb temperature that exists within a set of hourly data for a duration of at least two hours. Ex. NRC-006, “Final Safety Evaluation Report for Combined Licenses for Turkey Point Units 6 and 7” (Nov. 2016), at 2-48 (ML17348A661) (Safety Evaluation Report).

⁸⁴ Ex. NRC-001, Staff Information Paper, at 18.

versely affect safety-related or defense-in-depth structures, systems, and components.⁸⁵

Of the seventeen departures requested by FPL and proposed to be approved by the Staff (if an approval is needed), two are standard for combined license applicants adopting the AP1000 design and eleven are departures common to multiple combined license applicants.⁸⁶ The remaining four departures are unique to the Turkey Point application.⁸⁷ The first unique departure increases the operating basis wind speed of the site from 145 miles per hour to 150 miles per hour.⁸⁸ The Staff found that FPL's stated site characteristics are acceptable for the Turkey Point site.⁸⁹ The wind load does not control the design for the nuclear island structures; an increase of wind speed from 145 miles per hour to 150 miles per hour will not require safety-related structures to be redesigned.⁹⁰ The second unique departure increases the maximum normal wet-bulb (noncoincident) air temperature by 1.4 degrees Fahrenheit.⁹¹ The Staff found that the increased value is acceptable for the Turkey Point site.⁹² The third departure

⁸⁵ *Id.* This exemption was also granted for the Summer combined license application, although the value for Summer was one-tenth of a degree less than the Turkey Point value. Tr. at 34 (Mr. Franzone). FPL performed a sensitivity analysis and determined that there was no increase in containment peak pressure for Turkey Point when using the higher Turkey Point value. *Id.* (Mr. Franzone).

This exemption includes an associated departure from the AP1000 design. See Ex. NRC-001, Staff Information Paper, at 20; Ex. NRC-006, Safety Evaluation Report, at 2-9 to 2-11. This exemption should be included in the licenses. See Ex. NRC-002, Draft Combined License for Turkey Point Unit 6 (Dec. 5, 2017), § 2.F (ML17348A657) (list of exemptions associated with departures); Ex. NRC-003, Draft Combined License for Turkey Point Unit 7 (Dec. 5, 2017), § 2.F (ML17348A658) (same).

⁸⁶ Ex. NRC-001, Staff Information Paper, at 18.

⁸⁷ *Id.* at 14; Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 3.

⁸⁸ Ex. NRC-001, Staff Information Paper, at 19.

⁸⁹ *Id.*; see also Ex. NRC-006, Safety Evaluation Report, at 2-8 to 2-9.

⁹⁰ Ex. NRC-008F, Departures and Exemptions, at 7-31 to 7-32. The safety-related structures are contained on the nuclear island, which consists of the containment/shield building and the auxiliary building. Ex. NRC-008A-A, Florida Power and Light Company, Application for Combined Licenses for Turkey Point Units 6 and 7, Part 2, Final Safety Analysis Report, rev. 8 (Aug. 2016), at 2.2-12 (ML17348A680) (Final Safety Analysis Report).

⁹¹ Ex. NRC-001, Staff Information Paper, at 19. The maximum normal wet-bulb (noncoincident) air temperature is the one-percent seasonal exceedance temperature. Ex. NRC-006, Safety Evaluation Report, at 2-49. This departure is different from the exemption (and departure) discussed above, associated with the revision of the maximum *safety* wet-bulb (noncoincident) air temperature.

⁹² Ex. NRC-001, Staff Information Paper, at 19. In its Safety Evaluation Report, the Staff also analyzed this departure as an exemption request. Ex. NRC-006, Safety Evaluation Report, at 2-6 to 2-7. Consistent with the Staff's testimony and FPL's application, however, we find that an exemption is not required for this departure; it does not involve a change to or departure from Tier

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modifies the minimum distance from the source boundary to the exclusion area boundary to 0.27 miles rather than the AP1000 design certification document site parameter of 0.5 miles. The Staff determined that this departure results in more conservative (i.e., higher) atmospheric dispersion (χ/Q) values and is therefore acceptable.⁹³

The fourth unique departure relates to the initiating event frequency for certain categories of high winds at the Turkey Point site, which is higher than that in the AP1000 design control document.⁹⁴ Following review of FPL's site-specific high winds and tornado analysis (in which the most conservative scenario only slightly exceeded the AP1000 design value), the Staff determined that the departure does not alter its conclusion that high winds do not contribute to core damage.⁹⁵

B. Site-Specific Issues

1. Safety-Related Issues

a. Storm Surge Analysis

The site grade of the proposed nuclear island for Units 6 and 7 is currently near sea level. During construction, the site grade will be raised to an elevation of 26 feet NAVD 88, to accommodate storm surge and wave run-up heights.⁹⁶ The design basis flood elevation at the Turkey Point site is governed by the probable maximum storm surge (PMSS) due to a probable maximum hurricane (PMH) approaching the site from the Atlantic Ocean.⁹⁷ FPL followed applicable NRC regulations and guidance in determining the design basis flood elevation

1 information, Tier 2* information, or the Technical Specifications of the AP1000 design control document. See Ex. NRC-008F, Departures and Exemptions, at 7-1, 7-8 to 7-11; Ex. NRC-001, Staff Information Paper, at 18-19.

⁹³ Ex. NRC-001, Staff Information Paper, at 20; Ex. NRC-006, Safety Evaluation Report, at 2-7 to 2-8.

⁹⁴ Ex. NRC-001, Staff Information Paper, at 20.

⁹⁵ *Id.*; Ex. NRC-006, Safety Evaluation Report, at 19-11; Ex. NRC-008F, Departures and Exemptions, at 7-28 to 7-29.

⁹⁶ Tr. at 26 (Mr. Franzone). The finished grade elevation at the plant area, where safety-related facilities are located, is 25.5 feet NAVD 88, but the elevation of floor entrances and openings of all safety-related structures is 26 feet NAVD 88. Ex. NRC-008A-A, Final Safety Analysis Report, at 2.4.5-2 to 2.4.5-3. The NAVD 88 (North American Vertical Datum of 1988) is the plant reference elevation datum for Units 6 and 7. Ex. NRC-006, Safety Evaluation Report, at 2-84.

⁹⁷ Ex. FPL-011, Florida Power & Light Company's Responses to Post-Hearing Questions (Jan. 9, 2018), at 10 (ML18019A040) (FPL Post-Hearing Responses) (citing Ex. NRC-008A-A, Final Safety Analysis Report § 2.4.5).

for the Turkey Point site.⁹⁸ The methods that FPL used to determine the PMSS are consistent with approaches used to determine PMSS for other combined license holders and existing reactor sites.⁹⁹

FPL's determination of the design basis flood elevation resulting from the storm surge calculation considers a combination of components, each of which FPL modeled using conservative estimates.¹⁰⁰ The resulting total storm surge is more than 9 feet higher than the storm surge of record in Florida from Hurricane Andrew.¹⁰¹ In total, the design basis flood elevation includes 4.1 feet of quantified conservatisms.¹⁰² FPL added 2.9 feet, or twenty percent, to the calculated PMH storm surge, and FPL used a value for the "extreme high tide plus sea level anomaly" that is 1.2 feet higher than the highest observed level in the local area.¹⁰³ FPL included other conservatisms in the analysis that have non-quantifiable effects — the intensity and size of the PMH,¹⁰⁴ no weakening of the PMH prior to landfall,¹⁰⁵ and the use of high wind speeds to generate the wind wave run-up.¹⁰⁶ And finally, the design plant grade elevation of 26.0 feet NAVD 88 provides a margin of 1.2 feet above the design basis flood elevation of 24.8 feet NAVD 88 resulting from the storm surge calculation.¹⁰⁷ With respect to sea

⁹⁸ Ex. FPL-011, FPL Post-Hearing Responses, at 10-11.

⁹⁹ Ex. NRC-001, Staff Information Paper, at 21.

¹⁰⁰ Ex. FPL-011, FPL Post-Hearing Responses, at 10-11; Ex. NRC-012, NRC Staff Responses to Commission Post-Hearing Questions (Jan. 9, 2018), Attach., at 6-7 (ML18019A041) (Staff Post-Hearing Responses).

¹⁰¹ Ex. NRC-012, Staff Post-Hearing Responses, Attach., at 6. Hurricane Andrew, a Category 5 storm, in 1992 produced the highest storm surge on record in Florida, including consideration of the preliminary data from the 2017 hurricanes. Tr. at 96 (Mr. Giacinto). The maximum storm surge from Hurricane Andrew was 15.4 feet, north of the Turkey Point site. *Id.*

¹⁰² Ex. NRC-012, Staff Post-Hearing Responses, Attach., at 7.

¹⁰³ *Id.*

¹⁰⁴ FPL used a large storm diameter — a radius of maximum winds of twenty nautical miles — for a storm as intense as the PMH. Ex. NRC-012, Staff Post-Hearing Responses, Attach., at 7. The large diameter increases the surge estimate. *Id.* The diameter and storm intensity are not independent, as the physics of hurricanes limits high-intensity storms to smaller diameters. *Id.*; see also Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 14-15. Hurricane Andrew, for example, had a radius of maximum winds of nine nautical miles at landfall. Ex. NRC-012, Staff Post-Hearing Responses, Attach., at 7.

¹⁰⁵ Typically, intense storms weaken before landfall. Ex. NRC-012, Staff Post-Hearing Responses, Attach., at 7.

¹⁰⁶ *Id.* "A ten-minute sustained straight-line wind of 159 miles per hour was used to generate wind waves. For comparison, this equates to a one-minute average wind speed of 188 miles per hour, which is significantly above the Category 5 hurricane one-minute average threshold wind speed of 157 miles per hour." *Id.*

¹⁰⁷ *Id.*; Ex. FPL-011, FPL Post-Hearing Responses, at 13.

level rise, FPL used 1.0 feet over the design life of the plant, which is 0.22 feet higher than the rise estimated from local tide gauges.¹⁰⁸

Miami Beach is the nearest tide gauge station to the Turkey Point site that has a period of record long enough to span multiple multi-decadal tidal cycles.¹⁰⁹ The National Oceanic and Atmospheric Administration's (NOAA) data analysis shows that sea level at the Miami Beach station is rising at a rate of 0.78 feet per century.¹¹⁰ Using the observed data and NRC guidance, FPL estimated a sea level rise of 1.0 feet over the life of Turkey Point Units 6 and 7.¹¹¹ Although recent scientific reports discuss the potential for more than 1 foot of sea level rise by 2100, the multiple conservatisms in other aspects of the storm surge calculation provide a significant safety margin in the event that sea level rise at the site exceeds 1 foot.¹¹² Moreover, "[t]he Staff will proactively, routinely, and systematically seek, evaluate, and respond to new information on natural hazards," including flooding due to sea level rise pursuant to the framework that we approved last year for ongoing assessment of natural hazard information.¹¹³

b. Use of Deep Well Injection for Liquid Radioactive Waste Disposal

FPL has proposed to use a nontraditional disposal method, deep well injec-

¹⁰⁸ Ex. NRC-012, Staff Post-Hearing Responses, Attach., at 7.

¹⁰⁹ Tr. at 98 (Ms. Smith).

¹¹⁰ *Id.* (Ms. Smith). The Miami Beach station was removed from service in 1981, but trends at Miami Beach are well correlated with trends at the Key West station, where NOAA tide records are available from 1913 to 2016. *Id.* at 99 (Ms. Smith).

¹¹¹ *Id.* (Ms. Smith). The Staff followed applicable guidance and used data from nearby tide gauges to estimate sea level rise. Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach. at 17; see "Probable Maximum Surge and Seiche Flooding," NUREG-0800, Standard Review Plan § 2.4.5, rev. 3 (Mar. 2007) (ML070730425); "Guidance for Performing a Tsunami, Surge, or Seiche Hazard Assessment" (Interim Staff Guidance), JLD-ISG-2012-06, rev. 0 (Jan. 2013) (ML12314A412).

¹¹² See, e.g., City of South Miami Statement in the Evidentiary Session of the Uncontested Portion of the Proceeding on the Application of Florida Power and Light Co. (FPL) Application for Issuance of Combined Licenses for Turkey Point Units 6 and 7 (Aug. 30, 2017) (ML17242A185). FPL also noted that, if sea level rise exceeds the 1-foot estimate accounted for in the licensing basis, then it will follow an established plant procedure — the formal corrective action program under 10 C.F.R. Part 50, Appendix B, Criterion XVI or operability determinations as described in NRC Regulatory Issue Summary 2005-20 — to either reevaluate the flood hazard or implement corrective action. Ex. FPL-003, FPL Pre-Hearing Responses, at 22.

¹¹³ Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 16-17 (citing "Proposed Resolution of Remaining Tier 2 and 3 Recommendations Resulting from the Fukushima Dai-Ichi Accident," Commission Paper SECY-16-0144 (Dec. 29, 2016) (ML16286A552)); see *id.*, Encl. 2, "Recommendation 2.2: Plan to Ensure Ongoing Assessment of Natural Hazard Information" (ML16286A569); Staff Requirements — SECY-16-0144 — Proposed Resolution of Remaining Tier 2 and 3 Recommendations Resulting from the Fukushima Dai-Ichi Accident" (May 3, 2017) (ML17123A453).

tion, for NRC-licensed radioactive material in liquid effluent.¹¹⁴ This proposed disposal approach would be unique for a nuclear power plant in the United States.¹¹⁵ Blowdown from the cooling towers and other plant discharge effluents would be collected in a sump and injected via underground injection wells into the Boulder Zone of the Lower Floridan Aquifer, which is approximately 2,800 feet below ground.¹¹⁶ The Floridan Aquifer is one of two aquifers underlying the Turkey Point site, and it is divided into the following three levels in descending order: the Upper Floridan Aquifer, the middle confining unit, and the Lower Floridan Aquifer.¹¹⁷

The Florida Department of Environmental Protection (FDEP) has the authority to issue permits for discharge of wastewater via injection wells into the Boulder Zone in Florida.¹¹⁸ The FDEP has permitted over 180 Class I injection wells for disposal of municipal and industrial wastewater into the Boulder Zone.¹¹⁹ FPL plans to install six pairs of injection wells for Units 6 and 7.¹²⁰ Each pair of wells will have a dual-zone monitoring well, which will detect if injected material is migrating upward from the Boulder Zone.¹²¹

FPL provided information to demonstrate compliance with 10 C.F.R. § 20.2002, which allows an applicant to seek approval of a disposal procedure

¹¹⁴ Tr. at 101 (Mr. Gran).

¹¹⁵ *Id.* (Mr. Gran); Ex. NRC-001, Staff Information Paper, at 23.

¹¹⁶ See Ex. NRC-008B, Florida Power and Light Company, Application for Combined Licenses for Turkey Point Units 6 and 7, Part 3, Environmental Report, rev. 6 (Nov. 2014), at 2.3-2, 2.3-15 to 2.3-16, 5.2-10 (ML17348A666) (Environmental Report); Ex. NRC-007, Final EIS, at 2-24.

¹¹⁷ See Ex. NRC-008B, Environmental Report, at 2.3-16, 2.3-18 to 2.3-19. “[T]he Floridan aquifer system is a vertically continuous sequence of interbedded carbonate rocks of Tertiary age that are hydraulically interconnected by varying degrees” See *id.* at 2.3-15. The other aquifer is the Biscayne Aquifer, which is the uppermost surficial aquifer system in the vicinity of the Turkey Point site. Ex. NRC-007, Final EIS, at 2-47. “Low-permeability confining units separate the Biscayne aquifer and the underlying Floridan aquifer system and limit exchange of groundwater between these aquifer systems.” *Id.*

¹¹⁸ See Ex. NRC-008B, Environmental Report, at 2.3-19.

¹¹⁹ Ex. NRC-007, Final EIS, at 2-61; Tr. at 89 (Mr. Jacobs). FDEP regulations specify approved construction techniques and testing and monitoring requirements for Class I wells. Ex. NRC-007, Final EIS, at 4-25. Class I wells are monitored to detect any migration of injected fluids before they could reach an underground source of drinking water. *Id.* at 4-21.

¹²⁰ Tr. at 90 (Mr. Jacobs). The injection wells will be installed between 2900 and 3500 feet below land surface. The base of the underground source of drinking water is approximately 1450 feet below land surface. Between the injection point and the underground source of drinking water is an area designated as the Middle Floridan Confining Zone, which is approximately 1000 feet thick and has a low hydraulic conductivity that prevents flow through the layer. *Id.* at 90-91 (Mr. Jacobs).

¹²¹ *Id.* at 90 (Mr. Jacobs). Florida requires all Class I injection wells to have a dual-zone monitoring system that consists of a zone open below the deepest underground source of drinking water and a zone located in the underground source of drinking water for geochemical and pressure monitoring. Ex. NRC-008B, Environmental Report, at 2.3-53.

not otherwise authorized by the regulations.¹²² FPL determined the radionuclides to be used in the analysis based on the largest contributors to dose and then provided conservative groundwater modeling scenarios of both radial and vertical transport of effluents within and out of the Boulder Zone.¹²³ This modeling resulted in a cumulative radionuclide inventory at the end of plant operations.¹²⁴ FPL then evaluated the scenarios that would produce the highest dose to potential receptors to demonstrate compliance with NRC standards.¹²⁵

The Staff typically approves requests under section 20.2002 that will result in a dose to a member of the public that is no more than “a few millirem/year.”¹²⁶ The Staff used the criteria in 10 C.F.R. Part 50, Appendix I for evaluating dose; these criteria are normally used in calculating dose to the maximally exposed individual for surface water disposals of liquid effluent.¹²⁷ Under FPL’s worst-case scenario analysis, a subsistence driller sinks a well deep into the Upper Floridan Aquifer to supply water for drinking and production of food, and that well is located directly above a hypothetical failure in the lowermost confining barrier above the Boulder Zone.¹²⁸ The subsistence driller’s dose would be less than a few millirem per year, in compliance with the Appendix I limits.¹²⁹ The Staff reviewed FPL’s approach and concluded that the disposal of liquid radioactive waste as described in the application meets the requirements of 10 C.F.R. § 20.2002: FPL has adequately described the waste, performed an analysis that described the environment in which the effluent is transported, described the nature and location of potentially affected individuals and entities, and has ensured that doses will be maintained as low as is reasonably achievable by meeting Appendix I and all other applicable NRC regulations.¹³⁰

¹²² Ex. NRC-001, Staff Information Paper, at 23. The applicant must include a description of the waste, the proposed manner and conditions of disposal, an analysis of the nature of the environment, the nature and location of other potentially affected facilities, and analyses and procedures to ensure that doses are maintained as low as is reasonably achievable and within the dose limits of Part 20. 10 C.F.R. § 20.2002. At most facilities, such effluent is released to surface water.

¹²³ Ex. NRC-001, Staff Information Paper, at 23.

¹²⁴ *Id.*

¹²⁵ *Id.*

¹²⁶ *Id.* at 23-24 (citing “Basis and Justification for Approval Process for 10 C.F.R. 20.2002 Authorizations and Options for Change,” Commission Paper SECY-07-0060 (Mar. 27, 2007), Encl. 1 (ML062050587); “Decommissioning Process for Materials Licensees” (Final Report), NUREG-1757, vol. 1, rev. 2 (Sept. 2006) § 15.12 (ML063000243)).

¹²⁷ Ex. NRC-001, Staff Information Paper, at 24.

¹²⁸ Tr. at 93-94 (Mr. Orthen).

¹²⁹ *Id.* at 94 (Mr. Orthen); Ex. NRC-006, Safety Evaluation Report, at 11-26.

¹³⁰ Ex. NRC-001, Staff Information Paper, at 24; Ex. NRC-006, Safety Evaluation Report, at 11-33 to 11-36. In addition to 10 C.F.R. § 20.2002, the Staff found the design of the liquid waste
(Continued)

c. *Site Selection — Population Density*

Our rules direct that “[r]eactor sites should be located away from very densely populated centers.”¹³¹ While sites in areas of low population density are generally preferred, a particular site not in an area of low density but “located away” from a high-density population may still be acceptable.¹³² “Locating reactors away from densely populated centers is part of the NRC’s defense-in-depth philosophy and facilitates emergency planning and preparedness, as well as reduces potential doses and property damage in the event of a severe accident.”¹³³

NRC guidance states that “[a] reactor should be located so that . . . the population density . . . averaged over any radial distance out to 20 miles . . . does not exceed 500 persons per square mile. A reactor should not be located at a site where the population density is well in excess of [this] value.”¹³⁴ During its review of the combined license application, the Staff determined that the population density criterion of 500 persons per square mile was exceeded for the Turkey Point site.¹³⁵ Contemplating such a circumstance, the guidance provides that “[i]f the population density of the proposed site exceeds, but is not well in excess of the above preferred value, . . . consideration of other factors, such as safety, environmental, or economic concerns, may result in the site with the higher population density being found acceptable.”¹³⁶ The Staff determined that “[t]he projected maximum density value determined within 20 miles of the Turkey Point site is about 200 people per square mile in excess of the 500 people per square mile which, for this site, is a reasonable proportion of the criterion.”¹³⁷ On this basis, the Staff determined that the population density for the Turkey Point site was not “well in excess” of the criterion set forth in the guidance.¹³⁸ In determining the acceptability of the site, the Staff, consistent with 10 C.F.R. § 100.21(h) and Regulatory Guide 4.7, evaluated the physical

management system satisfied the requirements of sections 20.1301(e), 20.1302, 20.1406, 50.34a, and General Design Criteria 60 and 61 (located in 10 C.F.R. Part 50, Appendix A). Ex. NRC-006, Safety Evaluation Report, at 11-37.

¹³¹ 10 C.F.R. § 100.21(h).

¹³² *Id.* (in such cases, “consideration will be given to safety, environmental, economic, or other factors, which may result in the site being found acceptable”); *see also* “General Site Suitability Criteria for Nuclear Power Stations,” Regulatory Guide 4.7, rev. 3 (Mar. 2014), at 7 (ML12188A053) (Regulatory Guide 4.7).

¹³³ Regulatory Guide 4.7 at 7, 18.

¹³⁴ *Id.* at 18.

¹³⁵ Ex. NRC-012, Staff Post-Hearing Responses, Attach., at 1.

¹³⁶ Regulatory Guide 4.7 at 18. The guidance does not quantify a population “not well in excess” of the preferred value.

¹³⁷ Ex. NRC-012, Staff Post-Hearing Responses, Attach., at 1.

¹³⁸ *Id.*

characteristics of the site, with particular focus on the security and emergency plans and measures that ensure the public health and safety.¹³⁹ After considering these factors, including population density, the Staff found the Turkey Point site to be acceptable because the application demonstrated that the public health and safety would be assured.¹⁴⁰

With respect to the site selection process, FPL noted that “Florida’s unique geography with its largest metropolitan area near the southern end of a peninsula present[s] challenges for transmission planning and large generating facilities that must be located with adequate foresight.”¹⁴¹ FPL studied its entire service territory, with particular focus on areas that would serve the Miami load center.¹⁴² FPL selected the Turkey Point site over alternative sites with lower nearby population densities because the Turkey Point site has several safety, economic, reliability, and environmental attribute advantages.¹⁴³ Specifically, the Turkey Point site has a unique cooling water supply source, land availability, and existing nuclear power plant and emergency planning infrastructure.¹⁴⁴ The site also addresses an FPL reliability objective; it would enable generation in Miami-Dade County, closer to the load than any other alternative site.¹⁴⁵

2. *Environmental Issues*

a. *Cooling Water Sources*

Mechanical draft cooling towers will be used during normal operation of Units 6 and 7 to dissipate heat.¹⁴⁶ FPL plans to use reclaimed wastewater from the Miami-Dade Water and Sewer Department South District Wastewater Treat-

¹³⁹ *Id.*, Attach., at 2. According to FPL, “population density did not pose a significant impediment to the development of emergency plans.” Ex. FPL-011, FPL Post-Hearing Responses, at 7. Furthermore, our regulations require emergency plans to be continually maintained and updated, including accounting for changes in population characteristics. 10 C.F.R. pt. 50, app. E, IV.5-7.

¹⁴⁰ Ex. NRC-012, Staff Post-Hearing Responses, Attach., at 2. The Staff noted that the highest population density at any radial distance out to 20 miles for the Turkey Point site is comparable to that of previously licensed sites. *Id.* For example, the Limerick site had a density of 789 persons per square mile at 5 miles; the Zion site had a density of 668 persons per square mile at 10 miles; and the Connecticut Yankee site had a density of 716 persons per square mile at 20 miles. *Id.* (citing “Metropolitan Siting — A Historical Perspective,” NUREG-0478 (Oct. 1978), tbl.I (ML12187A192)).

¹⁴¹ Tr. at 23 (Mr. Maher).

¹⁴² *Id.* (Mr. Maher).

¹⁴³ Ex. FPL-011, FPL Post-Hearing Responses, at 7.

¹⁴⁴ *Id.* at 7-10.

¹⁴⁵ *Id.* at 8.

¹⁴⁶ Ex. NRC-008B, Environmental Report, at 1.1-3.

ment Plant as the principal source of makeup cooling water.¹⁴⁷ The plant is located 9 miles north of the Turkey Point site. After treatment, pipelines will carry approximately 73 million gallons per day of water to the Turkey Point site.¹⁴⁸ The reclaimed water will then be further treated at FPL's onsite facility for use in the cooling system.¹⁴⁹ If reclaimed water is not available in the quantity or quality that FPL needs, radial collector wells will serve as a backup source of cooling water.¹⁵⁰ The proposed makeup water reservoir has approximately a three-day supply of reclaimed water available for cooling the units.¹⁵¹

The South District Wastewater Treatment Plant currently injects treated water at a rate of 97 million gallons per day into the Boulder Zone.¹⁵² During operation of Units 6 and 7, the estimated injection rate into the Boulder Zone at the Turkey Point site would be 18 million gallons per day of blowdown water from the cooling towers.¹⁵³ The environmental review team¹⁵⁴ determined that construction of the injection and monitoring wells related to proposed wastewater injection would have negligible effects on groundwater quality in the surficial Biscayne Aquifer and the deeper Floridan Aquifer system.¹⁵⁵ With respect to operation, the review team concluded that the South District Wastewater Treatment Plant will filter and disinfect the wastewater to a level that will protect the underground source of drinking water should the injected wastewater migrate out of the Boulder Zone.¹⁵⁶ The review team further concluded that significant upwelling of the injected wastewater is not likely at the Turkey Point site due to the confining ability of the middle confining unit, which separates the Upper and

¹⁴⁷ *Id.* Palo Verde Nuclear Generating Station is the only nuclear power plant in the United States currently using reclaimed water as its primary source of cooling water. Ex. NRC-001, Staff Information Paper, at 25; *see also* Tr. at 27 (Mr. Franzone).

¹⁴⁸ Ex. NRC-001, Staff Information Paper, at 24; *see* Ex. NRC-008B, Environmental Report, at 5.2-1.

¹⁴⁹ Ex. NRC-001, Staff Information Paper, at 24; Ex. NRC-008B, Environmental Report, at 5.2-1.

¹⁵⁰ Tr. at 27 (Mr. Franzone).

¹⁵¹ *Id.* at 29 (Mr. Franzone).

¹⁵² Ex. NRC-001, Staff Information Paper, at 24.

¹⁵³ *Id.*

¹⁵⁴ The environmental review team consisted of individuals with expertise in disciplines including ecology, geology, hydrology, meteorology, radiological health, socioeconomics, and cultural resources. Ex. NRC-007, Final EIS, app. A. The team consisted of individuals from the NRC, its contractors, and the Corps. *Id.* at xxxi. The National Park Service provided special expertise for the areas in and around Biscayne and Everglades National Parks. *Id.* at xxxi, A-2 to A-3.

¹⁵⁵ Ex. NRC-007, Final EIS, at 4-33. This conclusion is due, in part, to FDEP regulations governing deep well injection. *Id.*

¹⁵⁶ Ex. NRC-007, Final EIS, at 5-21. The wastewater will receive further treatment onsite at Turkey Point; additionally, the concentrations of contaminants in the wastewater would be reduced due to volatilization and dilution at the site before injection. *Id.*

Lower Floridan Aquifer.¹⁵⁷ In addition to the isolation of the Boulder Zone from the overlying underground source of drinking water and the treatment of the wastewater, the review team evaluated the extent and fate of injected effluent at the site, reviewed risk assessments of deep well disposal, and considered FDEP monitoring requirements.¹⁵⁸ While injection would introduce contaminants into the Boulder Zone, the salt content of the water in the Boulder Zone is too high for it to be considered a potential, current, or future source of irrigation or drinking water.¹⁵⁹ The review team concluded that the operational impacts to groundwater quality would be “small.”¹⁶⁰

The alternative source of cooling water, which also would be capable of supplying one hundred percent of the makeup water for non-safety-related circulating-water system cooling demand, would be saltwater supplied from horizontal radial collector wells installed in the Biscayne Aquifer between 25 and 40 feet beneath the bed of Biscayne Bay and adjacent to Biscayne National Park.¹⁶¹ This alternative source “would only be used when needed to supplement makeup-water demand when reclaimed water is not available in sufficient quantity or quality, and would be limited to a maximum of 60 days per year by the Florida State Conditions of Certification.”¹⁶² Withdrawal from the four radial collector wells would be at a maximum flowrate of 86,400 gallons per minute (about 124 million gallons per day).¹⁶³ This rate is higher than what it would be for reclaimed water, which would be cycled through the plant a greater number of times.¹⁶⁴ The Staff considered three independent modeling studies to determine the potential impacts to the hydrological environment as a result of the operation of the radial collector wells.¹⁶⁵ The studies projected insignificant alterations to both Biscayne Bay and the underlying Biscayne Aquifer as a result of the operation of the wells.¹⁶⁶

¹⁵⁷ *Id.* at 5-21 to 5-22, 5-28.

¹⁵⁸ *Id.* at 5-41 to 5-42.

¹⁵⁹ *Id.* at 5-42.

¹⁶⁰ *Id.* As discussed above, certain environmental impacts of deep well injection disposal were the subject of a contention in the contested proceeding. The Board found that the Staff demonstrated that the environmental impacts would be “small” because the wastewater is unlikely to migrate to the Upper Floridan Aquifer, and even if it did, the chemicals at issue would be at concentrations too low to pose any known health risks. LBP-17-5, 86 NRC at 5.

¹⁶¹ Ex. NRC-007, Final EIS, at 2-24; *see also* Ex. NRC-008B, Environmental Report, at 1.1-3.

¹⁶² Ex. NRC-007, Final EIS, at 2-24.

¹⁶³ Ex. NRC-001, Staff Information Paper, at 25.

¹⁶⁴ *Id.* Reclaimed water could be cycled through the circulating water system four times, whereas the saltwater from radial collector wells would be cycled 1.5 times through the plant. *Id.* at 24-25.

¹⁶⁵ *Id.* at 25.

¹⁶⁶ *Id.*

b. Alternative Sites

In its site selection process, FPL used the guidance in NRC's Environmental Standard Review Plan, Regulatory Guide 4.7, and the Electric Power Research Institute's siting guide.¹⁶⁷ FPL's screening process began with selecting a region of interest, which was the FPL service area, and screened sites in successive steps until a reasonable number of alternative sites were determined and evaluated; from these FPL selected the Turkey Point site.¹⁶⁸ FPL selected the Turkey Point site based on a provision in the Environmental Standard Review Plan that acknowledges a proposed site may be selected because an existing nuclear plant is already located there.¹⁶⁹ FPL then compared the Turkey Point site to the alternative sites that were identified through the site selection process and determined that there was no obviously superior alternative site.¹⁷⁰ The Staff also conducted an independent evaluation of the alternative sites and compared them to the Turkey Point site and likewise concluded that there was no obviously superior site.¹⁷¹

In its alternative site analysis, the Staff typically uses the same cooling water system design at each of the alternative sites as would be used at the proposed site.¹⁷² But this was not possible for the Turkey Point application because the alternative sites did not have potential sources of reclaimed wastewater.¹⁷³ Instead, FPL evaluated different approaches for cooling the plants at the alternative sites.¹⁷⁴ At the St. Lucie site, cooling water would come from the Atlantic Ocean.¹⁷⁵ For the three inland sites, FPL used a combination of excess surface

¹⁶⁷ Ex. NRC-007, Final EIS, at 9-34.

¹⁶⁸ *Id.*

¹⁶⁹ *Id.*; Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 38-39; *see also* "Environmental Standard Review Plan," NUREG-1555, rev. 1 (July 2007) § 9.3, at 9.3-11 to 9.3-12 (ML071800223) ("Recognize that there will be special cases in which the proposed site was not selected on the basis of a systematic site-selection process. Examples include plants proposed to be constructed on the site of an existing nuclear power plant previously found acceptable on the basis of a NEPA review and/or demonstrated to be environmentally satisfactory on the basis of operating experience . . ."). FPL also retained the St. Lucie site as a candidate site based on this provision. Ex. NRC-007, Final EIS, at 9-34.

¹⁷⁰ Ex. NRC-012, Staff Post-Hearing Responses, Attach., at 4. The Staff observed that "FPL then implemented an acceptable systematic and logical selection process to identify alternative sites and to compare [the Turkey Point site] to the alternative sites to determine if any alternative was environmentally preferable." Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 38.

¹⁷¹ Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 38.

¹⁷² Ex. NRC-001, Staff Information Paper, at 25.

¹⁷³ *Id.*

¹⁷⁴ *Id.*

¹⁷⁵ *Id.*

water (with a reservoir) and pumping groundwater from a deep, saline aquifer.¹⁷⁶ For these inland sites, FPL also considered the use of a desalination plant to reduce the salt content of the cooling water to protect nearby vegetation.¹⁷⁷ Recognizing the uncertainty about cooling water sources at the alternative inland sites, the review team analyzed them in the Final EIS without the reservoir and without the desalination plant and also qualitatively assessed how those impacts would be different if a reservoir was included in the system.¹⁷⁸ The review team determined that a reservoir would increase the impacts on land use and terrestrial ecology and also would result in a minor increase in impacts to aquatic ecology and surface-water use.¹⁷⁹ Under the review team's approach, the alternative sites were considered under the most environmentally favorable circumstances. Even so, the review team concluded that none of the alternative sites was environmentally preferable and, therefore, not obviously superior to the Turkey Point site.¹⁸⁰

c. Endangered and Threatened Species

Under the Endangered Species Act, any action authorized by the NRC must not jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify the critical habitat of such a species.¹⁸¹ The NRC must consult with the FWS or NMFS, as appropriate, on activities that may affect a listed species or a species proposed to be listed.¹⁸² Thirty-nine terrestrial species listed or proposed to be listed as federally threatened, endangered, or candidates for listing as threatened or endangered are known to occur in Miami-Dade County or the vicinity of the Turkey Point site.¹⁸³ And ten aquatic species listed as threatened or endangered could occur at the Turkey Point site.¹⁸⁴

¹⁷⁶ *Id.*

¹⁷⁷ *Id.* at 25-26.

¹⁷⁸ *Id.* at 26. The Staff determined that it might be possible to cool the plants at the inland sites without the use of a reservoir and without the desalination plant. *Id.*

¹⁷⁹ *Id.*

¹⁸⁰ *Id.*; see Ex. NRC-007, Final EIS, at 9-247 to 9-249.

¹⁸¹ Endangered Species Act, 16 U.S.C. § 1536(a)(2).

¹⁸² *Id.* § 1536(a)(3). Federal agencies must also consult with the FWS or NMFS on actions that are likely to jeopardize the continued existence of any species proposed to be listed under section 4 of the Act or result in the destruction or adverse modification of critical habitat proposed to be designated for such species. *Id.* § 1536(a)(4).

¹⁸³ Ex. NRC-007, Final EIS, at 2-82 & tbl.2-12. The listed terrestrial species include eighteen plants, twelve birds, two mammals, one reptile, and five invertebrates. *Id.*

¹⁸⁴ *Id.* at 2-143 & tbl.2-28. The listed aquatic species include five sea turtles, two other aquatic reptiles, one fish, one marine mammal, and one seagrass. *Id.*

(1) CONSULTATIONS WITH THE U.S. FISH & WILDLIFE SERVICE

The Staff initiated formal consultation with the FWS under Section 7 of the Endangered Species Act by letter in September 2016.¹⁸⁵ With its letter, the Staff included its Biological Assessment that outlined the Staff's evaluation of potential effects on threatened or endangered species known to potentially occur in the area of the proposed project.¹⁸⁶ The consultation concluded in June 2017 with the FWS's issuance of a Biological Opinion.¹⁸⁷

The Biological Opinion concluded that the proposed project would not likely put any species in jeopardy of extinction.¹⁸⁸ The FWS also concluded that the proposed project would either "have no effect" or "may affect but would not likely adversely affect" most threatened or endangered species potentially occurring in the area.¹⁸⁹ But the FWS found that the proposed project "may affect" and "could likely adversely affect" six listed (threatened or endangered) species: the Florida panther, American crocodile, eastern indigo snake, Everglades snail kite, red knot, and wood stork.¹⁹⁰ The FWS established incidental take limits for each of these six species.¹⁹¹ The Incidental Take Statement also sets forth reasonable and prudent measures, monitoring and reporting requirements, and requirements for the disposition of dead or injured individuals of listed species.¹⁹²

All non-discretionary terms and conditions of the Incidental Take Statement will be incorporated into either the combined licenses issued by the NRC or the Department of the Army permit issued by the Corps under Section 404 of the

¹⁸⁵ NRC Staff Analysis of Biological Opinion and Submission of Proposed License Conditions for Turkey Point Units 6 & 7 (July 7, 2017), Attach. A, NRC Staff Assessment of the U.S. Fish & Wildlife Service Biological Opinion (June 23, 2017), at 1 (Staff Analysis of Biological Opinion).

¹⁸⁶ *Id.* (citing Biological Assessment for the U.S. Fish and Wildlife Service (Feb. 2015) (ML-15028A372)).

¹⁸⁷ Letter from Roxanna Hinzman, Department of the Interior/FWS, to Alicia Williamson, NRC (June 23, 2017) (ML17177A673) (Biological Opinion). The Staff then notified us that it had completed consultations, provided its analysis of the Biological Opinion and Incidental Take Statement, and proposed related license conditions. Staff Analysis of Biological Opinion at 1 (attaching a revised Environmental Protection Plan).

¹⁸⁸ Staff Analysis of Biological Opinion, Attach. A, at 1 (citing Biological Opinion at 51).

¹⁸⁹ *Id.*, Attach. A, at 1 (citing Biological Opinion at 2, 13-17).

¹⁹⁰ *Id.*, Attach. A, at 1 (citing Biological Opinion at 2). The American crocodile is discussed in greater detail below.

¹⁹¹ *Id.*, Attach. A, at 1 (citing Biological Opinion at 48-53). "[T]aking that is incidental to, and not intended as part of the agency action, is not considered to be prohibited taking under the [Endangered Species] Act provided such taking is in compliance with the terms and conditions of this incidental take statement." Biological Opinion at 48. The limits are either expressed as the number of individuals injured or killed over specific time intervals or as acres of suitable habitat lost or degraded over specific time intervals. Staff Analysis of Biological Opinion, Attach. A, at 1 (citing Biological Opinion at 49-51).

¹⁹² *Id.*, Attach. A, at 1 (citing Biological Opinion at 51, 52).

Clean Water Act (Section 404 Permit).¹⁹³ The requirements to be included in the NRC licenses will be incorporated as conditions in the Environmental Protection Plan for each unit.¹⁹⁴ The conditions included by the NRC relate to surveying, monitoring, and reporting requirements for listed species.¹⁹⁵ The Corps committed to incorporate conditions into the Section 404 permit related to: wildlife fencing and underpasses; a site worker education program; measures protecting sea turtles, manatees, and benthic marine resources; measures protecting eastern indigo snakes; on-site speed limits; FPL's avian protection plan; wetland mitigation measures; surveys for shorebirds, wood storks, and seagrass; restoration of construction access roadways; Florida panther habitat; wood stork habitat; and relocation of listed plant species in a proposed transmission line corridor.¹⁹⁶

(2) CONSULTATIONS WITH THE NATIONAL MARINE FISHERIES SERVICE

The Staff sent its Biological Assessment to, and requested consultation with, NMFS in February 2015.¹⁹⁷ After receiving additional information from the NRC, NMFS initiated consultation in October 2016.¹⁹⁸ Consultations between the NRC and NMFS concluded in April 2017.¹⁹⁹ NMFS determined that small-tooth sawfish and five species of listed sea turtles may be present in the action area and potentially affected.²⁰⁰ NMFS agreed with the Staff that the construction and operation of the proposed units would not likely adversely affect listed species under its purview.²⁰¹ NMFS's conclusion was based, in part, on certain

¹⁹³ *Id.*, Attach. A, at 1-2; Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 46-48.

¹⁹⁴ Staff Analysis of Biological Opinion, Attach. A, at 1-2. Attachment B to the Staff Analysis of Biological Opinion shows the Staff's proposed license conditions to be added as a result of the Incidental Take Statement. "[T]he requirements in the Turkey Point Units 6 and 7 [Environmental Protection Plans] were written so that the structure and language would be consistent with previously issued [Environmental Protection Plans]." Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 48.

¹⁹⁵ Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 47.

¹⁹⁶ *Id.* at 46-47 (citing Letter from Francis M. Akstulewicz, NRC, to Ingrid Gilbert, Army Corps of Engineers (Aug. 24, 2017), Encl. 2 (ML17201Q242)); *see* Biological Opinion at 8-13. The Corps has not yet issued the Section 404 Permit.

¹⁹⁷ Letter from Jennifer Dixon-Herrity, NRC, to Miles Croom, NOAA/NMFS (Feb. 25, 2015) (ML15049A319) (enclosing Biological Assessment for the National Marine Fisheries Service (Feb. 2015) (ML15028A378)).

¹⁹⁸ Letter from Roy E. Crabtree, NOAA/NMFS, to Jennifer Dixon-Herrity, NRC, and Colonel Alan Dodd, Army Corps of Engineers (Apr. 26, 2017), at 1 (ML17143A153) (NMFS Consultation Letter).

¹⁹⁹ *Id.* at 7.

²⁰⁰ *Id.* at 4.

²⁰¹ *Id.* at 7.

project conditions.²⁰² The Staff and FPL represent that they expect the Section 404 Permit to include non-discretionary terms and conditions listed by NMFS in its consultation letter.²⁰³ For example, the Corps will include conditions to protect sea turtles and smalltooth sawfish in its Section 404 Permit.²⁰⁴ The Staff also noted its expectation that the Corps would include in its permit appropriate conditions to protect animals from injurious noise impacts.²⁰⁵

(3) AMERICAN CROCODILE

Unlike other sites recently reviewed in conjunction with a combined license application, the Turkey Point site contains federally designated critical habitat for a listed species under the Endangered Species Act.²⁰⁶ In particular, the site contains critical habitat for the threatened American crocodile (*Crocodylus acutus*).²⁰⁷ The entire proposed plant area for Units 6 and 7, as well as much of the Industrial Wastewater Facility, falls within the designated critical habitat.²⁰⁸ Potential impacts of the project include the permanent loss of 270 acres of critical habitat and adverse effects to approximately 211 acres of additional critical habitat as a result of relocating soils and other solid material from the power block area.²⁰⁹

The Staff concluded that the lost critical habitat represents approximately 0.09 percent of total crocodile terrestrial habitat available in South Florida.²¹⁰ In addition, the area that would be permanently lost is in an area that is generally considered to be low-quality crocodile habitat and is not actively used by crocodiles.²¹¹ The FWS concluded that the project would be expected to result in the incidental take of crocodiles in the form of harm from habitat loss and injuries or death from vehicle collisions.²¹² In terms of habitat loss, the FWS

²⁰² *Id.*; see also *id.* at 2-4, 5 (discussing the project description and construction conditions).

²⁰³ Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 44-45; Ex. FPL-003, FPL Pre-Hearing Responses, at 52.

²⁰⁴ Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 44 (citing NMFS Consultation Letter at 4 (referencing, in turn, the implementation of NMFS's *Sea Turtle and Smalltooth Sawfish Construction Guidelines*)).

²⁰⁵ *Id.*, Attach., at 44-45.

²⁰⁶ Ex. NRC-001, Staff Information Paper, at 26.

²⁰⁷ *Id.*

²⁰⁸ *Id.* The plant area for Units 6 and 7 is located within the Industrial Wastewater Facility and is surrounded by cooling canals. Ex. NRC-008A-A, Final Safety Analysis Report, at 2CC-12.

²⁰⁹ Ex. NRC-001, Staff Information Paper, at 26.

²¹⁰ *Id.*

²¹¹ *Id.* The land that would be adversely affected by the addition of soils and other material was selected because it does not contain suitable nesting substrate for crocodiles. *Id.*

²¹² Biological Opinion at 49.

stated that it is difficult to quantify the amount of harm because the number of individual crocodiles affected will vary over time, depending on the suitability of the habitat for nesting and foraging, the fact that not all crocodiles nest every year, and the density of nesting being highly variable.²¹³ The FWS determined that this level of anticipated take, however, is not likely to result in jeopardy to the crocodile.²¹⁴

d. Concerns of Sister Federal Agencies

During the course of its environmental review, the Staff engaged with (among others) the EPA and the National Park Service (NPS).²¹⁵ The Staff engaged regularly with the agencies through public meetings, in-person meetings, teleconferences, and correspondence.²¹⁶ Nevertheless, the EPA and NPS still had unresolved concerns related to the Final EIS.²¹⁷ Despite these concerns, the Staff

²¹³ *Id.* The FWS noted that FPL currently conducts habitat management along the banks of the cooling canals and within the Everglades Mitigation Bank to enhance nesting opportunities for crocodiles within these areas of critical habitat. *Id.* at 33.

²¹⁴ *Id.* at 51.

²¹⁵ Ex. NRC-012, NRC Post-Hearing Responses, at 5. As noted above, NPS served as a cooperating agency for preparation of the project's EIS.

²¹⁶ *Id.*; Tr. at 172 (Ms. Williamson), 173 (Ms. Williamson), 174 (Mr. Barnhurst). For example, NRC and NPS staff met with State and local authorities to discuss FPL's plans to use reclaimed water for cooling and radial collector wells that would withdraw water from underneath Biscayne Bay as a backup source of cooling water. Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 24-25.

²¹⁷ See Letter from G. Alan Farmer, EPA, to Cindy Bladley, NRC (Dec. 22, 2016), at 2 ("The EPA has several environmental concerns that were not adequately addressed in the FEIS. Of greatest concern are the project's potential impacts related to wetlands, groundwater, drinking water, Underground Injection Control (UIC) permits, impacts to [Biscayne National Park] and other aquatic preserves, environmental justice (EJ) and potential hurricane and severe storm impacts.") (ML17010-A034) (EPA Letter); Letter from Stan Austin, DOI/NPS, to Frank Akstulewicz, NRC, and Colonel Jason Kirk, Army Corps of Engineers (Dec. 19, 2016), at 1 ("We appreciate the extensive work done by the NRC and the [Corps] staff and their willingness to meet extensively with the NPS. However, the NPS continues to have serious concerns regarding the adequacy and accuracy of the [Final EIS].") (ML17006A137) (NPS Letter).

The Staff attributed some of the concerns to the different missions of the agencies. Tr. at 171 (Ms. Williamson). Other comments were not strictly within the scope of the combined license review. For example, the agencies expressed concerns related to environmental impacts of the hypersaline plume underneath the Turkey Point site; those impacts are associated with the operating units and would occur whether or not Units 6 and 7 are built. *Id.* at 175 (Mr. Barnhurst). The Staff did consider the current operation of the existing Turkey Point units and the hypersaline plume underneath the cooling canal system in its evaluation of the site selection process and in the comparison of the sites. Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 36. Section 7.2 of the Final EIS

(Continued)

stands by its determination that the Final EIS is adequate and satisfies NEPA and the NRC's implementing regulations in 10 C.F.R. Part 51.²¹⁸

The Staff nonetheless conducted additional water modeling analysis as a result of the agencies' stated concerns.²¹⁹ Staff from the NRC and NPS met with the U.S. Geological Survey and the Pacific Northwest National Laboratory to generate input and output parameters for a model used in the Draft EIS that evaluated the surface and ground water effects of the operation of radial collector wells on the surrounding hydrological environment, including Biscayne and Everglades National Parks.²²⁰ Based on feedback from NPS and others, the Staff performed a more extensive groundwater modeling study for the Final EIS.²²¹ NPS experts were directly involved throughout this effort.²²²

In addition, the Staff performed additional analysis in response to EPA and NPS concerns related to the potential for prolonged operation of radial collector wells.²²³ Although the FDEP's Conditions of Certification limit FPL's use of the radial collector well system to sixty days per year, the Staff considered a scenario where the system would operate continuously as part of its bounding sensitivity analysis.²²⁴ The sensitivity analysis indicated that there would be only minor changes to water chemistry and availability between the "no operation," "60-day," "90-day," and "continuous operation" scenarios.²²⁵ And since neither the primary (reclaimed water) nor backup water (radial collector wells) supply is safety-related, the wells would not be relied upon in the event of a transient or emergency condition.²²⁶

C. Findings

We now turn to the findings necessary for the issuance of the combined licenses. We have conducted an independent review of the sufficiency of the Staff's safety findings. Although our decision today highlights the topics dis-

discusses specific impacts to surface and groundwater as a result of cumulative impacts from the proposed units and the existing units' use of the cooling canal system. *Id.* The hypersaline plume was also considered in the evaluation of the impacts of operating the radial collector wells for Units 6 and 7 because the wells would draw a small portion of water from the Biscayne Aquifer — the same aquifer that is impacted by the plume. *Id.*

²¹⁸ Ex. NRC-012, NRC Post-Hearing Responses, at 5.

²¹⁹ Tr. at 171-72 (Ms. Williamson), 174-75 (Mr. Barnhurst).

²²⁰ Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 24-25.

²²¹ *Id.*, Attach., at 25.

²²² *Id.*

²²³ EPA Letter, Attach., at 3; NPS Letter at 5-6.

²²⁴ Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 27.

²²⁵ *Id.* (citing Ex. NRC-007, Final EIS, app. G.3.2).

²²⁶ *Id.*

cussed above, our findings are based on the entire record. Based on the evidence presented in the uncontested hearing, including the Staff's safety and environmental review documents and the testimony provided, we find that the applicable standards and requirements of the AEA and NRC regulations have been met. The required notifications to other agencies or bodies have been duly made.²²⁷ We find that FPL is technically and financially qualified to engage in the activities authorized.²²⁸ We further find that there is reasonable assurance that the facility will be constructed and operated in conformity with the license, the provisions of the AEA, and the NRC's regulations, and that issuance of the licenses will not be inimical to the common defense and security or to the health and safety of the public. In addition, we find that the proposed regulatory exemptions meet the standards in 10 C.F.R. § 50.12. Moreover, we find that the proposed license conditions are appropriately drawn and sufficient to provide reasonable assurance of adequate protection of public health and safety.

We also conducted an independent review of the Staff's environmental analysis in the Final EIS, taking into account the particular requirements of NEPA. NEPA section 102(2)(A) requires agencies to use "a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts" in decision-making that may impact the environment.²²⁹ We find that the environmental review team used the systematic, interdisciplinary approach that NEPA requires.²³⁰

NEPA Section 102(2)(C) requires us to assess the relationship between short-term uses and long-term productivity of the environment (including consideration of the benefits of operating the new units), to consider alternatives, and to describe the unavoidable adverse environmental impacts and the irreversible and irretrievable commitments of resources associated with the proposed action.²³¹ The discussion of alternatives is in Chapter 9 of the Final EIS; the other items

²²⁷ The Staff notified the Florida Public Service Commission (FPSC) about the combined license application in August 2016. Ex. NRC-001, Staff Information Paper, at 27. In addition, the Staff published notices of the application in the *Total Leader* and *South Dade New Leader* in July 2008. *Id.* The Staff also published notices of the application in the *Federal Register* on November 18, 2011, November 25, 2011, December 2, 2011, and December 9, 2011 (at 76 Fed. Reg. 71,608; 76 Fed. Reg. 72,725; 76 Fed. Reg. 75,566; and 76 Fed. Reg. 77,021, respectively). See 10 C.F.R. § 50.43(a).

²²⁸ For a discussion of construction cost estimates, see Ex. FPL-003, FPL Pre-Hearing Responses, at 1-3; Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 2-3; Tr. at 73-74 (Mr. Mussatti).

²²⁹ 42 U.S.C. § 4332(2)(A).

²³⁰ See, e.g., Tr. at 58-67 (Ms. Dixon-Herrity) (providing an overview of the Staff's environmental review methodology); Ex. NRC-009, Staff Overview Presentation, at 9-15. See note 154 for more information on the environmental review team.

²³¹ 42 U.S.C. § 4332(2)(C).

are discussed in Chapter 10.²³² The review team found the principal short-term benefit of the project to be the production of electrical energy.²³³ The review team also noted that, because the environmental analysis focused on the expansion of electrical generating capacity at the Turkey Point site, the benefits analysis focused on the benefits of building Units 6 and 7 rather than on the more generic benefits of electrical supply.²³⁴ And the review team found that construction and operation of Turkey Point Units 6 and 7, because they are nuclear units, would have two primary societal benefits: long-term price stability and energy security through fuel diversity.²³⁵ The review team found the project would have regional benefits, including enhanced tax revenues, regional productivity, and community impacts.²³⁶

NEPA section 102(2)(E) calls for agencies to study, develop, and describe appropriate alternatives.²³⁷ The alternatives analysis is the “heart of the environmental impact statement.”²³⁸ Based on the discussion in the Final EIS and the Staff’s testimony, we find that the Staff identified an appropriate range of alternatives with respect to alternative power sources, alternative sites, and alternative system designs, and it adequately described the environmental impacts of each alternative.²³⁹ We find that the Staff reasonably concluded that none of the alternatives considered is environmentally preferable to the proposed action.²⁴⁰

Chapter 10 of the Final EIS includes tables listing the unavoidable adverse environmental impacts during pre-construction, construction, and operation, along with actions to mitigate those impacts.²⁴¹ The review team found that the unavoidable impacts during pre-construction and construction would be small for the following resource areas: water use, water quality, demography, meteorology and air quality, nonradiological health, radiological health, and nonradioac-

²³² Ex. NRC-007, Final EIS, chs. 9-10.

²³³ *Id.* at 10-18. While the need for power analysis in the Final EIS was based on a 2008 determination of need from the FPSC, the FPSC continuously updates its analyses and has not reconsidered its determination of need for the two AP1000 units at Turkey Point. Ex. NRC-005-R, Staff Pre-Hearing Responses, Attach., at 35.

²³⁴ Ex. NRC-007, Final EIS, at 10-18.

²³⁵ *Id.* at 10-18 to 10-20.

²³⁶ *Id.* at 10-20 to 10-21.

²³⁷ 42 U.S.C. § 4332(2)(E).

²³⁸ 10 C.F.R. pt. 51, app. A, § 5.

²³⁹ *See, e.g.*, Ex. NRC-001, Staff Information Paper, at 31; Ex. NRC-007, Final EIS, ch. 9; Ex. NRC-004, Draft Summary Record of Decision for Turkey Point Nuclear Plant, Units 6 and 7 (Dec. 2, 2016), at 5-9 (ML17348A659).

²⁴⁰ *See* Ex. NRC-007, Final EIS, at 9-30 to 9-33 (summary of alternative power sources), 9-244 to 9-249 (summary of alternative sites), 9-258 (summary of system design alternatives).

²⁴¹ *Id.* tbls.10-1 & 10-2.

tive waste.²⁴² The review team found that there would be no adverse impacts that affect minority or low-income populations in a disproportionate manner, relative to the general population.²⁴³ The pre-construction and construction impacts for land use, ecological (terrestrial) resources, and historic and cultural resources would be moderate, but when considering NRC-authorized construction activities only, the impacts would be small.²⁴⁴ The pre-construction and construction impacts to ecological (aquatic) resources would be small to moderate.²⁴⁵ The physical impacts and impacts to infrastructure and community service would range from adverse and small to beneficial and moderate.²⁴⁶ And finally the economic impacts on the community would be beneficial and small.²⁴⁷

For operation, the review team found that the unavoidable adverse impacts would be small for the following resource areas: water use; water quality; ecological (aquatic) resources; demography; historic and cultural resources; meteorology and air quality; nonradiological health; radiological health; fuel cycle, transportation, and decommissioning; and nonradioactive waste.²⁴⁸ There would continue to be no adverse impacts that affect minority or low-income populations in a disproportionate manner, relative to the general population.²⁴⁹ The impacts to land use and ecological (terrestrial) resources would be moderate.²⁵⁰ For operation, the physical impacts and impacts to infrastructure and community service would continue to range from adverse and small to beneficial and moderate.²⁵¹ And finally the economic impacts on the community due to operation would remain beneficial and small.²⁵²

With regard to irreversible and irretrievable commitments of resources, the review team concluded that the land used for Units 6 and 7 can be returned to other uses in the future after the units cease operation and are decommissioned.²⁵³ In terms of water use, withdrawals of groundwater from the Biscayne Aquifer are reversible because the water in the aquifer is replenished by infiltration of precipitation.²⁵⁴ With respect to both aquatic and terrestrial biota, construction

²⁴² *Id.* tbl.10-1.

²⁴³ *Id.*

²⁴⁴ *Id.*

²⁴⁵ *Id.*

²⁴⁶ *Id.*

²⁴⁷ *Id.*

²⁴⁸ *Id.* tbl.10-2.

²⁴⁹ *Id.*

²⁵⁰ *Id.*

²⁵¹ *Id.*

²⁵² *Id.*

²⁵³ *Id.* at 10-15.

²⁵⁴ *Id.*

activities would cause temporary and long-term changes.²⁵⁵ Unavoidable adverse impacts on terrestrial resources and wetlands include permanent loss of mangroves and other wetland habitats and permanent loss of pine rockland and other upland habitats.²⁵⁶ Both federally and state-listed species would be affected, in addition to other important species such as wading birds.²⁵⁷ In terms of aquatic resources, there would be permanent loss of some onsite aquatic environments, including permanent loss of and adverse impacts to the critical habitat of the American crocodile.²⁵⁸

The review team also concluded that during construction of the plant, the materials used “while irretrievable, would be of small consequence with respect to the availability of such resources.”²⁵⁹ With regard to operation of the proposed units, the review team determined that uranium would be irretrievably committed, but the amount would be negligible compared to the world’s known and recoverable uranium reserves.²⁶⁰

We must weigh these unavoidable adverse environmental impacts and resource commitments — the environmental “costs” of the project — against the project’s benefits.²⁶¹ Considering the need for power in the region and the expected increase (even though relatively minor²⁶²) in productivity, jobs, and tax revenue as described in the hearing and in the Final EIS, we find that the benefits of the project outweigh the costs described above. Moreover, we have considered each of the requirements of NEPA section 102(2)(C) and find that the record supports the Staff’s conclusions on those requirements.

In sum, for each of the environmental topics discussed at the hearing and in this decision, we find that the Staff’s review was reasonably supported in logic and fact and sufficient to support the Staff’s conclusion. Based on our review, we also find that the remainder of the Final EIS was reasonably supported and sufficient to support the Staff’s conclusions.

Therefore, as a result of our review of the Final EIS, and in accordance with the Notice of Hearing for this uncontested proceeding, we find that the require-

²⁵⁵ *Id.*; see also *supra* section II.B.2.c.

²⁵⁶ Ex. NRC-007, Final EIS tbl.10-1; *id.* at 10-8.

²⁵⁷ *Id.* at 10-8.

²⁵⁸ *Id.* tbl.10-1; *id.* at 10-9; see also *supra* section II.B.2.c.3.

²⁵⁹ Ex. NRC-007, Final EIS, at 10-16.

²⁶⁰ *Id.*

²⁶¹ 10 C.F.R. § 51.107(a).

²⁶² “Because of the large Florida State, Miami-Dade County, and the Homestead and Florida City tax bases, relative to the estimated increases in revenues from operations-related activities, the review team expects the tax-related impact on these governments would likely be minor and beneficial.” Ex. NRC-007, Final EIS, at 5-85 to 5-86. The review team also concluded that the beneficial impacts from (1) annual earnings and (2) operations jobs and jobs indirectly created by the presence of an increased workforce at Units 6 and 7 would be minor. *Id.* at 5-83.

ments of NEPA section 102(2)(A), (C), and (E), and the applicable regulations in 10 C.F.R. Part 51, have been satisfied with respect to the combined license application. We independently considered the final balance among conflicting factors contained in the record of this proceeding. We find, after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, that the combined licenses should be issued.

III. CONCLUSION

For the reasons discussed above, we find that the Staff's review of FPL's combined license application was sufficient to support the findings in 10 C.F.R. §§ 52.97(a) and 51.107(a). We *authorize* the Director of the Office of New Reactors to issue the combined licenses for the construction and operation of Turkey Point Nuclear Generating Units 6 and 7. We *authorize* the Staff to issue the record of decision.

IT IS SO ORDERED.

For the Commission

Annette L. Vietti-Cook
Secretary of the Commission

Dated at Rockville, Maryland,
this 5th day of April 2018.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Kristine L. Svinicki, Chairman
Jeff Baran
Stephen G. Burns

In the Matter of

Docket No. 11006249
(License No. XW023)

UNITECH SERVICES GROUP, INC.
(Export of Low-Level Waste)

April 5, 2018

NUCLEAR NON-PROLIFERATION ACT: HEARING REQUEST

To obtain a hearing in a nuclear export proceeding, petitioners must successfully explain why a hearing would be in the public interest and how a hearing would assist the Commission in making the required statutory determinations.

NUCLEAR NON-PROLIFERATION ACT: HEARING REQUEST

To obtain a hearing in a nuclear export proceeding, petitioners must show that a hearing would bring new information to light.

MEMORANDUM AND ORDER

I. INTRODUCTION

Nuclear Information and Resource Service, Beyond Nuclear, the Nuclear Energy Information Service, Tennessee Environmental Council, and Citizens for Alternatives to Chemical Contamination (collectively, Petitioners) request leave to intervene on an export license application filed by UniTech Services

Group, Inc.¹ UniTech seeks to export up to 10,000 metric tons of byproduct material in the form of radioactively contaminated solids, metallic oxides, and other chemical forms to its customers in Canada. Petitioners seek a public hearing on UniTech’s export license application, and they ask the NRC to reject the proposed export license. Petitioners further argue that the NRC violated its own regulations by not requiring UniTech to obtain a specific license to import this material. For the reasons discussed below, we deny Petitioners’ request for a hearing and we reject Petitioners’ argument that UniTech needs a specific license to bring this material into the United States.

II. BACKGROUND

In October 2016, UniTech simultaneously submitted to the NRC two license applications. The first application sought a license for UniTech to import from Canada up to 10,000 tons of tools, metals, and other solid materials contaminated with both byproduct material and special nuclear material. UniTech’s second application sought a license to export back to UniTech’s customers in Canada the radioactive waste remaining after processing and recycling the imported materials that are suitable for unrestricted use.²

The NRC Staff determined that UniTech’s proposed import activities did not require a specific license because these activities are already authorized under a general license. The Staff, therefore, returned UniTech’s import application without action.³ The NRC noted the return of UniTech’s import application in the Federal Register and explained that UniTech’s export application was “the only regulatory action pending before the NRC.”⁴ Petitioners thereafter submitted their hearing request.⁵ Separately — and outside of the adjudicatory

¹ See Petition for Leave to Intervene against Specific Export License Issuance to UniTech Service Group, Inc. and Request for Adjudicatory Hearing (May 5, 2017) (ADAMS accession no. ML17125A347) (Petition); Application for NRC Export, License No. XW023 (Oct. 27, 2016) (ML17024A270).

² Request for a License to Export Radioactive Waste, 82 Fed. Reg. 10,919 (Feb. 16, 2017) (corrected, 82 Fed. Reg. 12,641 (Mar. 6, 2017)). The NRC also forwarded UniTech’s export application to the Executive Branch, and the Executive Branch provided its views via a letter dated December 20, 2016.

³ Letter from David Skeen, NRC, to Glenn Roberts, UniTech (Mar. 30, 2017) (ML17086A272).

⁴ Request for a License to Export Radioactive Waste, 82 Fed. Reg. 16,636, 16,636 (Apr. 5, 2017).

⁵ Petition for Leave to Intervene Against Specific Export License Issuance to UniTech Service Group, Inc. and Request for Adjudicatory Hearing (May 5, 2017) (ML17125A347); Answer to Petition for Leave to Intervene and Hearing Request Filed by [Nuclear Information and Resource Service], Beyond Nuclear, [Nuclear Energy Information Service.], [Tennessee Environmental Council],

(Continued)

process — the NRC received four sets of written comments opposing UniTech’s export application.⁶

Petitioners seek a public adjudicatory hearing before an Atomic Safety and Licensing Board.⁷ Petitioners further request that the NRC reject UniTech’s export application for its failure to describe the material to be exported in sufficient detail.⁸ Finally, Petitioners argue that the Staff improperly granted UniTech a “*de facto* general import license” to import radioactive waste when it returned UniTech’s import application without action.⁹ As discussed below, we deny Petitioners’ hearing request.

III. PETITIONERS’ HEARING REQUEST

A. Requirements for Obtaining a Hearing on an Export License

Initially, we note that Petitioners offer contentions and attempt to satisfy the requirements for intervention contained in 10 C.F.R. Part 2, Subpart C. Those standards, however, apply only to domestic licensing proceedings. For export licensing proceedings, 10 C.F.R. Part 110, Subpart H applies.¹⁰ As we recently explained, in export licensing proceedings, we allow for public participation when we find that such participation will be in the public interest and will assist us in making the statutory determinations required by the Atomic Energy Act.¹¹

and [Citizens for Alternatives to Chemical Contamination] (June 2, 2017) (ML17153A347); Reply in Support of Petition to Intervene (June 12, 2017) (ML17163A449). UniTech also seeks to strike portions of Petitioners’ reply. Motion to Strike Portions of Reply (June 16, 2017) (ML17167A337); Reply in Opposition to UniTech Motion to Strike Portions of Reply (June 21, 2017) (ML17172A751). We decline to address UniTech’s motion to strike and consider all the pleadings as a matter of discretion.

⁶ Comments from the Western New York Environmental Alliance on UniTech Services Group, Inc.’s Request for a License to Export Radioactive Waste (May 4, 2017) (ML17129A207); Comments from the Sierra Club Niagara Group on UniTech Services Group, Inc.’s Request for a License to Export Radioactive Waste (May 4, 2017) (ML17129A205); Comments from the Great Lakes Environmental Alliance, *et al.* on UniTech Services Group, Inc.’s Request for a License to Export Radioactive Waste (May 5, 2017) (ML17129A365); Comments from Congressman Brian Higgins on UniTech Services Group, Inc.’s Request for a License to Export Radioactive Waste (May 5, 2017) (ML17129A208).

⁷ Petition at 1.

⁸ *Id.* at 7-12.

⁹ *Id.* at 12-20.

¹⁰ 10 C.F.R. § 110.80 (“The procedures in this part will constitute the exclusive basis for hearings on export and import license applications.”).

¹¹ *U.S. Department of Energy* (Export of 93.20% Enriched Uranium), CLI-16-15, 84 NRC 53, 56 (2016) (quoting 42 U.S.C. § 2155a). These procedures are contained in 10 C.F.R. Part 110, Subpart H.

Hearing requests in export cases must “explain why a hearing or an intervention would be in the public interest and how a hearing or intervention would assist the Commission in making the [required statutory] determinations.”¹² We consider these factors in deciding whether to grant or deny a hearing request.¹³

Our regulations further provide that a hearing request must “specify, when a person asserts that his interest may be affected, both the facts pertaining to his interest and how it may be affected[.]”¹⁴ “If a hearing request or intervention petition asserts an interest which may be affected, the Commission will consider:

- (1) The nature of the alleged interest;
- (2) How that issue relates to issuance or denial; and
- (3) The possible effect of any order on that interest, including whether the relief requested is within the Commission’s authority, and, if so, whether granting relief would redress the alleged injury.”¹⁵

As we have explained, persons without an affected interest are not as likely as persons with an affected interest to contribute to our decision-making by showing that a hearing would be in the public interest and assisting us in making the statutory determinations.¹⁶ We first consider Petitioners’ assertion of an interest, and then we address whether Petitioners have shown that a hearing would be in the public interest and would assist us in making the required statutory and regulatory determinations.¹⁷

B. Analysis of Petitioners’ Hearing Request

Petitioners assert that their individual members live or commute near areas where the material will be processed or transported. Petitioners cite various harms that their individual members may suffer if the NRC grants this export license: being stuck in traffic next to UniTech’s cargo trucks, “chance highway encounters” with UniTech’s trucks, and general environmental degradation resulting from leaks or accidents involving UniTech’s trucks.¹⁸ Petitioners further

¹² 10 C.F.R. § 110.82(b)(3).

¹³ *Id.* § 110.84(a).

¹⁴ *Id.* § 110.82(b)(4).

¹⁵ *Id.* § 110.84(b).

¹⁶ See *U.S. Department of Energy* (Plutonium Export License), CLI-04-17, 59 NRC 357, 367 (2004).

¹⁷ In their effort to comply with Part 2’s hearing requirements, Petitioners sought to demonstrate standing consistent with those rules. We consider Petitioners’ standing arguments under the “interest” provisions of section 110.84(b).

¹⁸ Petition at 3.

assert harm from UniTech's processing this material before it is exported back to Canada.¹⁹ Finally, Petitioners claim harm from a potential fire at one of the recycling facilities.²⁰

Although Petitioners have articulated the nature of their interests, those interests do not bear a sufficient nexus to the proposed export of low-level waste to Canada to satisfy the other elements we consider when assessing an asserted interest that may be affected by a proceeding. Petitioners' asserted harms relate to activities that are separately authorized by domestic possession and transportation licensing. To show an interest that may be affected by this proceeding, Petitioners must assert that granting the export itself could cause them harm. Denying this export license will not hinder UniTech's ability to operate its domestic recycling plants because those activities are separately authorized. Nor would denial interfere with UniTech's ability to domestically transport low-level radioactive waste. As a result, we conclude that Petitioners have not demonstrated that they possess an interest that may be affected by this export licensing proceeding.

Additionally, Petitioners have not demonstrated that granting an adjudicatory hearing would be in the public interest and would assist us in making the required statutory and regulatory determinations. As we recently explained, to satisfy these factors, a petitioner must show how a hearing would bring new information to light.²¹

Petitioners first assert various omissions in UniTech's export application — specifically, UniTech's failure to characterize the waste material being exported to Canada. But UniTech's export application incorporates by reference information from the now-returned import application (specifically, the import license application lists all the radionuclides to be exported, along with the maximum quantities for each radionuclide).²² The export application, therefore, contains

¹⁹ *Id.*

²⁰ Reply at 3.

²¹ *U.S. Department of Energy*, CLI-16-15, 84 NRC at 58 (citing *U.S. Department of Energy*, CLI-04-17, 59 NRC at 369 ("Petitioners have already submitted detailed information as to the basis for their position. We do not believe a hearing will result in significant new information that is not already available to and considered by the Commission in making the requisite statutory determinations."); *Transnuclear* (Export of 93.3% Enriched Uranium), CLI-00-16, 52 NRC 68, 72 (2000) (same).

²² Even though the Staff returned UniTech's import application without action, it remains as a document in public ADAMS. Further, the Staff has placed UniTech's import application into the export licensing docket and provided notice on the adjudicatory docket that the export application continues to incorporate by reference information contained in the returned import application. See Memorandum to the Secretary from the Office of International Programs (July 7, 2017) (ML17193A272). Applicants frequently incorporate by reference certain material in our proceedings. See, e.g., *Duke*

(Continued)

the specific information required by 10 C.F.R. § 110.32. Petitioners have not shown that an actual omission exists with respect to UniTech's application nor have they demonstrated with their first argument that a hearing would be in the public interest.

Petitioners' second argument centers on its concern that the material UniTech plans to import under the general license provision is "radioactive waste" which requires a specific license.

Petitioners maintain that the NRC granted a "*de facto* general import license" that allowed UniTech to improperly import radioactive waste into the United States.²³ Essentially, Petitioners contend that because UniTech plans to bring radioactive material into the United States for processing, it must have a specific license.²⁴ By rule, however, 10 C.F.R. § 110.27(a) grants a general license²⁵ to any person for the import of "byproduct, source, or special nuclear material if the U.S. consignee is authorized to receive and possess the material under the relevant NRC or Agreement State regulations." Here, UniTech, the U.S. consignee, is authorized to receive and possess this material under its existing Agreement State radioactive material licenses. Therefore, UniTech already has a general license to import the material.

Section 110.27 contains two exceptions to the general license — exceptions that, if applicable, would require an importer to seek a specific license. But neither exception applies in this case. First, section 110.27(b) provides that the general license does not authorize the import of more than 100 kilograms per shipment of source and/or special nuclear material. Here, UniTech will be importing less than fifteen grams of special nuclear material per shipment. Second, section 110.27(c) provides that the general license does not authorize the import of radioactive waste (in any quantity).

For purposes of import and export licensing, "radioactive waste" is defined in relevant part as:

[A]ny material that contains or is contaminated with source, byproduct, or special nuclear material that by its possession would require a specific radioactive material license in accordance with this Chapter *and is imported or exported for the purposes of disposal in a land disposal facility as defined in 10 CFR Part 61,*

Energy Corp. (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 336 (1999) (describing a challenge to a license application's incorporation by reference of several generic reports on the ground that the Staff was still reviewing the generic reports).

²³ Petition at 12-21.

²⁴ *Id.*

²⁵ See 10 C.F.R. § 110.19 ("A general license is effective without the filing of an application with the Commission or the issuance of licensing documents to a particular person.").

*a disposal area as defined in Appendix A to 10 CFR Part 40, or an equivalent facility.*²⁶

This definition clarifies that imported or exported material qualifies as “radioactive waste” only if three separate criteria are all met:

- (1) The material is contaminated with source, byproduct, or special nuclear material;
- (2) The material requires a specific materials possession license; and
- (3) The material is imported or exported for the purpose of disposal in a Part 61 land disposal facility, a Part 40 disposal area, or equivalent facility.²⁷

UniTech’s import activities do not satisfy the third element of the definition. As Petitioners concede, UniTech has repeatedly confirmed that “all materials that would require transfer to a land disposal facility subject to 10 [C.F.R.] Part 61 shall be returned to Canada.”²⁸ Consequently, the third element — importing the material for the purpose of disposal — is not met, and therefore UniTech is not importing “radioactive waste” under the terms of our existing regulations. Briefly stated, UniTech is not importing material that requires a specific import license, but rather is importing via a general import license byproduct material for which it already has an agreement state license to possess. The general import license is granted by operation of our regulations, without further action.

Petitioners argue that UniTech needs to import under a specific license because if the material UniTech intends to export were to remain in the United

²⁶ *Id.* § 110.2 (emphasis added).

²⁷ We substantially revised the 10 C.F.R. § 110.2 definition of “radioactive waste” in a 2010 rulemaking. Export and Import of Nuclear Equipment and Material; Updates and Clarification, 75 Fed. Reg. 44,072 (July 28, 2010). In the statements of consideration for this rule, we explained that the revised definition of radioactive waste “links the specific license requirement for the export and import of radioactive waste to those materials (in the form of waste) that require a specific license in accordance with NRC’s domestic regulations.” *Id.* at 44,073. This linkage explains why we amended its definition such that a specific export or import license was only required for radioactive material that requires a waste disposal license and is exported or imported for the specific purposes of “disposal in a land disposal facility as defined in Part 61, a disposal area as defined in Appendix A to Part 40, or an equivalent facility.” *Id.*

In the import context, the term “equivalent facility” refers to an Agreement State-licensed facility. In the export context, it refers to a foreign disposal facility that is comparable to a Part 61 disposal facility. For both exports and imports, the purpose of the phrase “equivalent facility” is to ensure the linkage between import and export licensing and domestic licensing by requiring a specific import or export license only when the applicant intends to dispose of the material in a radioactive waste site (rather than a hazardous waste site).

²⁸ Petition at 18.

States, then it would need to go to a Part 61 land disposal facility.²⁹ Petitioners are correct that if the radioactive material were retained in the United States and sent to a Part 61 disposal facility, then UniTech would need a specific import license. Petitioners are also correct that when this material is ultimately sent to Canada for disposal, it will satisfy the definition of “radioactive waste.”³⁰ But those points only serve to explain why UniTech needs a specific license to export — they have no bearing on whether UniTech’s proposed import activities required a specific license. Because UniTech does not intend to send any imported material to domestic land disposal facilities licensed under Part 61 or its equivalent, the material UniTech is importing does not meet the Part 110 definition of radioactive waste, no specific license is required, and the Staff therefore properly returned UniTech’s import application without action.

Petitioners argue, in the alternative, that the 2010 rulemaking that established this definition can be challenged at this point in time now that it is being implemented.³¹ But our rules are not subject to collateral attack during adjudicatory proceedings.³² Further, to the extent that Petitioners seek to waive — under 10 C.F.R. § 110.111 — Part 110’s definition of radioactive waste for this particular proceeding so that UniTech would need a specific import license, we find that Petitioners have not shown that the definition of “radioactive waste” fails to serve the purposes for which it was adopted.³³ We amended the definition of radioactive waste to link the specific license requirement for importing radioactive materials to those materials (in the form of waste) that require a specific license under our domestic regulations.³⁴ This case provides a clear application of the rule because UniTech does not plan to dispose of this material in a Part 61, or equivalent, facility in the United States.

Fundamentally, Petitioners’ import arguments do not relate to the questions at issue in this export proceeding, because those import-related arguments bear no relevance to the statutory determinations we must make on the proposed export. For these reasons, we deny Petitioners’ hearing request.

²⁹ *Id.* at 19.

³⁰ *Id.*

³¹ Reply at 13-14.

³² See, e.g., *American Nuclear Corp.* (Revision of Orders to Modify Source Materials Licenses), CLI-86-23, 24 NRC 704, 707 (1986) (“the Commission adheres to the fundamental principle of administrative law that its rules are not subject to collateral attack in adjudicatory proceedings.”).

³³ 10 C.F.R. § 110.111. In other waiver contexts, we have considered whether waiver proponents have shown or alleged special circumstances that were not contemplated during the rulemaking proceeding. See *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-05-24, 62 NRC 551, 559-60 (2005). Petitioners have not done so here.

³⁴ Export and Import of Nuclear Equipment and Material; Updates and Clarification, 75 Fed. Reg. 44,072, 44,073 (July 28, 2010).

IV. CONCLUSION

For the reasons discussed above, we find that a hearing in this matter would not be in the public interest and would not assist us in making the required statutory and regulatory determinations. Accordingly, we *deny* Petitioners' request for a hearing. The NRC Staff should expeditiously address the pending export license application in accordance with the NRC's regulations.

IT IS SO ORDERED.

For the Commission

Annette L. Vietti-Cook
Secretary of the Commission

Dated at Rockville, Maryland,
this 5th day of April 2018.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Kristine L. Svinicki, Chairman
Jeff Baran
Stephen G. Burns

In the Matter of

Docket No. 50-271-LT-2

**ENTERGY NUCLEAR VERMONT
YANKEE, LLC, and ENTERGY
NUCLEAR OPERATIONS, INC.
(Vermont Yankee Nuclear Power
Station)**

April 12, 2018

MEMORANDUM AND ORDER

In this license transfer proceeding involving the Vermont Yankee Nuclear Power Station, both the State of Vermont and the New England Coalition (NEC) requested a hearing and petitioned to intervene.¹ Both petitioners recently informed us that they anticipate withdrawing from this adjudicatory proceeding.² Specifically, both state that they have signed a Settlement Agreement with the Applicants³ regarding the proposed license transfer. Vermont and NEC state

¹ See State of Vermont's Petition for Leave to Intervene and Hearing Request (June 13, 2017); New England Coalition's Request for a Hearing and Petition for Leave to Intervene (June 27, 2017).

² See State of Vermont's Notice of Anticipated Withdrawal of the State's Petition for Leave to Intervene and Hearing Request (Mar. 7, 2018) (Vermont Notice); Amended Motion to Hold in Abeyance Action on New England Coalition's Petition for Leave to Intervene and Hearing Request in Consideration of Anticipated Withdrawal (Mar. 12, 2018) (NEC Amended Motion) (amending motion filed on Mar. 7, 2018).

³ Entergy Nuclear Operations, Inc., the licensed operator of the power station, filed the license transfer application on behalf of itself, Entergy Nuclear Vermont Yankee, LLC (the station's licensed owner), and the NorthStar Nuclear Decommissioning Company, LLC (together, the Applicants).

(Continued)

that they intend to formally withdraw their respective petitions to intervene and requests for hearing if the Settlement Agreement remains in place without substantial alteration.

Because the Settlement Agreement specifies a deadline and terms under which any party to the Agreement may withdraw, the petitioners have filed notices of anticipated — not immediate — withdrawal from this proceeding.⁴ NEC requests that we hold in abeyance its intervention petition and request for hearing until the Vermont Public Utility Commission “issues a final order and time for any party wishing to withdraw from the Settlement Agreement has lapsed.”⁵ NEC additionally states that it contacted counsel for the Applicants, who do not oppose NEC’s motion.

In light of the Settlement Agreement and the NEC and Vermont notices of anticipated withdrawal, and having received no objection to NEC’s motion, we grant the motion. We will hold in abeyance the NEC petition for leave to intervene and request for hearing, pending further notification from NEC, Vermont, or the Applicants, or further Commission order. Because the Vermont intervention petition and hearing request are similarly situated, we likewise hold them in abeyance. In all cases, the litigants should file a joint status report with us by no later than August 13, 2018.

IT IS SO ORDERED.

For the Commission

Annette L. Vietti-Cook
Secretary of the Commission

Dated at Rockville, Maryland,
this 12th day of April 2018.

As proposed in the application, authority to possess, maintain, and decommission the facility, including the Independent Spent Fuel Storage Facility, would transfer to NorthStar. *See* Letter from A. Christopher Bakken, III, President and Chief Executive Officer, Entergy Nuclear Operations, Inc., to NRC Document Control Desk, Application for Order Consenting to Direct and Indirect Transfers of Control of Licenses and Approving Conforming License Amendment and Notification of Amendment to Decommissioning Trust Agreement (Feb. 9, 2017), Attach. 1 at 1-2, 8 (ADAMS accession no. ML17045A140 (package)).

⁴The Settlement Agreement provides that if, by July 31, 2018, the Vermont Public Utility Commission has not issued an order that approves the proposed transaction and incorporates the terms and conditions of the Settlement Agreement substantially in their entirety without material alterations, any party to the Settlement Agreement may withdraw from it by providing written notice within 10 days of July 31, 2018, or the date the PUC issues an order. *See* Vermont Notice at 1-2 (referencing attached Settlement Agreement at 18); NEC Amended Motion at 2.

⁵NEC Amended Motion at 2.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Kristine L. Svinicki, Chairman
Jeff Baran
Stephen G. Burns

In the Matter of

Docket No. 50-443-LA-2

NEXTERA ENERGY SEABROOK, LLC
(Seabrook Station, Unit 1)

April 12, 2018

APPELLATE REVIEW

The Commission's rules of practice provide for an appeal as of right on the question whether a petition to intervene should have been wholly denied. The Commission defers to a Board's contention admissibility rulings unless the appeal points to an error of law or abuse of discretion.

CONTENTIONS, ADMISSIBILITY

The contention admissibility standards are strict by design; failure to fulfill any one of the standards renders a contention inadmissible.

LICENSING BOARDS, AUTHORITY

In determining contention admissibility, a licensing board has the authority to reformulate contentions to eliminate extraneous issues or to consolidate issues for a more efficient proceeding.

LICENSING BOARDS, AUTHORITY

***PRO SE* LITIGANTS**

The Commission's precedent allows licensing boards some latitude with re-

spect to *pro se* petitioners. A board may consider the readily apparent legal implications of a *pro se* petitioner's arguments, even if not expressly stated in the petition.

LICENSING BOARDS, AUTHORITY

The Commission expects the Board to narrow contentions to remove unnecessary issues from contentions.

MEMORANDUM AND ORDER

This proceeding concerns the application of NextEra Energy Seabrook, LLC to amend the operating license for Seabrook Station, Unit 1. NextEra seeks to revise the Updated Final Safety Analysis Report (UFSAR) to add methods for analyzing seismic Category I structures impacted by alkali-silica reaction (ASR). In LBP-17-7, the Atomic Safety and Licensing Board granted the hearing request of the C-10 Research & Education Foundation, Inc.¹ NextEra appeals LBP-17-7. As discussed below, we affirm the Board's decision.

I. BACKGROUND

A. ASR and Its Effects at Seabrook

ASR, a chemical reaction in susceptible concrete, occurs "when reactive silica in the aggregate reacts with hydroxyl ions (OH⁻) and alkali ions (Na⁺, K⁺) in the pore solution. The reaction produces an alkali-silicate gel that expands as it absorbs moisture, exerting tensile stress on the surrounding concrete and resulting in cracking."² ASR can potentially affect the structural capacity of concrete structures.³ In particular, ASR may impact the material properties of the concrete, potentially affecting the load-bearing capacity of the structure.⁴ Additionally, concrete expansion from ASR can cause deformation of the structure

¹ LBP-17-7, 86 NRC 59, 137 (2017).

² License Amendment Request 16-03 — Revise Current Licensing Basis to Adopt a Methodology for the Analysis of Seismic Category I Structures with Concrete Affected by Alkali-Silica Reaction (Aug. 1, 2016) (ADAMS accession no. ML16216A250 (package)) (LAR), Encl. 2, MPR-4288, "Seabrook Station: Impact of Alkali-Silica Reaction on Structural Design Evaluations," rev. 0 (July 2016), § 1.2.1 (ML16216A241) (non-proprietary version) (MPR-4288).

³ LAR, Encl. 7, NextEra Energy Seabrook's Evaluation of the Proposed Change (Aug. 1, 2016), § 1.0 (ML16216A240) (non-proprietary version) (LAR Evaluation).

⁴ *Id.* § 2.1.

and may lead to stresses due to internal or external resistance to expansion.⁵ The resulting deformation of the structure can increase the load or demand on the structure, affecting its seismic isolation.⁶ The methodology changes proposed in the license amendment application at issue here are intended to account for “the design basis of the containment building and other seismic Category I structures that are affected by ASR” at Seabrook.⁷

Our regulations require that nuclear power plant structures, systems, and components (SSCs) important to safety be designed to withstand the effects of earthquakes and other natural phenomena without loss of their safety functionality.⁸ “Category I structures” are those that must remain functional during a safe shutdown earthquake.⁹ According to NextEra, seismic Category I structures aside from the containment building were initially designed to comply with American Concrete Institute (ACI) 318-71, “Building Code Requirements for Reinforced Concrete,” and the containment building was initially designed according to section III of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code.¹⁰ Neither ACI 318-71 nor the ASME code includes methodology for analyzing structures affected by ASR.¹¹

NextEra initially detected ASR-related cracking in several Category I seismic structures at Seabrook in 2009.¹² When investigating the cause of the cracking, NextEra found that the original concrete mix used at Seabrook was susceptible to ASR.¹³ This susceptibility, exacerbated by groundwater intrusion, led to the development of ASR in a number of structures.¹⁴ In 2012, NextEra completed an interim assessment of the structural adequacy of reinforced concrete structures affected by ASR.¹⁵ The assessment revealed that the structures remained adequate for use in the short term; additional testing was necessary, however, to confirm that certain structures met design requirements.¹⁶ Two years later,

⁵ *Id.* Internal resistance is caused by reinforcement, and external resistance is caused by supports, other structures, or portions of the same structure unaffected by ASR. *Id.*

⁶ *Id.*

⁷ LAR, Letter from Ralph A. Dodds III, Plant General Manager, NextEra Energy Seabrook, to NRC Document Control Desk (Aug. 1, 2016), at 1 (ML16216A240).

⁸ 10 C.F.R. pt. 50, app. A, criterion 2.

⁹ See “Seismic Design Classification for Nuclear Power Plants,” Regulatory Guide 1.29, rev. 5 (July 2016), at 5 (ML16118A148).

¹⁰ LAR Evaluation §§ 1.0, 2.2.

¹¹ *Id.*

¹² *Id.* § 2.1.

¹³ *Id.*

¹⁴ *Id.*

¹⁵ *Id.* § 2.1.1; see MPR-3727, “Seabrook Station: Impact of Alkali-Silica Reaction on Concrete Structures and Attachments,” rev. 1 (May 2012) (ML12151A397) (MPR-3727).

¹⁶ LAR Evaluation § 2.1.1; see MPR-3727 at iv-v.

NextEra discovered damage to the vertical seismic gap seal between the containment enclosure building and the containment building. NextEra attributed the damage to deformation of the containment enclosure building resulting from concrete expansion.¹⁷

NextEra has evaluated the effects of ASR on the operability of SSCs at Seabrook and has determined that ASR-affected structures and concrete anchors are degraded but operable and that SSCs within the same structures are operable.¹⁸ NextEra is performing an ongoing verification that structures continue to satisfy ACI 318-71 and ASME Code acceptance criteria with the additional demand caused by ASR-induced concrete expansion.¹⁹

But test data regarding ASR's effects on structures is limited. Currently, research is focused on the science of ASR rather than on engineering and structural implications.²⁰ NextEra therefore undertook a large-scale test program that "included testing of specimens that reflected the characteristics of ASR-affected structures at Seabrook."²¹ MPR Associates, a consultant to NextEra, conducted the large-scale test program at the Ferguson Structural Engineering Laboratory (FSEL). The tests were conducted at a variety of different levels of ASR, which demonstrated the impact on specific "limit states."²² NextEra informed the Staff that "[t]he results of the test program demonstrated that none of the assessed limit states are reduced by ASR when ASR expansion levels in plant structures are below those evaluated in the large-scale test program[]." ²³

Relying on available scientific literature and the results of the large-scale test program, NextEra has submitted a license amendment request to account for the effects of ASR in the design basis of seismic Category I reinforced structures at Seabrook in August 2016.²⁴ In its request, NextEra proposes several

¹⁷ LAR Evaluation § 2.1.1.

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ *Id.* § 3.2.1.

²¹ *Id.* The license amendment request refers to the "large-scale test program" and "large-scale test programs" interchangeably; the Board used "large-scale test program." LBP-17-7, 86 NRC at 70 n.20 (citing LAR Evaluation § 3.2). We use the same terminology.

²² LAR Evaluation § 3.2.1. The Board defined a "limit state" as "a condition of a structure beyond which it no longer fulfills the relevant design criteria." LBP-17-7, 86 NRC at 70. NextEra stated that the test program assessed all relevant limit states — flexure and reinforcement anchorage, shear, and anchor bolts and structural attachments to concrete — aside from compression. LAR Evaluation § 3.2.1. NextEra also submitted with its license amendment request a report discussing ASR's impact on all structural limit states, including compression. *Id.*; see MPR-4288 § 5.3.

²³ LAR Evaluation § 3.2.1.

²⁴ *Id.* § 2.1.1; see Supplement to License Amendment Request 16-03 Revise Current Licensing Basis to Adopt a Methodology for the Analysis of Seismic Category I Structures with Concrete Affected by Alkali-Silica Reaction (Sept. 30, 2016) (ML16279A047 (package)) (LAR Supplement).

modifications to the Seabrook UFSAR to account for loads from ASR expansion in design calculations.²⁵ These proposed changes would alter the licensing basis to account for ASR in seismic Category I structures and set limits for allowable ASR expansion, as well as recommend criteria for monitoring future changes due to ASR expansion and related structural deformation.²⁶

B. Procedural History

The Staff published a notice of opportunity to request a hearing on the license amendment request in February 2017.²⁷ In response, C-10 filed a hearing request and proposed ten interrelated contentions.²⁸ NextEra and the Staff opposed the hearing request on the basis that C-10 had not demonstrated standing.²⁹ NextEra further argued that none of C-10's proposed contentions were admissible, while the Staff proposed a single reformulated contention from portions of six of C-10's proposed contentions.³⁰ NextEra opposed the Staff's reformulated contention; C-10 did not object to it.³¹ The Board heard oral argument on standing and contention admissibility on June 29, 2017.³²

In LBP-17-7, the Board concluded that C-10 had standing and admitted five

²⁵ See LAR Evaluation, Attach. 1, "Markup of UFSAR Pages" (non-proprietary version).

²⁶ LAR Evaluation § 4.2; *see also id.* § 3.2.1.

²⁷ Applications and Amendments to Facility Operating Licenses and Combined Licenses Involving Proposed No Significant Hazards Considerations and Containing Sensitive Unclassified Non-Safeguards Information and Order Imposing Procedures for Access to Sensitive Unclassified Non-Safeguards Information, 82 Fed. Reg. 9601, 9604 (Feb. 7, 2017).

²⁸ C-10 Research and Education Foundation, Inc. Petition for [L]eave to [I]ntervene (Apr. 10, 2017) (Petition).

²⁹ NextEra's Answer Opposing C-10 Research & Education Foundation's Petition for Leave to Intervene and Hearing Request on NextEra Energy Seabrook, LLC's License Amendment Request 16-03 (May 5, 2017), at 13-15 (NextEra Answer to Petition); NRC Staff's Answer to C-10 Research and Education Foundation, Inc. Petition for Leave to Intervene (May 5, 2017), at 14-23 (Staff Answer to Petition).

³⁰ NextEra Answer to Petition at 16; Staff Answer to Petition at 26, 38-39. The Staff asserted that the remaining contentions were inadmissible. Staff Answer to Petition at 39.

³¹ NextEra's Motion for Leave to File a Reply to NRC Staff's Answer to C-10's Petition for Leave to Intervene (May 12, 2017); NextEra's Reply to NRC Staff's Answer to C-10's Petition for Leave to Intervene (May 12, 2017); Tr. at 15-16; *see* Order (Granting NextEra's Motion to File a Reply) (May 26, 2017) (unpublished); *see also* NRC Staff's Motion for Leave to File a Sur-Reply to NextEra's Reply to NRC Staff's Answer to C-10's Petition for Leave to Intervene (June 5, 2017); NRC Staff's Sur-Reply to NextEra's Reply to NRC Staff's Answer to C-10's Petition for Leave to Intervene (June 5, 2017); Order (Granting the NRC Staff's Motion to File a Reply to NextEra's Response) (June 6, 2017) (unpublished).

³² *See* Tr. at 1-132.

contentions, three of which it narrowed from C-10's original proposal.³³ The Board reformulated the contentions into a single contention, holding in the alternative that even if the contentions were not independently admissible, the reformulated contention met the NRC's admissibility requirements.³⁴ The contention the Board admitted — comprised of Contentions A, B, C, D, and H — is as follows:

The large-scale test program, undertaken for NextEra at the FSEL, has yielded data that are not "representative" of the progression of ASR at Seabrook. As a result, the proposed monitoring, acceptance criteria, and inspection intervals are not adequate.³⁵

C-10's core challenge to the license amendment request is that results from the large-scale test program are not representative of conditions at Seabrook and therefore the proposed methodology is not adequate.³⁶ The five elements of the reformulated contention relate as follows. In Contention D, C-10 challenges the overall representative nature of the data from the large-scale test program.³⁷ In Contention A, as admitted, C-10 challenges the effectiveness of crack width indexing and extensometer deployment as tools for determining the presence and extent of ASR in safety-related structures.³⁸ C-10's concerns regarding these monitoring techniques arise from the question of whether the test program results can adequately predict the effectiveness of crack width indexing and extensometer deployment as monitoring techniques at Seabrook.³⁹ In Contentions B and C, taken together, C-10 contends that results gathered via the test program do not provide information comparable to that obtainable by core sampling and that, without such information, NextEra cannot understand the progression of ASR at Seabrook.⁴⁰ And finally, in Contention H, as

³³ LBP-17-7, 86 NRC at 68.

³⁴ *Id.* at 89-90.

³⁵ *Id.* at 90. The Staff argued before the Board that portions of Contention G (in which C-10 challenged the license amendment request for failing to include a "tipping point" analysis) were admissible when combined with another contention. Staff Answer to Petition at 37; *see* Petition at 13-15. The Board declined to admit Contention G on the ground that C-10 sought to "[require] a specific methodology not based on C-10's argument about the lack of representativeness of the test samples." LBP-17-7, 86 NRC at 135.

³⁶ Petition at 8.

³⁷ *Id.* at 8-11; *see* LBP-17-7, 86 NRC at 112-21.

³⁸ *See* LBP-17-7, 86 NRC at 95-102.

³⁹ *See* NRC Staff Brief in Opposition to NextEra's Appeal of LBP-17-07 (Nov. 27, 2017), at 6-7 (Staff Answer); Staff Answer to Petition at 30.

⁴⁰ Petition at 5-8; *see* LBP-17-7, 86 NRC at 105-06, 107-11; *see also* Staff Answer at 8-9; Staff Answer to Petition at 33-35.

admitted, C-10 challenges the frequency of proposed inspection intervals on the ground that the test program results on which the intervals are based are not representative of Seabrook concrete.⁴¹ In sum, each element of the reformulated contention relates to C-10's central challenge to the representative nature of the large-scale test program.

NextEra now appeals the Board's admission of the reformulated contention and argues that the hearing request should have been wholly denied.⁴² C-10 and the Staff oppose the appeal.⁴³

II. DISCUSSION

A. Standard of Review and Contention Admissibility

Our rules of practice provide for an appeal as of right on the question whether a petition to intervene should have been wholly denied.⁴⁴ We defer to a Board's contention admissibility rulings "unless the appeal points to an error of law or abuse of discretion."⁴⁵

A request for hearing must "set forth with particularity the contentions sought to be raised."⁴⁶ A petitioner must

- (i) provide a specific statement of the issue of law or fact to be raised or controverted;

⁴¹ Petition at 15-16; *see* LBP-17-7, 86 NRC at 121-25; Staff Answer at 9; Staff Answer to Petition at 38.

⁴² NextEra's Notice of Appeal of LBP-17-7 (Oct. 31, 2017); Brief in Support of NextEra's Appeal of LBP-17-7 (Oct. 31, 2017) (Appeal). NextEra does not challenge C-10's standing on appeal.

⁴³ C-10 Research and Education Foundation, Inc. Response to NextEra's Appeal of LBP-17-7: Whereby the Atomic Safety and Licensing Board Granted Standing to C-10 Research and Education Foundation to Intervene in Docket No. 50-443-LA-2 and Admitted Five of Its Contentions (Nov. 22, 2017) (C-10 Answer); Staff Answer. Although replies are not contemplated under section 2.311, NextEra nonetheless filed a reply to C-10's answer. NextEra asserts that certain of the arguments raised by C-10 in its answer associated with confirmatory testing amount to a motion to strike and should themselves be excluded, thereby styling its reply an "answer" to C-10's "de facto motion to strike." *See* NextEra's Answer to C-10's De Facto Motion to Strike (Dec. 4, 2017) (NextEra Reply). We consider NextEra's reply as a matter of discretion. We decline to strike the requested portions of C-10's answer; C-10's arguments respond to assertions made by NextEra in its initial appeal and therefore are not out of bounds.

⁴⁴ *See* 10 C.F.R. § 2.311(d)(1).

⁴⁵ *See, e.g., Tennessee Valley Authority* (Browns Ferry Nuclear Plant, Units 1, 2, and 3), CLI-17-5, 85 NRC 87, 91 (2017); *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-16-9, 83 NRC 472, 482 (2016); *Crow Butte Resources, Inc.* (Marsland Expansion Area), CLI-14-2, 79 NRC 11, 13-14 (2014).

⁴⁶ 10 C.F.R. § 2.309(f)(1).

- (ii) provide a brief explanation of the basis of the contention;
- (iii) demonstrate that the issue raised in the contention is within the scope of the proceeding;
- (iv) demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding;
- (v) provide a concise statement of the alleged facts or expert opinions which support the petitioner’s position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and documents on which the petitioner intends to rely to support its position on the issue; and
- (vi) provide sufficient information to show that a genuine dispute exists with the applicant on a material issue of law or fact. This information must include references to specific portions of the application that the petitioner disputes and the supporting reasons for each dispute, or, if the petitioner believes the application fails to contain information on a relevant matter as required by law, the identification of each failure and the supporting reasons for the petitioner’s belief.

These contention admissibility standards are “strict by design”; failure to fulfill any one of the standards renders a contention inadmissible.⁴⁷

In determining contention admissibility, a licensing board has the authority to “reformulate contentions to eliminate extraneous issues or to consolidate issues for a more efficient proceeding.”⁴⁸ Our precedent allows boards some latitude with respect to *pro se* petitioners.⁴⁹ A board may “consider the readily apparent legal implications of a *pro se* petitioner’s arguments, even if not expressly stated in the petition.”⁵⁰ This authority is limited in that the petitioner — not the board

⁴⁷ *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-01-24, 54 NRC 349, 358 (2001); see *South Carolina Electric & Gas Co.* (Virgil C. Summer Nuclear Station, Units 2 and 3), CLI-10-1, 71 NRC 1, 7 (2010).

⁴⁸ *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-15-25, 82 NRC 389, 401 (2015) (citations omitted); see *Crow Butte Resources, Inc.* (North Trend Expansion Project), CLI-09-12, 69 NRC 535, 552-53 (2009).

⁴⁹ We do not hold a *pro se* petitioner “to the same standards as parties represented by counsel.” *Turkey Point*, CLI-15-25, 82 NRC at 397. Even so, litigants are reminded that “[f]airness to all involved in NRC’s adjudicatory procedures requires that every participant fulfill the obligations imposed by and in accordance with applicable law and Commission regulations.” *Statement of Policy on Conduct of Licensing Proceedings*, CLI-81-8, 13 NRC 452, 454 (1981).

⁵⁰ LBP-17-7, 86 NRC at 92; see *Turkey Point*, CLI-15-25, 82 NRC at 397.

— must provide the information required to satisfy our contention admissibility standards.⁵¹

B. NextEra’s Appeal

One matter warrants initial mention. NextEra raises a general challenge to C-10’s support for its contentions, reiterating its argument before the Board that the materials on which C-10 relies are “outdated.”⁵² NextEra particularly challenges C-10’s reliance on Dr. Paul W. Brown’s commentary on the license amendment request because it does not take into account NextEra’s September 2016 supplement to the request.⁵³ NextEra does not call into question the Board’s consideration of Dr. Brown’s supporting information beyond repeating the argument it lodged before the Board. The Board was aware of NextEra’s objection and explained how it found Dr. Brown’s information to support various elements of C-10’s contentions.⁵⁴ And further, as C-10 notes, “much of C-10’s support is to the underlying science regarding ASR in concrete, including the analysis of the fundamentals of ASR and a discussion of ASR testing techniques.”⁵⁵ While NextEra argues generally that C-10’s support is outdated, it does not challenge the validity of the analysis contained in the documents.

Turning to the specifics of NextEra’s appeal, the Board found that the reformulated contention met the contention admissibility criteria. NextEra challenges this determination on two grounds. First, NextEra argues that the consolidation of otherwise inadmissible contentions into one admissible contention exceeded the Board’s authority. Second, NextEra asserts that the reformulated contention is inadmissible in any case. We address these arguments in turn.

⁵¹ See, e.g., *DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 2), CLI-15-18, 82 NRC 135, 145-46 (2015); *Crow Butte*, CLI-09-12, 69 NRC at 553.

⁵² Appeal at 7-8; see, e.g., NextEra Answer to Petition at 2, 16-17.

⁵³ Appeal at 8 (citing Petition at 4 (citing, in turn, Letter from Sandra Gavutis, C-10 and David Wright, Union of Concerned Scientists, to Justin Poole, NRC (Oct. 21, 2016), Encl., P.W. Brown, “Commentary on Seabrook Station License Amendment Request 16-03” (Sept. 30, 2016) (ML-16306A248) (2016 Brown Commentary))).

Dr. Brown is “a retired Professor of Ceramic Science and Engineering at Pennsylvania State University” and “an ASR concrete expert who has worked for the National Institute of Standards and Technology.” LBP-17-7, 86 NRC at 96 (citations omitted).

⁵⁴ See LBP-17-7, 86 NRC at 95-97. To the extent that NextEra takes issue with C-10’s remaining supporting documents, its challenge lacks specificity. See Appeal at 7-8.

⁵⁵ C-10 Answer at 6.

1. The Board's Authority to Narrow and Reformulate C-10's Proposed Contentions

In challenging the Board's decision to reformulate the contention, NextEra argues that the Board abused its discretion by "supplying multiple nexuses [to the license amendment request] not pled by C-10," contrary to our case law in *Fermi*.⁵⁶ Relatedly, NextEra contends that, while it had argued that a board may not supply missing information in order to render a contention admissible, the Board misunderstood its argument to mean that a board may not consider NRC precedent or regulations unless cited by the petitioner.⁵⁷ NextEra argues that the Board rejected this mischaracterized position and instead "repeatedly supplied missing arguments, nexus, or information necessary to create an admissible contention."⁵⁸

In *Fermi*, we reversed a board's contention admissibility decision on the ground that the board improperly provided the nexus between proposed contentions and the application, and itself supplied support for those contentions.⁵⁹ The Staff distinguishes *Fermi* on the basis that the Board in this case did not itself provide the nexus between the contentions and the application, supplement the contentions, or change C-10's arguments to render the contention admissible.⁶⁰ In the Staff's view, the interrelation of C-10's arguments in Contentions A, B, C, D, and H is evident based on the text of the petition.⁶¹ The Staff argues that the Board acted reasonably in reading the "representativeness" argument with C-10's remaining admissible challenges to NextEra's license amendment request.⁶²

We agree that the Board reasonably read C-10's petition holistically. Although the Board noted NextEra's apparent argument that it lacked "interpretive authority and . . . the ability to consider even controlling Commission decisions or agency regulations (i.e., legal support) unless cited by the petitioner," the Board correctly recognized that "the key limitation [of the Board's reformulation authority] is that the Board may not provide new or missing information to render a contention admissible."⁶³ The Board based its reformulation of C-10's contentions on this premise. As the Board observed, our precedent allows

⁵⁶ Appeal at 28.

⁵⁷ *Id.* at 13-14.

⁵⁸ *Id.* at 14.

⁵⁹ *Fermi*, CLI-15-18, 82 NRC at 141-50.

⁶⁰ Staff Answer at 5-6.

⁶¹ *Id.* at 6.

⁶² *Id.* at 10-11.

⁶³ LBP-17-7, 86 NRC at 91.

it to “reasonably interpret a *pro se* petitioner’s arguments.”⁶⁴ Although C-10’s petition was not a model of clarity or organization, C-10 itself advanced each of the arguments contained in the reformulated contention. Accordingly, we find the Board acted within its authority to consider the petition as a whole and to reformulate C-10’s contentions for clarity, succinctness, and efficiency.⁶⁵ The Board did not supply additional information to render C-10’s contentions admissible or otherwise bolster C-10’s arguments. The record reflects that the Board linked the implicit connections between C-10’s arguments in Contentions A, B, C, D, and H using information provided by C-10 throughout its petition. NextEra has not demonstrated otherwise.

2. *Admissibility of the Reformulated Contention*

Considering each contention admissibility factor, the Board determined that the reformulated contention is admissible even if any of its component subparts are not independently admissible. Ultimately, the Board found that “because the [license amendment request] relies on the representativeness of the large-scale test program to the Seabrook concrete in order to justify its proposed monitoring, acceptance criteria, and inspection intervals,” C-10’s challenge to the representativeness of the proposed plan raises a genuine dispute with the license amendment request’s methodology.⁶⁶ On appeal, NextEra argues that the reformulated contention does not articulate a genuine dispute with the license amendment request. NextEra asserts that the Board erroneously found “that the [request] relies on an *assumption* that the [large-scale test program] concrete is similar to Seabrook’s concrete.”⁶⁷ We understand this argument to be that the reformulated contention is inadmissible because confirmatory testing will empirically verify the representative nature of the large-scale test program.⁶⁸

NextEra does not demonstrate Board error. The Board concluded that a key element of C-10’s challenge to the methodology goes to whether the license amendment request’s approach, developed from the test program, is adequate;

⁶⁴ *Id.* at 92.

⁶⁵ See *Andrew Siemaszko*, CLI-06-16, 63 NRC 708, 720 (2006) (quoting *Virginia Electric and Power Co.* (North Anna Power Station, Units 1 and 2), LBP-84-40A, 20 NRC 1195, 1199 (1984)).

⁶⁶ LBP-17-7, 86 NRC at 131.

⁶⁷ Appeal at 29-30 (citing LBP-17-7, 86 NRC at 131).

⁶⁸ See *id.* at 18-19, 30. C-10 argues that NextEra’s arguments regarding confirmatory testing are untimely; it asserts that it “did not have any opportunity to review the materials or respond.” C-10 Answer at 2. But as NextEra notes, information regarding its proposed confirmatory testing was included in an attachment to the license amendment request. NextEra Reply at 3 & n.15; see LAR, Encl. 3, MPR-4273, “Seabrook Station — Implications of Large-Scale Test Program Results on Reinforced Concrete Affected by Alkali-Silica Reaction,” rev. 0 (July 2016), at vii, § 6.1.5 (ML16216A242) (non-proprietary version) (MPR-4273).

NextEra does not challenge this finding.⁶⁹ NextEra’s proposed confirmatory testing does not moot C-10’s concerns that the application’s methodology was derived from non-representative test specimens. Accordingly, we find that NextEra has not called into question the Board’s determination that the reformulated contention raises a genuine dispute of material law or fact.⁷⁰

In the balance of its appeal, NextEra lodges various challenges to the independent admissibility of each individual admitted contention.⁷¹ It argues that the reformulated contention “is not sufficiently supported . . . and does not identify material deficiencies in the various program elements (e.g., monitoring methodologies, acceptance criteria, and inspection intervals).”⁷² While we address NextEra’s arguments as they are presented, we need not reach the question whether Contentions A, B, C, D, and H are independently admissible. Instead, we consider the contentions as subparts of the larger reformulated contention, and we look to whether these challenged subparts, or bases, of the reformulated contention were improperly admitted.

a. Adequacy of Tools to Determine Presence and Extent of ASR

In Contention A, as admitted, C-10 challenges the effectiveness of crack width indexing and extensometer deployment as tools for determining the presence and extent of ASR in safety-related structures.⁷³ NextEra argues that this issue does not demonstrate a genuine dispute with its proposed methodology but merely advocates for C-10’s preferred approach, *in situ* material property testing.⁷⁴ NextEra supports its argument by citing our precedent in the *Seabrook* license renewal proceeding.⁷⁵ There we stated that “contentions admitted for litigation *must point to a deficiency in the application*, and not merely ‘suggestions’ of other ways an analysis could have been done.”⁷⁶

We agree with NextEra that our contention admissibility standards require

⁶⁹ See LBP-17-7, 86 NRC at 114.

⁷⁰ In its answer, C-10 challenges the frequency of NextEra’s proposed confirmatory testing. C-10 Answer at 3-4. We do not consider this argument because C-10 raises it for the first time on appeal. *USEC Inc. (American Centrifuge Plant)*, CLI-06-10, 63 NRC 451, 458 (2006).

⁷¹ Appeal at 29.

⁷² *Id.*

⁷³ Petition at 3-4; see LBP-17-7, 86 NRC at 95-102. The Board excluded the portion of Contention A contesting visual inspections as a tool for monitoring ASR on the ground that NextEra did not propose to use visual inspections as a monitoring method. LBP-17-7, 86 NRC at 95.

⁷⁴ Appeal at 20.

⁷⁵ *Id.* (citing *NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 1), CLI-12-5, 75 NRC 301, 323 (2012)).

⁷⁶ *Seabrook*, CLI-12-5, 75 NRC at 323 (emphasis added).

more than identification of a desired result.⁷⁷ But as the Board explained, C-10 expressed its concerns with NextEra's proposed use of crack index data and extensometers in its original petition.⁷⁸ C-10 supported this argument with Dr. Brown's opinion that "[a] crack index that only considers crack width is not an appropriate measure of an expansive reaction in a structure restrained by reinforcement" and that an index reflecting crack length more reliably indicates the extent of ASR.⁷⁹ And its concerns regarding extensometers are supported by Dr. Brown's commentary on the license amendment request, in which he asserted that "[extensometers] can only provide information as to the overall dimensional change; they cannot determine the specific locations of expansion. Consequently, very localized and intensely damaging expansion could occur in planes parallel to the planes of the walls which would not result in a significant through-wall dimensional change."⁸⁰ Based on Dr. Brown's opinion, C-10 contended that "[e]xtensometers can completely miss localized damage propagating in-plane from ASR."⁸¹ C-10 therefore has articulated specific concerns with the monitoring techniques proposed in the license amendment request; C-10 challenged the reliability of crack index data and the utility of extensometers in determining the location of expansion.⁸² Accordingly, we find no Board error on this point.

NextEra also argues that this issue does not demonstrate a genuine dispute with the license amendment request because Dr. Brown's concerns relate only to "exclusive reliance on [crack width] indexing" even though the license amendment request relies on additional monitoring features.⁸³ Similarly, NextEra asserts that Dr. Brown's "comments seem to discuss the use of extensometers as a stand-alone monitoring technique" and therefore do not consider the "specific application" of extensometers in the comprehensive monitoring approach that NextEra proposes.⁸⁴ The Board found C-10's challenge to NextEra's proposed monitoring techniques to be adequately supported by Dr. Brown's opinion "that ASR expansion in reinforced concrete will eventually result in high density cracking that reduces the strength of the concrete, but such cracking may

⁷⁷ See, e.g., *USEC*, CLI-06-10, 63 NRC at 477.

⁷⁸ Petition at 3-4; see *LBP-17-7*, 86 NRC at 99-102.

⁷⁹ Petition at 3 (quoting P. W. Brown, *Commentary on "Seabrook Station: Impact of Alkali-Silica Reaction on Concrete Structures and Attachments"* (Mar. 2013), at 6 (unnumbered), <http://www.c-10.org/research/wp-content/uploads/2013/11/C-10.UCSMarch2013commentary.pdf> (2013 Brown Commentary)).

⁸⁰ *Id.* at 4 (quoting 2016 Brown Commentary at 2-3).

⁸¹ *Id.*

⁸² *Id.* at 3-4; see *LBP-17-7*, 86 NRC at 95-97, 98, 100, 101.

⁸³ Appeal at 22.

⁸⁴ *Id.* (citing 2016 Brown Commentary).

be missed or underestimated by extensometers or an index that only considers crack width.”⁸⁵ And the Board found that Dr. Brown’s view that extensometers may fail to detect very localized and intensely damaging expansion adequately supported C-10’s concerns.⁸⁶ NextEra does not controvert the Board’s findings but rather argues that the use of *both* monitoring techniques addresses C-10’s concerns. But as the Board noted, these techniques are component parts of NextEra’s overall approach, and their merits are not at issue at this stage of the proceeding.⁸⁷ NextEra’s arguments on appeal are appropriately reserved for the merits proceeding. NextEra has not demonstrated Board error.

b. License Amendment Request Misconstrues the Effect of ASR

In the admitted portion of Contention B, C-10 asserts that “the [license amendment request] misconstrues expansion occurring within a reinforced concrete structure due to [ASR] because any mitigation of lost structural capacity, due to reinforcement, is temporary and unpredictable.”⁸⁸ Put another way, C-10 challenges NextEra’s claim that ASR-impacted concrete “held under ‘restraint’ by steel rebar increases in strength.”⁸⁹ C-10 argues that this assumption is incorrect because serious degradation could go undetected in concrete under restraint unless NextEra employs additional testing not contemplated by the license amendment request.⁹⁰ The relief that C-10 seeks here is further testing at different locations of the test program specimens and at Seabrook structures to provide an adequate comparison of the specimens and Seabrook concrete.⁹¹ According to Dr. Brown, without the testing, NextEra lacks a basis to predict whether abrupt changes in structural capacity will occur during the operating life of the facility.⁹²

NextEra argues that its plans to perform “comparative testing” address C-10’s concerns and that, accordingly, C-10 does not articulate a genuine dispute

⁸⁵ LBP-17-7, 86 NRC at 101-02 (citing 2013 Brown Commentary at 1-2, 5-6; 2016 Brown Commentary at 1-3).

⁸⁶ *Id.* at 101 (citing 2016 Brown Commentary at 1-3).

⁸⁷ *Id.* at 102; *see Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-11-11, 74 NRC 427, 442 n.81 (2011) (citing Changes to Adjudicatory Process; Final Rule, 69 Fed. Reg. 2182, 2190 (Jan. 14, 2004) (“The contention [admissibility] standard does not contemplate a determination of the merits of a proffered contention.”)).

⁸⁸ LBP-17-7, 86 NRC at 107.

⁸⁹ *Id.* at 103 (citing Petition at 5).

⁹⁰ *Id.*

⁹¹ 2016 Brown Commentary at 2; *see* LBP-17-7, 86 NRC at 104.

⁹² 2016 Brown Commentary at 2.

with the application.⁹³ NextEra also argues that C-10 does not explain why the proposed testing is insufficient.⁹⁴ Before the Board, however, NextEra relied on its proposed monitoring program to address this issue rather than pointing to the comparative testing that it now argues resolves C-10's concerns.⁹⁵ Concentrating its discussion on the specific argument NextEra raised, the Board considered and rejected NextEra's claim that "even if the mitigating effect of concrete reinforcement is unpredictable," the proposed monitoring program will ensure corrective action is taken prior to "any unacceptable impact on structural integrity."⁹⁶ There, the Board noted C-10's concerns regarding NextEra's proposed monitoring program, specifically with respect to the proposed intervals and the utility of extensometers in detecting ASR-induced localized and potentially damaging expansion in reinforced concrete.⁹⁷ On appeal, NextEra makes no mention of the Board's conclusion; it merely states that it will perform comparative testing. NextEra does not explain how that proposed testing relates to, much less addresses, the concerns the Board identified and therefore NextEra has not demonstrated Board error.⁹⁸

c. License Amendment Request Misconstrues ASR Due to Reliance on the Non-Representative Test Program

In Contention C, as admitted by the Board, C-10 challenges "NextEra's primary rationale for not undertaking petrographic analysis: that once ASR-affected cores are removed, the behavior of those cores no longer reflects that of the con-

⁹³ Appeal at 23-24 (citing MPR-4273 at vii, § 6.1.5). While, here, NextEra uses the term "comparative testing," it cites the MPR report excerpts that describe confirmatory testing. We understand NextEra to use "comparative" and "confirmatory" interchangeably.

⁹⁴ *Id.* at 24.

⁹⁵ NextEra Answer to Petition at 33; see LBP-17-7, 86 NRC at 106.

⁹⁶ LBP-17-7, 86 NRC at 106-07 (citing NextEra Answer to Petition at 33).

⁹⁷ *Id.*; see 2016 Brown Commentary at 2-3. In particular, Dr. Brown supports C-10's position with his view that "extensometers cannot determine the specific locations of expansion and consequently 'very localized and intensely damaging expansion could occur in planes parallel to the planes of the walls,'" which could go undetected. LBP-17-7, 86 NRC at 107 (quoting Petition at 4). As we previously noted, the sufficiency of NextEra's proposed monitoring program is a merits matter appropriately resolved later in the proceeding.

⁹⁸ NextEra further challenges the Board's narrowing of the contention to eliminate the theoretical issue of the pre-stressing effect, stating that the Board abused its discretion by "purg[ing] a petitioner's central claim from a contention in order to substitute a board's preferred challenge on the application." Appeal at 23. This argument also goes to the Board's reformulation authority. We expect the Board to narrow contentions to remove "unnecessary" issues from contentions. The Staff argued that C-10's argument related to the pre-stressing effect was not material to the findings the Staff must make, and the Board agreed. Staff Answer to Petition at 33; LBP-17-7, 86 NRC at 105-06. NextEra does not effectively challenge this determination.

fined structure.”⁹⁹ C-10 relied on Dr. Brown’s opinion that NextEra offered no evidence for its position that ASR-affected cores removed from their structure will not continue to represent the confined structure.¹⁰⁰ The Board found that this issue presented a genuine dispute concerning the application’s fundamental assumption that the progression of ASR at Seabrook is understood.¹⁰¹ And in Contention D, C-10 disputes the overall representative nature of the data from the large-scale test program.¹⁰² Considering the two contentions together, the Board found that C-10 articulated a genuine dispute by arguing with sufficient support that the test program fails to account for the condition of Seabrook concrete due to age, length of time ASR has propagated, exposure to fresh water at various levels, exposure to salt in the water at different levels and concentrations, the effects of heat, and the effects of radiation.¹⁰³ The Board concluded that Contention D was admissible as to the question of representativeness of the test program.¹⁰⁴

Before the Board, C-10 argued that the industry standard requires that petrographic analysis include core sampling and notes that “testing and analysis protocols for core sampling . . . are delineated by . . . American Concrete Institute’s ACI 349.3R [] and American Society for Testing and Material’s ASTM [C856-11].”¹⁰⁵ Among other objections, NextEra challenged admission of Contention C because C-10 has filed a petition for rulemaking requesting that all licensees comply with these codes and therefore should not be permitted to litigate the issue in this proceeding.¹⁰⁶ The Board rejected this argument, noting that “NextEra does not claim . . . that the NRC has initiated or is about to initiate a rulemaking in response to [C-10’s petition for rulemaking], so the rule prohibiting litigation of such matters does not apply.”¹⁰⁷ On appeal, NextEra renews its objection.¹⁰⁸

⁹⁹ LBP-17-7, 86 NRC at 108 (citing Petition at 6-7). At oral argument, C-10 defined petrographic analysis as “the evaluation of the core sampling for the interior of the concrete.” Tr. at 19-20.

¹⁰⁰ Petition at 6 (citing 2013 Brown Commentary at 2).

¹⁰¹ LBP-17-7, 86 NRC at 108; *see* Petition at 8.

¹⁰² Petition at 8-11; *see* LBP-17-7, 86 NRC at 112-21.

¹⁰³ LBP-17-7, 86 NRC at 113 (quoting Staff Answer to Petition at 28); *see* Petition at 11.

¹⁰⁴ LBP-17-7, 86 NRC at 114 (“[I]f the test program [is] not sufficiently representative of Seabrook concrete . . . the [license amendment request’s] reliance on the test program to support the monitoring program, acceptance criteria, and inspection intervals would be undermined.”).

¹⁰⁵ Petition at 7.

¹⁰⁶ NextEra Answer to Petition at 37 (citing Letter from Sandra Gavutis, C-10, to Annette Vietti-Cook, NRC (Sept. 25, 2014) (ML14281A124)).

¹⁰⁷ LBP-17-7, 86 NRC at 110 (citing *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 345 (1999)).

¹⁰⁸ Appeal at 25.

It is well established that “[a] licensing board[] should not accept in individual license proceedings contentions which are (or are about to become) the subject of general rulemaking by the Commission.”¹⁰⁹ In *Douglas Point*, the case that established this principle, the Atomic Safety and Licensing Appeal Board rejected a hearing request involving generic concerns about environmental effects of the uranium fuel cycle — the subject of a then-recently promulgated NRC regulation — in a construction permit proceeding.¹¹⁰ The Appeal Board specifically noted that the intervenor would have been eligible to intervene to argue that the environmental factors set forth in the new rule “tip the balance against issuing a permit to construct the Douglas Point nuclear facility.”¹¹¹ The Appeal Board rejected the petition because the intervenor “informed [the Appeal Board] that he . . . wish[ed] to go behind the environmental costs quantified by the Commission in the new rule to test their validity.”¹¹² This, the Appeal Board found, constituted “a challenge to the regulation itself.”¹¹³

Here, in contrast, C-10 challenges the adequacy of the specific proposed methodology set forth by the license amendment request for the Seabrook facility; C-10 has not raised a general challenge to our regulations or to any pending rulemaking proceeding.¹¹⁴ Further, despite the fact that C-10 has proposed a general methodology via rulemaking petition, we agree with the Board that its claim is not properly characterized as the subject of a rulemaking proceeding. The Staff has docketed the petition for rulemaking; the petition is pending before the agency, but no action has yet been taken on it.¹¹⁵

Recently, we affirmed a board’s rejection of a hearing request in which the requester sought a hearing on an individual licensing action on the ground that the Staff had constructively denied its pending rulemaking petition.¹¹⁶ The factual situation here is different. In that case, the proposed contentions fundamentally challenged the adequacy of an existing regulatory requirement. We therefore held that the challenge was not cognizable in that individual licensing

¹⁰⁹ *Potomac Electric Power Co.* (Douglas Point Nuclear Generating Station, Units 1 and 2), ALAB-218, 8 AEC 79, 85 (1974).

¹¹⁰ *Id.* at 79.

¹¹¹ *Id.* at 88.

¹¹² *Id.*

¹¹³ *Id.* at 89.

¹¹⁴ Petition at 6-8.

¹¹⁵ Improved Identification Techniques Against Alkali-Silica Reaction Concrete Degradation at Nuclear Power Plants; Petition for Rulemaking; Notice of Docketing and Request for Comment, 80 Fed. Reg. 1476 (Jan. 12, 2015); see <https://www.nrc.gov/reading-rm/doc-collections/rulemaking-ruleforum/active/PetitionDetails.html?id=9>; LBP-17-7, 86 NRC at 110 (noting that NextEra does not argue that the Staff has initiated or plans to initiate a rulemaking proceeding on this subject); Tr. at 106; NextEra Answer to Petition at 37.

¹¹⁶ *Browns Ferry*, CLI-17-5, 85 NRC at 92, 94.

proceeding.¹¹⁷ Here, in contrast, C-10's challenge to testing and analysis protocols for core sampling represents a particularized challenge to NextEra's license amendment request.¹¹⁸ Although C-10 has filed a petition for rulemaking on a generic matter, in this case C-10 has sufficiently demonstrated a dispute with the individual licensing action at issue here.¹¹⁹

NextEra also reiterates its argument that "merely demanding the adoption of a preferred approach" (petrographic analysis) "is not enough to show a deficiency in, or a genuine dispute with, the *application*."¹²⁰ But NextEra misinterprets the Board's analysis of this issue. The Board, informed by the connections between C-10's arguments on Contentions C and D, found that C-10 raised adequately supported concerns as to whether the test program specimens are representative of Seabrook concrete, calling into question the validity of NextEra's calculations.¹²¹ NextEra does not challenge this "representativeness" determination with specificity.

NextEra further argues that the Staff, rather than C-10, articulated the connections between C-10's arguments regarding the representative nature of the test program and the license amendment request's programmatic features, and that the Board thereafter improperly inserted those connections into the contention to render it admissible.¹²² This argument is without merit. As we previously explained, C-10 itself advanced each of the interrelated arguments contained in the reformulated contention. NextEra's disagreement with the Staff's litigation approach does not demonstrate that the Board created connections not contemplated by C-10.

Specifically, C-10 relied on a report prepared for the NRC regarding the effects of radiation on concrete used in nuclear power plants.¹²³ C-10 argued that this report, NUREG/CR-7171, supports its argument that radiation and heat may accelerate ASR progression.¹²⁴ The Board found that the report supported C-10's argument because the NUREG focused on the potential coupling effect between radiation and ASR that can potentially accelerate or cause ASR to occur, partic-

¹¹⁷ *Id.*

¹¹⁸ See *Gulf States Utilities Co.* (River Bend Station, Units 1 and 2), ALAB-444, 6 NRC 760, 773 (1977).

¹¹⁹ In *Browns Ferry*, the petitioner did not dispute that the application complied with existing regulatory requirements. *Browns Ferry*, CLI-17-5, 85 NRC at 92.

¹²⁰ Appeal at 25-26.

¹²¹ LBP-17-7, 86 NRC at 109, 111.

¹²² Appeal at 16.

¹²³ Petition at 10 (quoting "A Review of the Effects of Radiation on Microstructure and Properties of Concretes Used in Nuclear Power Plants," NUREG/CR-7171 (Nov. 2013), § 8.2.2 (ML13325-B077) (NUREG/CR-7171)).

¹²⁴ *Id.*

ularly as plants age.¹²⁵ The Board reviewed the NUREG and found that “it ha[d] no difficulty discerning the connection between [certain identified] provisions of NUREG/CR-7171 and C-10’s claim that the test program specimens were not representative of Seabrook concrete.”¹²⁶ On appeal, NextEra argues that the Board erred because C-10 did not itself explain the materiality of the information in NUREG/CR-7171 and the Board instead articulated the connection for C-10.¹²⁷ But we find no error with the Board’s conclusion regarding the connection between NUREG/CR-7171 and C-10’s “representativeness” claim.

The Board explained that C-10 identified, among other factors, heat and radiation as variables that may contribute to the “non-linear advancement of ASR over the course of 35-40 years’ in the concrete structures at Seabrook.”¹²⁸ In its petition, C-10 introduced NUREG/CR-7171 by stating that “[t]he effect of radiation in particular, on the progressive weakening of concrete through ASR, is notable. Indeed [NUREG/CR-7171] highlights the changes that radiation (and heat) can bring about.”¹²⁹ NextEra criticizes the Board for having cited to (and thereby relied upon) sections of NUREG/CR-7171 that C-10 did not specifically cite.¹³⁰ But we expect the Board to review the material offered by a petitioner as a support for a contention.¹³¹ In so doing, the Board did not substitute its judgment for that of C-10; rather, it looked to arguments C-10 advanced and portions of NUREG/CR-7171 that C-10 relied upon.¹³² NextEra has not demonstrated that the Board erred in concluding that C-10 sufficiently explained the materiality of NUREG/CR-7171.

NextEra further asserts that the Board erred in finding that NUREG/CR-7171 supported Contention D because the report does not identify a deficiency in the license amendment request.¹³³ NextEra argues that the Board misread the NUREG, which, according to NextEra “references an *open question* as to whether ASR, once established, behaves differently in irradiated concrete than

¹²⁵ LBP-17-7, 86 NRC at 116.

¹²⁶ *Id.*

¹²⁷ Appeal at 17.

¹²⁸ LBP-17-7, 86 NRC at 116 (quoting Petition at 10).

¹²⁹ Petition at 10.

¹³⁰ Appeal at 17.

¹³¹ See *Yankee Atomic Electric Co.* (Yankee Nuclear Power Station), LBP-96-2, 43 NRC 61, 90 (1996) (“A document put forth by an intervenor as the basis for a contention is subject to scrutiny both for what it does and does not show.”), *rev’d in part on other grounds*, CLI-96-7, 43 NRC 235 (1996).

¹³² LBP-17-7, 86 NRC at 116 (“NUREG/CR-7171 supports C-10’s argument by noting the ‘coupling effect between radiation and ASR that can potentially accelerate ASR activity.’” (quoting NUREG/CR-7171 § 8.2.2, quoted, in turn, in the Petition at 10)).

¹³³ Appeal at 18.

unirradiated concrete.”¹³⁴ NextEra characterizes the NUREG’s concerns as “sheer speculation” and an area for “potential . . . future research” and asserts that neither is sufficient to create a material dispute.¹³⁵ Here, NextEra disputes the merits of C-10’s arguments, namely, whether radiation exposure affects the rate of ASR propagation. Such a disagreement does not demonstrate Board error on the contention admissibility determination.¹³⁶

d. Frequency of Proposed Inspection Intervals

In Contention H, as admitted, C-10 challenges the frequency of NextEra’s proposed inspection intervals.¹³⁷ C-10 argues “that the monitoring intervals that NextEra proposes . . . are too long . . . to effectively measure the ongoing effects of ASR to structures.”¹³⁸ The license amendment request sets forth the structural monitoring program’s ASR in-plane expansion acceptance criteria and monitoring frequencies.¹³⁹ C-10 challenged the frequency of the inspections, relying on Dr. Brown’s opinion that the monitoring intervals are insufficient because the rate of progression of ASR-related degradation has not been adequately evaluated.¹⁴⁰ Dr. Brown disputes NextEra’s ability to predict sudden change caused by advancing ASR absent direct physical testing of Seabrook concrete.¹⁴¹ The Board found that this argument also relates to the representativeness of the

¹³⁴ *Id.*

¹³⁵ *Id.* NextEra also disputes as irrelevant a portion of NUREG/CR-7171 quoted by C-10 that references studies stating radiation can cause ASR in non-reactive aggregates because Seabrook’s aggregates are already reactive. *Id.* (citing NextEra Answer to Petition at 34-35); see NUREG/CR-7171 § 6.1. NextEra does not demonstrate Board error here; in finding that NUREG/CR-7171 supported C-10’s argument, the Board referred also to the potential acceleration of ASR due to radiation. LBP-17-7, 86 NRC at 116.

¹³⁶ NextEra argues that representativeness is not a valid concern since “the degree of similarity of behavior . . . [will be] empirically verified through the life of the plant” by virtue of planned confirmatory testing. Appeal at 19. However, NextEra’s assertion that it will perform confirmatory testing does not moot C-10’s argument that NextEra’s proposed methodology is flawed because it was derived from the (arguably unrepresentative) test program.

NextEra further contends that because Contentions A, B, C, and H depend on elements of Contention D, the asserted error in admitting the issue raised by Contention D necessarily means that the other elements of the contention are inadmissible. *Id.* Because we reject NextEra’s challenges to Contention D, this argument is unavailing.

¹³⁷ Petition at 15-16.

¹³⁸ LBP-17-7, 86 NRC at 122. The Board excluded C-10’s claim that the monitoring intervals are “too fixed” on the ground that this claim constituted an impermissible challenge to the maintenance rule, 10 C.F.R. § 50.65(a). *Id.* at 125.

¹³⁹ LAR Evaluation § 3.5.1 tbl.5.

¹⁴⁰ Petition at 15 (citing 2016 Brown Commentary at 1); see LBP-17-7, 86 NRC at 122.

¹⁴¹ LBP-17-7, 86 NRC at 124 (citing 2016 Brown Commentary at 3).

large-scale test program: “if the test program is not sufficiently representative of Seabrook concrete, the [license amendment request’s] reliance on the test program to support the inspection intervals would be undermined.”¹⁴²

Before the Board, NextEra disputed C-10’s assertion that the rate of ASR progression at Seabrook is unknown and argued that ASR at Seabrook is progressing slowly.¹⁴³ It argued that “[C-10’s] claim that ‘there is no real knowledge of the speed of disintegration’ of Seabrook’s concrete is not accurate. As the MPR Reports indicate, Seabrook’s ASR has a ‘slow rate of change.’”¹⁴⁴ On appeal, NextEra objects to the Board’s statement that NextEra relied on a “*continuously slow*” rate of progression of ASR expansion at Seabrook to support its expectation that ASR will continue to progress slowly “through the termination of the current Seabrook license in 2030.”¹⁴⁵ NextEra argues that the Board misunderstood NextEra’s factual observation that historical data indicate the presence of ASR with a “slow rate of change” — that is, “slow” does not equal “continuously slow.”¹⁴⁶ Accordingly, NextEra argues, the Board “mischaracterize[d] NextEra’s arguments and the [license amendment request] itself” and therefore erred both in finding that C-10 provided adequate support for its argument and in concluding that it had articulated a genuine dispute regarding the frequency of inspection intervals.¹⁴⁷ As discussed below, NextEra does not demonstrate reversible Board error with respect to this issue.

C-10 challenged the frequency of the inspection intervals on the basis of Dr. Brown’s opinion questioning the predictability of ASR progression at Seabrook.¹⁴⁸ The Board found that C-10, based on Dr. Brown’s opinion, articulated a dispute with the inspection intervals set forth in the request; it noted Dr. Brown’s statement that “a slow rate of ASR progression may eventually give way to more rapid deterioration that the test program failed to address.”¹⁴⁹ C-10’s challenge to the length of inspection intervals relates to whether the rate of ASR-related expansion is understood, not whether the Board has incorrectly

¹⁴² *Id.* at 123; *see also* Staff Answer to Petition at 38 (highlighting a connection between C-10’s challenge to the inspection intervals and its argument that the test program results are not representative).

¹⁴³ NextEra Answer to Petition at 64.

¹⁴⁴ *Id.* (quoting MPR-4288 § 1.2.2 (describing the rate of change of ASR at Seabrook as slow)); *see id.* (citing LAR Supplement, Encl. 3, MPR-4153, “Seabrook Station — Approach for Determining Through-Thickness Expansion from Alkali-Silica Reaction,” rev. 2 (July 2016), § 1.2.2 (ML16279A050) (non-proprietary version) (same)).

¹⁴⁵ Appeal at 26 (quoting LBP-17-7, 86 NRC at 124).

¹⁴⁶ *Id.*

¹⁴⁷ *Id.* at 26-27.

¹⁴⁸ Petition at 15-16; *see* 2016 Brown Commentary at 3.

¹⁴⁹ LBP-17-7, 86 NRC at 124-25 (citing 2016 Brown Commentary at 2-3).

assumed a specific rate of progression.¹⁵⁰ Even taking as true that the license amendment request does not assume a “continuously slow” rate of change of ASR, the Board’s assumption that it does would amount to at most harmless error. C-10 has in any case articulated a genuine dispute as to whether the proposed inspection intervals may be too infrequent to detect rapid, unpredictable deterioration not addressed by the test program.¹⁵¹ We therefore conclude that the Board did not abuse its discretion.¹⁵²

III. CONCLUSION

For the foregoing reasons, we *affirm* the Board’s decision in LBP-17-7. NextEra has not demonstrated an error of law or abuse of discretion with respect to the Board’s decision to admit a single, reformulated contention in this matter.

IT IS SO ORDERED.

For the Commission

Annette L. Vietti-Cook
Secretary of the Commission

Dated at Rockville, Maryland,
this 12th day of April 2018.

¹⁵⁰ Petition at 15.

¹⁵¹ See LBP-17-7, 86 NRC at 124-25.

¹⁵² NextEra appears to question the Board’s admission of C-10’s challenge to the inspection intervals given that the Board recognized that the NRC’s maintenance rule requires “NextEra [to] ‘change the monitoring intervals’ as necessary.” Appeal at 26 (quoting LBP-17-7, 86 NRC at 125). The maintenance rule requires licensees to “monitor the performance or condition of structures, systems, or components, against licensee-established goals, in a manner sufficient to provide reasonable assurance that these structures, systems, and components . . . are capable of fulfilling their intended functions.” 10 C.F.R. § 50.65(a)(1). We understand C-10 to argue that the proposed *starting point* for inspection intervals (developed, C-10 argues, based on non-representative data) poses an unacceptable level of risk, despite the maintenance rule’s requirement the intervals be adjusted if necessary. See Petition at 15; C-10 Answer at 9-10. C-10 argues that “[a] lot can happen in” the proposed interval between the inspections; according to this argument, the time between inspections may allow for rapid, unpredictable degradation, and the maintenance rule’s required adjustment may come too late. Petition at 15; see *id.* at 16. The question whether the inspection intervals are sufficiently protective of public health and safety — and whether the maintenance rule affects this inquiry — is a matter appropriately reserved for the merits proceeding.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION

Brian E. Holian, Acting Director

In the Matter of

Docket Nos. STN 50-456
STN 50-457
(License Nos. NPF-72,
NPF-77)
Docket Nos. STN 50-454
STN 50-455
(License Nos. NPF-37,
NPF-66)

EXELON GENERATION
COMPANY, LLC
(Braidwood Nuclear Power Station,
Units 1 and 2; Byron Nuclear
Power Station, Units 1 and 2)

April 24, 2018

By petition dated February 8, 2017, Mr. Barry Quigley (Petitioner) filed a petition under Title 10, "Energy," of the *Code of Federal Regulations* (10 C.F.R.) § 2.206, "Requests for Action Under This Subpart." The Petitioner requested the U.S. Nuclear Regulatory Commission (NRC) to take action against Exelon Generation Company, LLC (Exelon) regarding the Byron and Braidwood Stations to: (1) issue a violation for deficiencies in the analysis of record (AOR) for the main steam isolation valve (MSIV) room pressurization following a high-energy line break, (2) issue a violation for failure to update the AOR in a timely manner, (3) require Exelon to show that the consequences of the secondary missiles resulting from the MSIV room pressurization do not have adverse consequences, (4) issue a demand for information to compare and contrast the behavior of Exelon management as described in the petition with the NRC's policy statement on the attributes of a safety-conscious work environment (SCWE), and (5) use

Exelon's response to request 4, above, as a basis on which to determine whether to issue a "chilling effects" letter.

As the basis of the requests, the Petitioner stated: (1) the break enthalpies used in the AOR are actually the thermodynamic internal energy of the steam, not the enthalpy, and steam flow from secondary piping is neglected; (2) corrective actions to resolve an issue in the AOR are long overdue (8 years) and improperly tracked; (3) a proposed revision to the AOR shows that the MSIV room roof slabs will be ejected by the high pressures in the MSIV rooms, becoming potential missiles; and (4) management dismissed information that supported concerns about the AOR as "excessive detail" and directed personnel to remove the information.

In this Director's Decision, dated April 24, 2018, the Director of the Office of Nuclear Reactor Regulation granted the petition in part. NRC inspectors conducted inspections at the Byron and Braidwood Stations and identified violations consistent with the Petitioner's requests 1 and 2. Request 3 did not meet the criteria for review under 10 C.F.R. § 2.206 because it did not request enforcement action. However, the Licensee and the NRC have taken action that addresses the issue raised by the Petitioner. The Licensee initiated operability evaluations that determined that no equipment safety functions are affected by potential missiles. NRC inspectors did not identify concerns with the operability evaluations, but did identify violations related to design deficiencies involving secondary missiles and the failure to correct the design deficiencies. The Licensee provided a voluntary response to the petition that provided an assessment of the SCWE at Byron and Braidwood Stations. In view of the voluntary response the NRC determined no demand for information was necessary. NRC inspectors assessed the Licensee's SCWE at Byron Station. The inspection did not identify any chilling effect or impediment to the establishment of an SCWE at Byron Station. Based on the Licensee's voluntary response and the NRC inspection of the SCWE, the NRC determined that a "chilling effects" letter was not warranted.

DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206

I. INTRODUCTION

By e-mail to Mr. Victor M. McCree, Executive Director for Operations, dated February 8, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17061A127), Mr. Barry Quigley filed a petition under Title 10, "Energy," of the *Code of Federal Regulations* (10 C.F.R.) § 2.206, "Requests for Action Under This Subpart." Attachments to the peti-

tion are located at ADAMS Accession Nos. ML17061A126, ML17061A125, and ML17061A124. The Petitioner requested that the U.S. Nuclear Regulatory Commission (NRC or the Commission) take the following actions against Exelon Generation Company, LLC (Exelon), the Licensee for Byron Station, Unit Nos. 1 and 2, and Braidwood Station, Units 1 and 2:

1. Issue a violation under 10 C.F.R. Part 50, “Domestic Licensing of Production and Utilization Facilities,” Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,” Criterion III, “Design Control,” for deficiencies in the analysis of record (AOR) for the main steam isolation valve (MSIV) room pressurization following a high-energy line break (HELB).
2. Issue a violation under 10 C.F.R. Part 50, Appendix B, Criterion XVI, “Corrective Action,” for failure to update the AOR in a timely manner.
3. Require Exelon to show that the consequences of the secondary missiles resulting from MSIV room pressurization do not have adverse consequences.
4. Issue a Demand for Information under 10 C.F.R. § 2.204, “Demand for Information,” to compare and contrast the behavior of Exelon management as described in the petition with the NRC’s policy statement on the attributes of a safety-conscious work environment (SCWE).
5. Use Exelon’s response to Item 4 above as a basis on which to determine whether to issue a “chilling effects” letter.

As the basis for the request, the Petitioner stated the following:

1. (a) Break enthalpies used in the MSIV room pressurization AOR are actually the thermodynamic internal energy of the steam, not the enthalpy. Because, in the range of interest, the internal energy is about 13% less than the enthalpy, the energy flow to the areas of concern is nonconservative.
(b) Steam flow from secondary piping is neglected.
2. Corrective actions to resolve an issue in the AOR are long overdue (8 years) and improperly tracked.
3. A proposed revision to the AOR shows that the MSIV room roof slabs will be ejected by the high pressures in the MSIV rooms becoming potential missiles.
4. Management dismissed information in the updated final safety evaluation report (UFSAR) that supported the concerns about the AOR as “ex-

cessive detail” and directed personnel to remove the information. Management dismissed UFSAR internal inconsistency related to the “Break Exclusion Zone” without discussion or review and stated that the information supporting the concern could be deleted as an UFSAR cleanup item. Recently, there was an operability concern for which engineering management maintained a position of operability in the face of conflicting information. The information that engineering management relied on to support operability was demonstrably irrelevant.

The Petitioner met with the Office of Nuclear Reactor Regulation (NRR) Petition Review Board (PRB) on April 13, 2017, to clarify the basis for the petition. The NRC is treating the transcript of this meeting (ADAMS Accession No. ML17111A774) as a supplement to the petition. In its acknowledgment letter dated July 17, 2017 (ADAMS Accession No. ML17125A245), the NRC informed the Petitioner that Items 1, 2, 4, and 5 were accepted for review under 10 C.F.R. § 2.206 and that the agency had referred the issues in the petition to NRR for appropriate action. This letter states that Item 3 does not request enforcement action and, therefore, does not meet the criteria for acceptance for review under 10 C.F.R. § 2.206. However, the NRC informed the Petitioner that the item is likely to be resolved when reviewing activities to address the AOR under Item 1.

By letter dated July 26, 2017 (ADAMS Accession No. ML17166A362), the NRC requested that Exelon provide a voluntary response to the petition. By letter dated September 1, 2017 (ADAMS Accession No. ML17255A824), Exelon provided its voluntary response.

II. DISCUSSION

1. Issue a violation under 10 C.F.R. Part 50, Appendix B, Criterion III, for deficiencies in the AOR for the MSIV room pressurization following an HELB.

The Petitioner’s basis and the Licensee’s September 1, 2017, voluntary response letter both identify errors in calculation 3C8-0282-001, Revision 3. The Licensee stated in its voluntary response letter that calculation 3C8-0282-001 is the design-basis analysis for the structural design of the MSIV house and the main steam tunnel. The regulation under 10 C.F.R. Part 50, Appendix B, Criterion III, “Design Control,” requires, in part, that the Licensee provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternative or simplified calculational methods, or by the performance of a suitable testing program. The NRC Region III staff conducted inspections at the Byron and Braidwood Stations between October 30

and November 16, 2017. The inspectors identified that as of October 22, 1996, and continuing through the date of the NRC inspections, the Licensee failed to verify that Design Analysis 3C8-0282-001, Revision 3, which was the AOR addressing a postulated HELB in the safety-related main steam safety valve (MSSV) rooms [the Petitioner and the Licensee used the label MSIV house or room], would not cause a structural failure since it failed to apply worst-case environmental loading. The NRC Inspection Reports 05000454/455-2017-010 for Byron Station and 05000456/457-2017-008 for Braidwood Station, dated December 15, 2017 (ADAMS Accession Nos. ML17349A917 and ML17349A894, respectively), each identify a non-cited violation (NCV) of 10 C.F.R. Part 50, Appendix B, Criterion III, "Design Control."

2. Issue a violation under 10 C.F.R. Part 50, Appendix B, Criterion XVI, for failure to update the AOR in a timely manner.

The Petitioner's basis states that although the errors regarding the wrong break enthalpies in calculation 3C8-0282-001, Revision 3, were documented on June 30, 2008, in Issue Report 792213, "MSLB Calc[ulation] Energy Release Error," the analysis still contains the nonconservative break enthalpies 8 years later. Exelon's voluntary response letter agrees that Issue Report 792213 for Byron Station and the related Issue Report 792215 for Braidwood Station were documented on June 30, 2008. Exelon's voluntary response letter shows that it issued a contract with a vendor to revise calculation 3C8-0282-001, Revision 3, in February 2013; 5 years after identification of the error. In November 2013, the vendor provided a draft copy of a revision to calculation 3C8-0282-001 to Exelon for review. Currently, Exelon still has the analysis and proposed plant modifications under review to correct the analysis.

The regulation under 10 C.F.R. Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as nonconformances, are promptly identified and corrected. The NRC Region III staff conducted inspections at the Byron and Braidwood Stations between October 30 and November 16, 2017. The inspectors identified that as of the dates of NRC inspections at Byron and Braidwood Stations, the Licensee failed to promptly correct errors in Design Analysis 3C8-0282-001, Revision 3, for a main steam line break in the safety-related MSSV rooms [the Petitioner and the Licensee used the label MSIV house or room] and steam tunnels that were identified on June 30, 2008. The NRC Inspection Reports 05000454/455-2017-010 for Byron Station and 05000456/457-2017-008

for Braidwood Station, dated December 15, 2017, each identify an NCV of 10 C.F.R. Part 50, Appendix B, Criterion XVI, “Corrective Action.”

3. Require Exelon to show that the consequences of the secondary missiles resulting from MSIV room pressurization do not have adverse consequences.

The July 17, 2017, acknowledgment letter informed the Petitioner that this item did not meet the criteria for review under 10 C.F.R. § 2.206 because it does not request enforcement action, as specified in Management Directive 8.11, “Review Process for 10 CFR 2.206 Petitions” (MD 8.11). However, the Licensee and NRC have taken action that addresses the issue raised by the Petitioner. In September 2017, the Licensee initiated operability evaluations (Operability Evaluation 17-002, Revision 0, for Braidwood Station and Operability Evaluation 17-001, Revision 0, for Byron Station) to address the consequences of secondary missiles from the MSIV room pressurization and has determined that no equipment safety functions are affected by potential missiles. During inspections conducted at Byron Station (Inspection Reports 05000454/455-2017-003 (ADAMS Accession No. ML17306A639) and 05000454/455-2017-010) and Braidwood Station (Inspection Reports 05000456/457-2017-003 (ADAMS Accession No. ML17306A664) and 05000456/457-2017-008), the NRC reviewed the Licensee’s revisions to the applicable operability evaluations and did not identify any concerns, but did identify NCVs of 10 C.F.R. Part 50, Appendix B, Criterion III, “Design Control,” for the failure to identify design deficiencies involving secondary missiles from the MSSV room pressurization and NCVs of 10 C.F.R. Part 50, Appendix B, Criterion XVI, “Corrective Action,” for the failure to correct the design deficiencies.

4. Issue a “Demand for Information” under 10 C.F.R. § 2.204, to compare and contrast the behavior of Exelon management as described in the petition with the NRC’s policy statement on the attributes of an SCWE.

As described in the NRC Enforcement Manual (ADAMS Accession No. ML102630150), a demand for information (DFI) is a formal request made to a Licensee or applicant to obtain information for the NRC Staff to determine whether an Order should be issued to modify, suspend, or revoke the license, or whether to take other enforcement action. The PRB determined that issuance of a DFI in this circumstance was not necessary to evaluate the SCWE concerns expressed in the petition. Consistent with MD 8.11, the NRC’s letter dated July 26, 2017, requested that Exelon provide a voluntary response to the concerns raised in the petition. Exelon’s September 1, 2017, response, in part, provided the results of its evaluation of the SCWE at Byron Station. Exelon’s evaluation

included interviews with Braidwood Station personnel that were involved with the activities that the Petitioner described in the petition. The evaluation concluded that the actions taken and behaviors demonstrated by Exelon management in response to the issues and activities cited in the petition dated February 8, 2017, demonstrate a healthy SCWE.

The NRC conducted an inspection at Byron Station that ended on August 25, 2017 (Inspection Report 05000454/455-2017-007 (ADAMS Accession No. ML17276B174)) that, in part, assessed the Licensee's SCWE at Byron Station. Information obtained from interviews and focus groups (including with engineering personnel) indicated that an environment was established where Licensee personnel felt free to raise nuclear safety issues without fear of retaliation. Licensee personnel were generally aware of and familiar with the corrective action program (CAP) and other processes, including the Employee Concerns Program (ECP) and the NRC's allegation process, through which concerns could be raised. In addition, a review of the types of issues in the ECP indicated that the Licensee's staff members were appropriately using the CAP and ECP to identify issues. The inspection did not identify any examples where there was retaliation for raising nuclear safety issues. Documents regarding surveys and monitoring of the safety culture and SCWE generally supported the conclusions from the interviews. The inspection did not identify any chilling effect or impediment to the establishment of an SCWE at Byron Station.

5. Use Exelon's response to Item 4, above, as a basis on which to determine whether to issue a "chilling effects" letter.

A chilling effect letter is a regulatory tool identified in the NRC Allegations Manual (ADAMS Accession No. ML17003A227) that the NRC uses to ensure that licensees are taking appropriate actions to foster a workplace environment that encourages employees to raise safety concerns and to feel free to do so without fear of retaliation, referred to as an SCWE. A chilling effect letter may be appropriate when there are indications of a chilled work environment, but no discrimination concern has been substantiated. Neither Exelon's voluntary response nor NRC's inspection at Byron Station, as discussed in Item 4, identified evidence of a chilled environment at the Byron Station.

III. CONCLUSION

The NRC staff conducted inspections at the Byron Station and Braidwood Station that assessed the Licensee's compliance with the regulations under 10 C.F.R. Part 50, Appendix B, Criterion III, "Design Control," and Criterion XVI, "Corrective Action," related to the adequacy of the AOR for the structural design

of the MSIV house and the main steam tunnel, and took enforcement action as outlined in the inspection reports identified above. The NRC Staff requested that the Licensee evaluate the SCWE concerns expressed in the petition, and conducted an inspection that assessed the Licensee's SCWE at Byron Station. Based on the Licensee's voluntary response and the results of the inspection, the NRC Staff did not identify challenges to the Licensee's SCWE or evidence of a chilled environment at the Byron Station and, therefore, determined that issuance of a chilling effect letter was not warranted. Because these actions address the underlying concerns raised in requests 1, 2, 4, and 5 of the petition, the petition is granted in part.

As provided in 10 C.F.R. § 2.206(c), a copy of this Director's Decision will be filed with the Secretary of the Commission for review. As provided by this regulation, the Decision will constitute the final action of the Commission 25 days after the date of the Decision unless the Commission, on its own motion, institutes a review of the Decision within that time.

For the Nuclear Regulatory
Commission

Brian E. Holian, Acting Director
Office of Nuclear Reactor
Regulation

Dated at Rockville, Maryland,
this 24th day of April 2018.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Kristine L. Svinicki, Chairman
Jeff Baran
Stephen G. Burns

In the Matter of

Docket No. 52-047-ESP

TENNESSEE VALLEY AUTHORITY
(Clinch River Nuclear Site
Early Site Permit Application)

May 3, 2018

RULES OF PRACTICE, APPEALS

The Commission's rules of practice provide an appeal as of right to a party other than the petitioner on the question whether a petition to intervene should have been wholly denied.

RULES OF PRACTICE, STANDARD OF REVIEW

The Commission generally defers to licensing board rulings on contention admissibility absent error of law or abuse of discretion.

RULES OF PRACTICE, CONTENTIONS

The Commission has long recognized a difference between "contentions of omission," those that claim an omission of necessary information, and "contentions of adequacy," those "that challenge substantively and specifically how particular information has been discussed in a license application."

RULES OF PRACTICE, CONTENTIONS

Contentions of omission generally need not provide the same level of factual

support required for a contention challenging the adequacy of information in an application. It is enough for a petitioner to identify the information that is claimed to be missing and demonstrate why that information is required.

RULES OF PRACTICE, CONTENTIONS, NATIONAL ENVIRONMENTAL POLICY ACT

Contentions must be raised at the earliest possible opportunity. Contentions arising under the National Environmental Policy Act (NEPA) must be based on an applicant's Environmental Report. Failure to do so could result in dismissal of the contention as impermissibly late.

MEMORANDUM AND ORDER

The Tennessee Valley Authority (TVA) has appealed the Atomic Safety and Licensing Board's decision in LBP-17-8, in which the Board granted a joint intervention petition and admitted two contentions filed by the Southern Alliance for Clean Energy (SACE) and the Tennessee Environmental Council (TEC).¹ For the reasons set forth below, we affirm in part, and reverse in part, the Board's decision.

I. BACKGROUND

In May 2016, Tennessee Valley Authority filed an application for an early site permit for two or more small modular reactors at the Clinch River Nuclear Site in Oak Ridge, Tennessee.² Thereafter, SACE and TEC filed a petition to intervene and proffered three contentions challenging the application.³ TVA and

¹ Tennessee Valley Authority's Notice of Appeal of LBP-17-08 (Nov. 6, 2017); Tennessee Valley Authority's Petition for Review of LBP-17-08 (Nov. 6, 2017) (Appeal); LBP-17-8, 86 NRC 138 (2017).

² Tennessee Valley Authority; Clinch River Nuclear Site, 81 Fed. Reg. 40,929, 40,929 (June 23, 2016); Letter from J.W. Shea, TVA, to NRC Document Control Desk (May 12, 2016), at 1 (ADAMS accession no. ML16139A752).

³ Petition to Intervene and Request for Hearing (June 12, 2017) (SACE and TEC Petition); *see* Tennessee Valley Authority; Clinch River Nuclear Site Early Site Permit Application and Associated Order Imposing Procedures for Access to Sensitive Unclassified Non-Safeguards Information and Safeguards Information, 82 Fed. Reg. 16,436 (Apr. 4, 2017) (Notice of Hearing); Order of the Secretary (Granting Request for Extension) (June 2, 2017) (unpublished) (extending the deadline

(Continued)

the NRC Staff opposed the petition on the ground that all of SACE and TEC's contentions were inadmissible.⁴

The Board found that SACE and TEC had demonstrated standing to intervene and admitted two of their contentions: Contention 2, an environmental contention regarding consideration of the consequences of a spent fuel pool fire; and Contention 3, an environmental contention in which SACE and TEC claimed that TVA's Environmental Report contained an impermissible discussion of energy alternatives and need for power.⁵ TVA has now filed the instant appeal, which SACE and TEC oppose.⁶ The NRC Staff has neither filed an answer in response to TVA's appeal nor filed an appeal of its own.

II. DISCUSSION

Our rules of practice provide an appeal as of right to a party other than the petitioner on the question whether a petition to intervene should have been wholly denied.⁷ We generally defer to licensing board rulings on contention admissibility absent error of law or abuse of discretion.⁸

to file intervention petitions). The Blue Ridge Environmental Defense League (BREDL) filed a separate intervention petition with one contention; the Board denied the petition, and BREDL did not appeal the Board's ruling. *See* LBP-17-8, 86 NRC at 152, 166; Hearing Request and Petition to Intervene by Blue Ridge Environmental Defense League (June 12, 2017), at 6-13.

⁴ Tennessee Valley Authority's Answer Opposing Petitions for Intervention and Requests for Hearing by the Southern Alliance for Clean Energy and Tennessee Environmental Council, and the Blue Ridge Environmental Defense League (July 7, 2017), at 1 (TVA Answer); NRC Staff Answer to Southern Alliance for Clean Energy and Tennessee Environmental Council's Petition to Intervene and Request for Hearing (July 7, 2017), at 1 (Staff Answer). Neither TVA nor the Staff opposed SACE's or TEC's standing to intervene. TVA Answer at 2-3; Staff Answer at 8-10.

⁵ LBP-17-8, 86 NRC at 160, 164-66. The Board dismissed Contention 1, which concerned emergency preparedness. The Board determined that SACE and TEC had misapprehended the nature of TVA's request for an exemption to use an alternative methodology to determine the appropriate size of the emergency planning zone and thus had not established a genuine dispute with the applicant or raised an issue within the scope of the proceeding. *Id.* at 155-56. SACE and TEC sought reconsideration of the Board's ruling on Contention 1; the Board declined to reconsider its ruling. Licensing Board Order (Granting Intervenors' Motion for Leave to File Motion for Partial Reconsideration, and Denying Motion for Partial Reconsideration) (Nov. 9, 2017) (unpublished). Contention 1 is not before us on appeal.

⁶ Intervenors' Response to Tennessee Valley Authority's Appeal of LBP-17-08 (Nov. 30, 2017), at 1 (SACE and TEC Response).

⁷ 10 C.F.R. § 2.311(d)(1).

⁸ *See, e.g., Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-16-9, 83 NRC 472, 482 (2016); *Crow Butte Resources, Inc.* (Marsland Expansion Area), CLI-14-2, 79 NRC 11, 13-14 (2014).

A petition to intervene will be granted if the petitioner demonstrates standing and raises at least one admissible contention that meets the six-factor test in 10 C.F.R. § 2.309(f)(1).⁹ To satisfy that test, a petitioner must

- (i) provide a specific statement of the issue of law or fact to be raised or controverted;
- (ii) provide a brief explanation of the basis for the contention;
- (iii) demonstrate that the issue raised is within the scope of the proceeding;
- (iv) demonstrate that the issue raised is material to the findings the NRC must make to support the action involved in the proceeding;
- (v) provide a concise statement of the alleged facts or expert opinions that support the petitioner's position on the issue and on which the petitioner intends to rely at the hearing, together with references to the specific sources and documents on which the petitioner intends to rely to support its position on the issue; and
- (vi) provide sufficient information to show that a genuine dispute exists with the applicant on a material issue of law or fact.¹⁰

We have long recognized a difference between “contentions of omission,” those that claim an omission of necessary information, and “contentions of adequacy,” those “that challenge substantively and specifically how particular information has been discussed in a license application.”¹¹ Contentions of omission generally need not provide the same level of factual support required for a contention challenging the adequacy of information in an application. It is enough for a petitioner to identify the information that is claimed to be missing and demonstrate why that information is required.¹²

But regardless of how they are characterized, contentions must be raised at

⁹ 10 C.F.R. § 2.309(a).

¹⁰ *Id.* § 2.309(f)(1).

¹¹ *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-28, 56 NRC 373, 382-83 (2002); *see also Progress Energy Carolinas, Inc.* (Shearon Harris Nuclear Power Plant, Units 2 and 3), CLI-10-9, 71 NRC 245, 270 (2010); *Progress Energy Florida, Inc.* (Levy County Nuclear Power Plant, Units 1 and 2), CLI-10-2, 71 NRC 27, 36-37 & n.44 (2010).

¹² *See, e.g., McGuire/Catawba*, CLI-02-28, 56 NRC at 379 (defining the scope of an admitted contention of omission that challenged an analysis in the applicant's environmental report for failing to consider potentially new and significant information); *see also Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-17, 56 NRC 1, 7-8 (2002) (affirming the Board's ruling admitting the contention discussed in CLI-02-28).

the earliest possible opportunity.¹³ As relevant here, contentions arising under the National Environmental Policy Act (NEPA) must be based on an applicant's Environmental Report.¹⁴ Failure to do so could result in dismissal of the contention as impermissibly late.¹⁵

A. Contention 2

In Contention 2, SACE and TEC argued that “[t]he Environmental Report fails to satisfy NEPA because it does not address the consequences of a fire in the spent fuel storage pool, nor does it demonstrate that a pool fire is remote and speculative.”¹⁶ They asserted that a discussion of the impacts from a spent fuel pool fire is entirely omitted and that TVA has not otherwise justified this omission by demonstrating that spent fuel pool accidents are remote and speculative.¹⁷ SACE and TEC referenced the D.C. Circuit's decision in *New York v. NRC*,¹⁸ in which the court, in evaluating whether the NRC had adequately evaluated the impacts of storing spent fuel prior to its delivery to a repository, concluded that the NRC was required under NEPA to address the environmental consequences of spent fuel pool accidents unless they could be found to be remote and speculative.¹⁹ SACE and TEC also cited the agency's Generic Environmental Impact Statement for License Renewal of Nuclear Plants (License Renewal GEIS),²⁰ in which the environmental impacts of spent fuel pool

¹³ See 10 C.F.R. § 2.309(f)(2).

¹⁴ *Id.*

¹⁵ See *DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-1, 81 NRC 1, 7 (2015).

¹⁶ SACE and TEC Petition at 9.

¹⁷ *Id.* at 9-10.

¹⁸ *Id.* at 9, 11 (citing *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012) (*New York I*)).

¹⁹ *New York I*, 681 F.3d at 482. In *New York I*, the D.C. Circuit vacated and remanded the agency's Waste Confidence Decision Update and Temporary Storage Rule, which pertained to the storage of spent fuel after cessation of reactor operation. See generally Final Rule, Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation, 75 Fed. Reg. 81,032 (Dec. 23, 2010); Waste Confidence Decision Update, 75 Fed. Reg. 81,037 (Dec. 23, 2010). In response to the court's remand, the NRC issued a generic environmental impact statement and final Continued Storage Rule. See generally Final Rule, Continued Storage of Spent Nuclear Fuel, 79 Fed. Reg. 56,238 (Sept. 19, 2014); Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel, 79 Fed. Reg. 56,263 (Sept. 19, 2014); Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel,” NUREG-2157 (Aug. 2014) (ML14188B749). Thereafter, several petitioners sought review of the Continued Storage Rule and the associated generic environmental impact statement in the D.C. Circuit; the court denied the petitions for review. *New York v. NRC*, 824 F.3d 1012 (D.C. Cir. 2016); see also *New York v. NRC*, No. 14-1210 (D.C. Cir. Aug. 8, 2016) (denying petition for rehearing *en banc*).

²⁰ SACE and TEC Petition at 9-10. The License Renewal GEIS, which covers plant operations
(Continued)

accidents were found to be “comparable to those from . . . reactor accidents at full power.”²¹

TVA did not dispute the lack of a specific analysis of spent fuel pool accident impacts in the Environmental Report. Rather, citing 10 C.F.R. § 50.150(a)(1), TVA argued that such an analysis was design-specific and not required until the combined license application stage.²² Further, TVA asserted that it intended the accident analysis in the Environmental Report to serve as ““a reasonable, bounding estimate of severe accident consequences”” for the small modular reactors under consideration for the Clinch River site.²³ TVA faulted SACE and TEC for not “demonstrat[ing] that there was anything inadequate about that analysis.”²⁴ TVA also argued that SACE and TEC “offer[ed] no information [claiming] that the analysis conducted by TVA does not bound spent fuel pool accident consequences.”²⁵

Additionally, TVA asserted that the conclusion in the License Renewal GEIS that the impacts of spent fuel pool accidents are encompassed within the impacts of full-power reactor accidents obviates the need for a specific analysis of spent fuel pool accidents in the Environmental Report.²⁶ The Staff raised a similar argument, but it also claimed that because TVA had cited the License Renewal GEIS in the Environmental Report, this effectively incorporated by reference the conclusion that spent fuel pool accidents are bounded by reactor accidents.²⁷ The Staff asserted that the License Renewal GEIS supports a more limited discussion of spent fuel pool accident impacts in the Environmental Report commensurate with the Staff’s finding in the License Renewal GEIS that spent fuel pool fires

for the period of a plant’s renewed license, is not to be confused with the generic environmental impact statement associated with the Continued Storage Rule, which covers the period of time after the licensed life of a plant.

²¹ “Generic Environmental Impact Statement for License Renewal of Nuclear Plants — Main Report” (Final Report), NUREG-1437, rev. 1, vols. 1, 2, and 3 (June 2013), at 1-28 (ML13106A241, ML13106A242, and ML13106A244) (2013 License Renewal GEIS).

²² TVA Answer at 19-20. Section 50.150(a)(1) sets out the requirement that certain applicants, including an applicant for a combined license under Part 52, include in the application a design-specific assessment of the proposed facility’s ability to withstand the impact of an aircraft crash. 10 C.F.R. § 50.150(a)(1).

²³ TVA Answer at 21 (quoting Clinch River Nuclear Site, Early Site Permit Application, Part 3, Environmental Report, rev. 0 (May 2016), § 7.2 (ML16144A145 (package)) (Environmental Report)). As is permissible for an early site permit application, TVA “uses technical information from various certified and proposed designs to develop a plant parameter envelope for facility characterization necessary to assess the suitability of the [Clinch River] site” rather than a particular design. Notice of Hearing, 82 Fed. Reg. at 16,437.

²⁴ TVA Answer at 21; *see also id.* at 23.

²⁵ *Id.* at 22.

²⁶ *See id.* at 22-23.

²⁷ *See* Staff Answer at 22-24.

are “‘highly remote.’”²⁸ According to the Staff, TVA’s statement in a different section of the Environmental Report — that the fuel cycle analyses in the License Renewal GEIS are relevant to the small modular reactors considered for the Clinch River site — constitutes sufficient consideration of the consequences of spent fuel pool fires.²⁹

The Board, however, was persuaded neither by the Staff’s argument that TVA had referenced a spent fuel pool accident analysis nor by TVA’s argument that such an analysis is not required at this time.³⁰ The Board admitted the contention as “strictly a contention of omission,” observing that “TVA might not be able to say very much about the risk of spent fuel pool fires[] at this early stage, but SACE and TEC have made a plausible case that TVA must say something.”³¹ We find no error in the Board’s reasoning in admitting the contention.

TVA’s main argument on appeal mischaracterizes the Board’s ruling. TVA asserts that the Board ignored the accident analysis in TVA’s Environmental Report, which TVA claims “sufficiently bounds any risk of a spent fuel pool fire.” TVA also claims that the Board would have TVA undergo a specific technical analysis that would require “detailed design information that is not currently available.”³² We disagree. As an initial matter, the Board did not direct a specific type of analysis, detailed or otherwise; rather, the Board left that open-ended. And the Board explained that if TVA were to “say something” about the impacts of spent fuel pool fires, the contention would become moot.³³ As the Board noted, a subsequent challenge to the adequacy of whatever analysis is supplied would need to meet the requirements for a new contention.³⁴

Moreover, the Board did not ignore, but rather was not satisfied with, the representations in TVA’s pleadings before the Board — repeated in TVA’s appeal — that the existing analysis in the Environmental Report bounds the consequences of a spent fuel pool accident.³⁵ The Board acknowledged that TVA had provided an analysis of “‘accidents with substantial damage to the reactor core and degradation of containment systems,’” but the Board found that TVA had included “no discussion at all concerning spent fuel pool fires.”³⁶ The Board

²⁸ *Id.* at 23-24 (quoting “Generic Environmental Impact Statement for License Renewal of Nuclear Plants — Main Report” (Final Report), NUREG-1437, vol. 1 (May 1996), at 6-75 (ML040690705), and citing 2013 License Renewal GEIS at 1-28, E-37).

²⁹ *Id.*

³⁰ LBP-17-8, 86 NRC at 158-59.

³¹ *Id.* at 160.

³² TVA Appeal at 5-6.

³³ LBP-17-8, 86 NRC at 160-61.

³⁴ *Id.* at 161; see 10 C.F.R. § 2.309(c)(1); *McGuire/Catawba*, 56 NRC at 383.

³⁵ See LBP-17-8, 86 NRC at 160; TVA Appeal at 6-15.

³⁶ LBP-17-8, 86 NRC at 160 (quoting Environmental Report at 7.2-1).

found instead that TVA had improperly placed the burden on SACE and TEC to demonstrate that spent fuel pool accident consequences would not be encompassed by TVA's accident analysis.³⁷ And even had the Board been persuaded by the argument that TVA had incorporated by reference the conclusions in the License Renewal GEIS with regard to spent fuel pool accidents, the Board noted that its applicability to small modular reactors had not been addressed.³⁸ In particular, the Board observed that although the License Renewal GEIS may stand for the general proposition "that spent fuel pool fires are on a comparable scale [to] reactor accidents, it does not establish that the environmental impacts of a spent fuel pool fire at a site with small modular reactors are necessarily encompassed by the impacts of a small modular reactor accident."³⁹

We also find unpersuasive TVA's related claim on appeal that a spent fuel pool fire analysis was not required at the early site permit stage because the focus of an early site permit is the alternative site analysis and "whether there is any obviously superior alternative to the site proposed."⁴⁰ While this is true, TVA nonetheless included, as it is permitted to do under the same rule, what appears to be a complete accident analysis.⁴¹ Thus, as SACE and TEC point out, "the omission . . . of any mention of spent fuel pool fire risks gives rise to an admissible contention."⁴²

In short, the Board admitted the contention based on SACE and TEC's identification of an omission in the Environmental Report and a demonstration that spent fuel pool accident consequences either must be considered or shown to be remote and speculative to satisfy the NRC's obligations under NEPA. This is sufficient for an admissible contention of omission.⁴³ TVA has not demonstrated that the Board erred in admitting Contention 2, and we find no grounds in the

³⁷ *Id.*

³⁸ *See id.* On appeal, TVA relies on "the analyses contained in" the Environmental Report's references to the License Renewal GEIS, as well as references to six early site permit applications for traditional light-water reactors, but these references are too general to be said to refer specifically to a discussion of spent fuel pool accident consequences. TVA Appeal at 10-11. At most, these references merely point to chapters in the referenced documents, without page numbers or references to specific analyses.

³⁹ LBP-17-8, 86 NRC at 160.

⁴⁰ 10 C.F.R. § 51.50(b)(1); *see* TVA Appeal at 6.

⁴¹ *See* 10 C.F.R. § 51.50(b)(2) ("The environmental report may address one or more of the environmental effects of construction and operation of a reactor, or reactors, which have design characteristics that fall within the site characteristics and design parameters for the early site permit application . . .").

⁴² SACE and TEC Response at 6.

⁴³ *See, e.g., McGuire/Catawba*, CLI-02-28, 56 NRC at 382-84.

record to reverse the Board's decision on this contention. We note, however, that the Staff has now issued the Draft Environmental Impact Statement.⁴⁴

B. Contention 3

In Contention 3, SACE and TEC asserted that even though TVA has chosen to defer until the combined license stage a discussion of need for power and energy alternatives,⁴⁵ SACE and TEC have identified what they claim to be "impermissible language" in TVA's Environmental Report that nonetheless addresses these issues.⁴⁶ SACE and TEC argued that TVA's decision to defer the discussion of need for power and energy alternatives "effectively [precludes them] from submitting contentions on those subjects"⁴⁷ and unfairly shields the language in the Environmental Report from challenge in the early site permit proceeding.⁴⁸ According to SACE and TEC, allowing this language to remain unchallenged, eventually to be included in the Staff's Environmental Impact Statement (EIS), risks the EIS "becoming an advertisement for [small modular reactors] rather than the rigorous, unbiased and independent scientific study required by NEPA."⁴⁹ In addition to seeking the removal of the language from the Environmental Report, SACE and TEC identified deficiencies in individual statements.⁵⁰

TVA and the Staff objected to the contention as, among other things, outside the scope of the proceeding and not material to the findings the Staff must make to support a decision on the early site permit application because TVA expressly

⁴⁴ "Environmental Impact Statement for an Early Site Permit (ESP) at the Clinch River Nuclear Site" (Draft Report for Comment), NUREG-2226, vols. 1 and 2 (Apr. 2018) (ML18100A220 and ML18100A223).

⁴⁵ See 10 C.F.R. § 51.50(b)(2).

⁴⁶ SACE and TEC Petition at 11. For example, SACE and TEC take issue with TVA's assertion in the Environmental Report "that building a [small modular reactor] 'near federal facilities' could provide 'enhanced reliability and other benefits, by providing continued operation during a widespread and extended loss of the electrical power grid, meeting reliability needs with clean energy that supports carbon reduction directives.'" *Id.* at 16 (quoting Environmental Report at 1-2). SACE and TEC claim that "Chapter 1 of the Environmental Report is brimming with claims that [small modular reactor] technology is preferable to other energy technology on a host of issues including safety, security, reliability, carbon reduction, water use, and economies of scale." *Id.* Additionally, SACE and TEC take issue with TVA's discussion of the "no action" alternative in Chapter 9, which according to SACE and TEC, "laments that . . . [the] asserted advantages of [small modular reactors] would be lost if TVA did not receive an [early site permit]." *Id.* SACE and TEC argue that these statements illustrate "bias and lack of rigor in TVA's discussion." *Id.* at 23.

⁴⁷ *Id.* at 11.

⁴⁸ See *id.* at 15.

⁴⁹ *Id.* at 12; see also *id.* at 19.

⁵⁰ See *id.* at 12, 15-23.

elected to defer consideration of need for power and energy alternatives until the combined license stage.⁵¹ The Board disagreed with TVA and the Staff, however, and it admitted the contention not as a challenge to the language in the Environmental Report, but rather because its potential use by the Staff in its EIS would contravene 10 C.F.R. § 51.75(b), which directs the Staff not to include a discussion of need for power or energy alternatives if they are not addressed in the Environmental Report.⁵² Noting that our rules of practice require contentions to be raised as soon as information becomes available, the Board found that SACE and TEC had raised their concerns “at the earliest opportunity.”⁵³ The Board observed that if the EIS “is scrubbed of any discussion that could violate 10 C.F.R. § 51.75(b), the . . . Staff may move for summary disposition.”⁵⁴ And although the Staff had asserted that it would comply with the directive in section 51.75(b), the Board did not see the Staff’s assurances as a proper basis for rejecting the contention.⁵⁵

On appeal, TVA argues that the statements with which SACE and TEC take issue are part of TVA’s general discussion of the “purposes and goals of the Clinch River project,” not a substantive discussion of need for power or energy alternatives.⁵⁶ In addition, TVA argues that the contention is premature because it is premised on the assumption that the Staff will violate section 51.75(b) before the EIS has been prepared.⁵⁷ And TVA argues that because there is no prohibition on an applicant describing the scope of its project in an early site permit application, SACE and TEC have raised what amounts to a general policy argument that cannot serve as the basis for an admissible contention.⁵⁸ For these reasons, TVA asserts that the Board erred in admitting a contention that raises no material dispute with the application.⁵⁹

We agree that Contention 3 failed to raise a genuine, material dispute with TVA’s early site permit application.⁶⁰ The determining factor is TVA’s state-

⁵¹ See, e.g., TVA Answer at 25-28; Staff Answer at 29-32.

⁵² LBP-17-8, 86 NRC at 163-64 (“An Environmental Report for an [early site permit] application ‘need not’ include ‘an assessment of the economic, technical, or other benefits (for example, need for power) and costs of the proposed action or an evaluation of alternative energy sources.’ The NRC’s Environmental Impact Statement for an [early site permit], in contrast, ‘must not’ include those very same subjects, unless the applicant has elected to address them at the [early site permit] stage.”); 10 C.F.R. §§ 51.50(b)(2), 51.75(b).

⁵³ LBP-17-8, 86 NRC at 162.

⁵⁴ *Id.* at 164.

⁵⁵ *Id.*

⁵⁶ TVA Appeal at 17.

⁵⁷ *Id.* at 18-22.

⁵⁸ *Id.* at 22-24.

⁵⁹ *Id.* at 16.

⁶⁰ See 10 C.F.R. § 2.309(f)(1)(vi).

ments, in the Environmental Report, that it has chosen to defer a discussion of need for power and energy alternatives until the combined license application, which it is permitted to do under 10 C.F.R. § 51.50(b)(2).⁶¹ As the Staff noted, “there is no dispute that TVA opted not to address alternative energy sources in the [early site permit] application,”⁶² nor is there a dispute that TVA opted not to address need for power.

SACE and TEC attempted to fashion a dispute with extraneous statements in the Environmental Report, but their arguments cannot stand against TVA’s express statement that TVA has exercised its option not to formally address these issues now. We have no reason to believe that TVA (or the Staff, for that matter) will recast the discussion of the project’s purpose into a need for power or energy alternatives discussion and thereby preempt challenges to a discussion of these issues in a future combined license proceeding, and we would not countenance such a result. Instead, as TVA and the Staff both acknowledged, should TVA file a combined license application, SACE and TEC will have an opportunity to raise any concerns they might have with the Environmental Report associated with that application, including any issues with TVA’s discussion of need for power and energy alternatives.⁶³ Because SACE and TEC have not raised a genuine, material dispute with the application, we find that the Board erred in admitting Contention 3.

III. CONCLUSION

For the foregoing reasons, we *affirm* the Board’s ruling with respect to Contention 2. We *reverse* the Board’s ruling with respect to Contention 3.

IT IS SO ORDERED.

For the Commission

Annette L. Vietti-Cook
Secretary of the Commission

Dated at Rockville, Maryland,
this 3d day of May 2018.

⁶¹ See Environmental Report at 8-1, 9.0-1.

⁶² Staff Answer at 30.

⁶³ See TVA Answer at 25; Staff Answer at 29.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Kristine L. Svinicki, Chairman
Jeff Baran
Stephen G. Burns

In the Matter of

Docket No. 50-609-CP

**NORTHWEST MEDICAL
ISOTOPES, LLC
(Medical Radioisotope Production
Facility)**

May 3, 2018

MANDATORY HEARINGS

Section 189a. of the Atomic Energy Act requires that the Commission hold a hearing on an application to construct a commercial production or utilization facility.

**MANDATORY HEARINGS, CONSTRUCTION PERMITS, SAFETY
ISSUES**

The Commission must determine whether: (1) the applicant has described the proposed design of the facility, including, but not limited to, the principal architectural and engineering criteria for the design, and has identified the major features or components incorporated therein for the protection of the health and safety of the public; (2) such further technical or design information as may be required to complete the safety analysis, and which can reasonably be left for later consideration, will be supplied in the final safety analysis report; (3) safety features or components, if any, that require research and development have been described by the applicant, and the applicant has identified, and there will be conducted, a research and development program reasonably designed to resolve any safety questions associated with such features or components; and (4) on the basis of the foregoing, there is reasonable assurance that (i) such

safety questions will be satisfactorily resolved at or before the latest date stated in the application for completion of construction of the proposed facility, and (ii) taking into consideration the site criteria contained in 10 C.F.R Part 100, the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public.

MANDATORY HEARINGS, CONSTRUCTION PERMITS, ADDITIONAL CONSIDERATIONS

In making these findings, the Commission is guided by the additional considerations in 10 C.F.R. § 50.40. The Commission considers whether: (1) the processes to be performed, the operating procedures, facility and equipment, the use of the facility, and other technical specifications, or the proposals, in regard to any of the foregoing collectively provide reasonable assurance that the applicant will comply with NRC regulations, including the regulations in 10 C.F.R. Part 20, and that the health and safety of the public will not be endangered; (2) the applicant is technically and financially qualified to engage in the proposed activities; (3) the issuance of the construction permit will not be inimical to the common defense and security or to the health and safety of the public; and (4) any applicable requirements of Subpart A of 10 C.F.R. Part 51 have been satisfied.

MANDATORY HEARINGS, NATIONAL ENVIRONMENTAL POLICY ACT

To satisfy its obligations under the National Environmental Policy Act (NEPA), the Commission must: (1) determine whether the requirements of NEPA section 102(2)(A), (C), and (E), and the applicable regulations in 10 C.F.R. Part 51 (the NRC regulations implementing NEPA), have been met; (2) independently consider the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken; (3) determine, after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, whether the construction permit should be issued, denied, or appropriately conditioned to protect environmental values; and (4) determine whether the NEPA review conducted by the Staff has been adequate.

MANDATORY HEARINGS, CONSTRUCTION PERMITS

If the Commission determines that the application meets the standards and requirements of the Atomic Energy Act and the NRC's regulations and that any

notifications to other agencies or bodies have been duly made, the Commission will issue a construction permit “in such form and containing such conditions and limitations” that it deems “appropriate and necessary.”

MANDATORY HEARINGS

The Commission does not review the application *de novo*; rather, it considers the sufficiency of the Staff’s review — that is, the Commission determines whether the Staff’s review was sufficient to support the required findings.

NATIONAL ENVIRONMENTAL POLICY ACT, ENDANGERED SPECIES ACT

Section 7 of the Endangered Species Act requires an agency, in consultation with and with the assistance of the Secretary of the Interior or the Secretary of Commerce (as appropriate), to ensure that “any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat of such species.”

NATIONAL ENVIRONMENTAL POLICY ACT

NEPA section 102(2)(A) requires agencies to use “a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts” in decisionmaking that may impact the environment.

NATIONAL ENVIRONMENTAL POLICY ACT

NEPA section 102(2)(C) requires the Commission to assess the relationship between local short-term uses and long-term productivity of the environment, to consider alternatives, and to describe the unavoidable adverse environmental impacts and the irreversible and irretrievable commitments of resources associated with the proposed action.

NATIONAL ENVIRONMENTAL POLICY ACT

NEPA section 102(2)(E) calls for agencies to study, develop, and describe appropriate alternatives.

MEMORANDUM AND ORDER

On January 23, 2018, we held a hearing on the application of Northwest Medical Isotopes, LLC (NWMI) for a permit to construct a medical radioisotope production facility in Columbia, Missouri.¹ The purpose of the evidentiary hearing was to consider the sufficiency of the NRC Staff's review of NWMI's application. As discussed below, we conclude that the Staff's review was adequate to support the findings set forth in our regulations. We authorize issuance of the construction permit.

I. BACKGROUND

A. Proposed Action

NWMI seeks to build a medical radioisotope production facility at the Discovery Ridge Research Park in Columbia, Missouri, to produce molybdenum-99. Molybdenum-99 decays to technetium-99m, a radioisotope used in tens of thousands of medical procedures daily in the United States.² NWMI requested and received an exemption to submit its construction permit application in two parts.³ It submitted Part 1 on February 5, 2015, and Part 2 on July 20, 2015.⁴

The Staff spent approximately 10,000 hours, with an additional 2,000 hours from outside technical experts, reviewing NWMI's application to determine whether it complies with the Atomic Energy Act of 1954, as amended (AEA), and the NRC's regulations.⁵ The Staff's review included an analysis of the environmental impacts of constructing, operating, and decommissioning the NWMI facility, in accordance with the National Environmental Policy Act of 1969

¹ See Northwest Medical Isotopes, LLC; Notice of Hearing, 82 Fed. Reg. 56,276 (Nov. 28, 2017) (Notice of Hearing); Tr. at 1-220 (attached to Order of the Secretary (Setting Deadline for Proposed Transcript Corrections) (Jan. 29, 2018) (unpublished) (as amended by Order of the Secretary (Adopting Proposed Transcript Corrections, Admitting Post-Hearing Exhibits, and Closing the Record of the Proceeding) (Feb. 22, 2018) (unpublished) (Transcript Correction Order))).

² Tr. at 17 (Mr. Fowler).

³ See Request to Submit a Two-Part Application — Northwest Medical Isotopes, LLC, 78 Fed. Reg. 63,501, 63,504 (Oct. 24, 2013).

⁴ See Northwest Medical Isotopes, LLC; Construction Permit Application, 80 Fed. Reg. 32,418, 32,418 (June 8, 2015) (docketing Part 1 of the application); Northwest Medical Isotopes, LLC, 81 Fed. Reg. 101, 102 (Jan. 4, 2016) (docketing Part 2 of the application). See generally Ex. NRC-006A to NRC-006I, Northwest Medical Isotopes, LLC, Construction Permit Application (Construction Permit Application). Staff exhibits NRC-007A to NRC-007J contain the non-public portions of the application, and, as such, they were filed on the non-public docket for this proceeding.

⁵ Tr. at 59-60 (Ms. Ross-Lee).

(NEPA).⁶ The Advisory Committee on Reactor Safeguards (ACRS), a committee of technical experts charged with reviewing and reporting on safety studies and applications for construction permits and facility operating licenses, provided an independent assessment of the safety aspects of the application.⁷ The ACRS recommended that the construction permit be issued.⁸

B. Review Standards

Section 189a. of the AEA requires that we hold a hearing on an application to construct a commercial production or utilization facility.⁹ The Staff published a notice of hearing in the *Federal Register* and provided an opportunity for interested members of the public to petition for leave to intervene.¹⁰ No petitions to intervene were filed. Therefore, there was no separate contested hearing.

We issued a second notice that set the time and place for the uncontested hearing and outlined the standards for our review.¹¹ The standards track the two major areas of focus for the review of a license application: the Staff's safety and environmental reviews. On the safety side, we must determine whether:

1. the applicant has described the proposed design of the facility, including, but not limited to, the principal architectural and engineering criteria for the design, and has identified the major features or components incorporated therein for the protection of the health and safety of the public;
2. such further technical or design information as may be required to com-

⁶ *Id.* at 61, 68-69.

⁷ Letter from Dennis C. Bley, Chairman, ACRS, to Kristine L. Svinicki, Chairman, NRC (Nov. 6, 2017), at 3 (ADAMS accession no. ML17310B511) (ACRS Letter); *see* AEA § 182b., 42 U.S.C. § 2232(b); 10 C.F.R. §§ 1.13, 50.58.

⁸ ACRS Letter at 1; *see* Letter from Victor M. McCree, Executive Director for Operations, to Dennis C. Bley, Chairman, ACRS (Dec. 8, 2017) (ML17324A412) (responding to the ACRS Letter).

⁹ AEA § 189a., 42 U.S.C. § 2239(a) (“The Commission shall hold a hearing after thirty days’ notice and publication once in the Federal Register, on each application under section 103 or 104b. for a construction permit for a facility, and on any application under section 104c. for a construction permit for a testing facility.”). The Staff determined that the proposed NWMI facility qualifies as a section 103 facility. *See* Tr. at 100 (Mr. Adams); Ex. NRC-001, “Staff Statement in Support of the Uncontested Hearing for Issuance of a Construction Permit for the Northwest Medical Isotopes, LLC Production Facility,” Commission Paper SECY-17-0116 (Nov. 16, 2017), at 7 (Staff Information Paper); Ex. NRC-008, Safety Evaluation Report Related to the Northwest Medical Isotopes, LLC Construction Permit Application for a Production Facility (Nov. 2017; revised Jan. 2018), at 1-5 to 1-6 (SER).

¹⁰ Medical Radioisotope Production Facility; Northwest Medical Isotopes, LLC, 81 Fed. Reg. 32,793, 32,793 (May 24, 2016).

¹¹ Notice of Hearing, 82 Fed. Reg. at 56,276-77.

plete the safety analysis, and which can reasonably be left for later consideration, will be supplied in the final safety analysis report;

3. safety features or components, if any, that require research and development have been described by the applicant, and the applicant has identified, and there will be conducted, a research and development program reasonably designed to resolve any safety questions associated with such features or components; and
4. on the basis of the foregoing, there is reasonable assurance that (i) such safety questions will be satisfactorily resolved at or before the latest date stated in the application for completion of construction of the proposed facility, and (ii) taking into consideration the site criteria contained in 10 C.F.R. Part 100, the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public.¹²

In making these findings, we are guided by the additional considerations in 10 C.F.R. § 50.40. We consider whether:

1. the processes to be performed, the operating procedures, facility and equipment, the use of the facility, and other technical specifications, or the proposals, in regard to any of the foregoing collectively provide reasonable assurance that the applicant will comply with NRC regulations, including the regulations in 10 C.F.R. Part 20, and that the health and safety of the public will not be endangered;
2. the applicant is technically and financially qualified to engage in the proposed activities;
3. the issuance of the construction permit will not be inimical to the common defense and security or to the health and safety of the public; and
4. any applicable requirements of Subpart A of 10 C.F.R. Part 51 have been satisfied.¹³

Overlapping this last consideration are the environmental findings that we must make to support issuance of the construction permit.¹⁴ The findings reflect our agency's obligations under NEPA, a statute that requires us to consider the impacts of NRC actions on environmental values.¹⁵ To ensure that these obligations are fulfilled for this construction permit proceeding, we must:

¹² 10 C.F.R. § 50.35(a); Notice of Hearing, 82 Fed. Reg. at 56,276-77.

¹³ 10 C.F.R. § 50.40(a)-(d).

¹⁴ See, e.g., *id.* § 51.105(a).

¹⁵ NEPA § 102(2), 42 U.S.C. § 4332(2); 10 C.F.R. § 51.10.

1. determine whether the requirements of NEPA section 102(2)(A), (C), and (E), and the applicable regulations in 10 C.F.R. Part 51, have been met;
2. independently consider the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken;
3. determine, after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, whether the construction permit should be issued, denied, or appropriately conditioned to protect environmental values; and
4. determine whether the NEPA review conducted by the NRC Staff has been adequate.¹⁶

If we determine that the application meets the standards and requirements of the AEA and the NRC's regulations and that any notifications to other agencies or bodies have been duly made, we will issue a construction permit "in such form and containing such conditions and limitations" that we deem "appropriate and necessary."¹⁷ We do not review NWMI's application *de novo*; rather, we consider the sufficiency of the Staff's review — that is, we determine whether the Staff's review was sufficient to support the required findings.¹⁸

C. The Hearing Process

The Staff completed its environmental review of the NWMI application in May 2017, with the publication of the Final Environmental Impact Statement (FEIS).¹⁹ The timeline of activities for the uncontested hearing, however, was triggered by the Staff's publication of the Safety Evaluation Report (SER) in

¹⁶ Notice of Hearing, 82 Fed. Reg. at 56,276-77 (citing 10 C.F.R. § 51.105).

¹⁷ 10 C.F.R. § 50.50.

¹⁸ See *SHINE Medical Technologies, Inc.* (Medical Radioisotope Production Facility), CLI-16-4, 83 NRC 58, 64 (2016); *Exelon Generation Co.* (Early Site Permit for Clinton ESP Site), CLI-05-17, 62 NRC 5, 34-36 (2005).

¹⁹ Ex. NRC-009, "Environmental Impact Statement for the Construction Permit for the Northwest Medical Isotopes Radioisotope Production Facility" (Final Report), NUREG-2209 (May 2017) (FEIS).

November 2017.²⁰ At that time we also received the Staff's information paper, which serves as the Staff's pre-filed testimony for the uncontested hearing.²¹

1. Pre-hearing Activities

We issued forty-nine questions on environmental and safety-related topics for NWMI and the Staff to answer in writing in advance of the hearing.²² In addition, we invited interested states, local government bodies, and federally recognized Indian Tribes to provide statements for us to consider as part of the uncontested proceeding.²³ The Missouri Department of Economic Development, the City of Columbia, Missouri, and the Boone County Commission submitted letters in support of the proposed NWMI facility.²⁴ The Missouri Department of Natural Resources offered comments on NWMI's construction permit application.²⁵ In addition, Senators Ron Wyden and Claire McCaskill submitted a letter in support of the application, asking us to give it full and fair consideration.²⁶

2. The Hearing

The scheduling note, issued to the parties before the hearing, set the topics for and the order of presentations at the hearing.²⁷ In the first panel, witnesses for NWMI and the Staff provided an overview of the construction permit application and the Staff's review. The next two panels focused on safety-related issues, and the final panel focused on environmental issues. The Staff made available thirty-eight witnesses at the hearing.²⁸ Fourteen of these witnesses were scheduled panelists; the remainder stood by to answer questions on topics relating to their

²⁰ Ex. NRC-008, SER, at i; *see* Internal Commission Procedures, ch. IV, "Commission Meetings/Hearings" (Mar. 24, 2016), at IV-11 to IV-20 (ML17297B791).

²¹ Ex. NRC-001, Staff Information Paper, at 1.

²² *See* Order of the Secretary (Transmitting Pre-Hearing Questions) (Dec. 13, 2017) (unpublished) (Pre-Hearing Questions). We also issued four questions that contain sensitive unclassified non-safeguards information and that therefore were filed on the non-public docket for the proceeding. The parties' responses to those questions, including a Staff response to a public question that contained non-public information, were also filed on the non-public docket.

²³ Notice of Hearing, 82 Fed. Reg. at 56,277.

²⁴ Ex. NWMI-008, Letters of Support (Dec. 29, 2017), at 2-4.

²⁵ Letter from Dru Buntin, Missouri Department of Natural Resources, to the Commission (Dec. 18, 2017) (ML17353A098).

²⁶ Ex. NWMI-008, Letters of Support, at 1.

²⁷ Memorandum from Annette L. Vietti-Cook, Secretary of the Commission, to NWMI and Counsel for the Staff (Jan. 16, 2018) (ML18016A763) (Scheduling Note).

²⁸ Tr. at 11.

expertise.²⁹ A total of seven witnesses offered testimony on behalf of NWMI on panels at the hearing and in pre-filed written testimony.³⁰

a. Summary of the Overview Panels

Nicholas Fowler, NWMI Chief Executive Officer; Carolyn Haass, NWMI Chief Operating Officer; Steven Reese, NWMI Irradiation Services Manager; and Roy Brown, Vice President of Government Affairs and Strategic Alliances for Curium Pharma (Curium), provided testimony for the NWMI overview panel.³¹ Mr. Fowler provided background on the company, its mission, and the location and general business model of the proposed facility.³² Mr. Brown described the need for a reliable domestic supply of molybdenum-99 and Curium's support of NWMI's construction permit application.³³ Ms. Haass and Dr. Reese described the general design of the facility, NWMI's production process, and considerations in preparing the construction permit application.³⁴

Michele Evans, Deputy Director for Reactor Safety Programs and Mission Support, Office of Nuclear Reactor Regulation (NRR); Mary Jane Ross-Lee, Deputy Director of the Division of Licensing Projects, NRR; Joseph Donoghue, Deputy Director of the Division of Materials and License Renewal, NRR; and Brian Smith, Deputy Director of the Division of Fuel Cycle Safety, Safeguards and Environmental Review, Office of Nuclear Material Safety and Safeguards (NMSS), provided background on the Staff's review of the construction permit application.³⁵ Ms. Evans provided background on the use of molybdenum-99 and the United States' policy to develop a domestic supply of the radioisotope.³⁶ Ms. Ross-Lee described the Staff's safety review and the regulatory standards by which the Staff conducted its review, and Mr. Donoghue discussed the Staff's environmental analysis.³⁷ Mr. Smith provided the Staff's findings in support of issuance of the construction permit.³⁸

²⁹ Scheduling Note at 1-5; Tr. at 11.

³⁰ See List of Anticipated Witnesses (Revision 1) (Jan. 16, 2018); Tr. at 14; Ex. NWMI-011-R, Applicant's Pre-Filed Testimony of Carolyn C. Haass (Jan. 16, 2018) (NWMI Pre-Filed Testimony).

³¹ Tr. at 17-55; Scheduling Note at 1.

³² Tr. at 17-22.

³³ *Id.* at 22-25.

³⁴ *Id.* at 26-37.

³⁵ Scheduling Note at 2; Tr. at 56-93.

³⁶ Tr. at 56-58.

³⁷ *Id.* at 58-70.

³⁸ *Id.* at 70-77.

b. Summary of the Safety Panels

The first safety panel focused on chapters 1 and 4 of the SER and the unique licensing considerations for the proposed NWMI facility.³⁹ Ms. Haass, Dr. Reese, and Gary Dunford, NWMI Process Engineering Manager, testified for NWMI, with Michael Corum, NWMI Senior Technical Advisor, joining them on the panel.⁴⁰ Alexander Adams, Chief of the Research and Test Reactors Licensing Branch, NRR; Michael Balazik, Project Manager, Research and Test Reactors Licensing Branch, NRR; David Tiktinsky, Senior Project Manager, Fuel Manufacturing Branch, NMSS; and Steven Lynch, Project Manager, Research and Test Reactors Licensing Branch, NRR, provided testimony for the Staff.⁴¹ In addition to chapters 1 and 4, SER chapters 2, 3, 5, 6, and 12 were subject to our examination during the first safety panel.⁴²

The second safety panel focused on chapter 13 of the SER, which addressed the applicant's analyses for radiological and chemical exposure accidents.⁴³ In particular, the discussion centered on the novel application of accident analysis methodologies from 10 C.F.R. Part 70.⁴⁴ Mr. Corum testified for NWMI, with Ms. Haass, Dr. Reese, and Mr. Dunford joining him on the panel.⁴⁵ Mr. Balazik; April Smith, Reliability and Risk Analyst, Programmatic Oversight and Regional Support Branch, NMSS; Mr. Tiktinsky; and James Hammelman, Senior Chemical Engineer, Fuel Manufacturing Branch, NMSS, provided testimony for the Staff.⁴⁶ Chapters 7, 8, 9, 11, 14, and 15 also were subject to our examination during the second safety panel.⁴⁷

c. Summary of the Environmental Panel

The environmental panel discussed the Staff's decision to prepare an environmental impact statement (EIS) for the NWMI facility, the scoping process, connected actions, the Staff's consultation with other agencies and Indian Tribes, the Staff's consideration of environmental impacts, and the Staff's analysis of

³⁹ Scheduling Note at 2-3; Ex. NWMI-005-R, U.S. Nuclear Regulatory Commission, Commission Mandatory Hearing, Safety Panel 1 Presentation (Jan. 16, 2018) (NWMI Safety Panel 1 Presentation); Ex. NRC-011, Northwest Medical Isotopes Construction Permit Application Review, Mandatory Hearing (Safety Panel 1) (Jan. 16, 2018) (Staff Safety Panel 1 Presentation).

⁴⁰ Tr. at 95-99; Scheduling Note at 2.

⁴¹ Tr. at 99-110; Scheduling Note at 2.

⁴² Scheduling Note at 3.

⁴³ *Id.* at 3-4.

⁴⁴ *Id.*

⁴⁵ Tr. at 128-32; Scheduling Note at 3.

⁴⁶ Tr. at 132-41; Scheduling Note at 3.

⁴⁷ Scheduling Note at 4.

alternatives to the proposed action.⁴⁸ Ms. Haass and Dr. Reese testified for NWMI.⁴⁹ Benjamin Beasley, Chief of the Environmental Review and NEPA Branch, NRR; Nancy Martinez, Physical Scientist, NRR; Michelle Moser, Biologist, NRR; and David Drucker, Senior Project Manager, NRR, provided testimony for the Staff.⁵⁰

After the hearing, we issued five additional questions for written answers from NWMI and the Staff.⁵¹ We admitted NWMI's and the Staff's responses as exhibits, adopted corrections to the hearing transcript, and closed the hearing record.⁵²

II. DISCUSSION

NWMI has represented that the final detailed design will be submitted as part of a future operating license application.⁵³ Although we authorize issuance of the construction permit, which, when issued, constitutes an authorization to NWMI to proceed with construction, our decision does not constitute approval of the design.⁵⁴

The discussion that follows provides a survey of the key facts that support our findings. We do not discuss every aspect of NWMI's construction permit application, the Staff's review, or our sufficiency review. Our decision to authorize issuance of the construction permit, however, is based on the record in its entirety.

A. The Proposed Design

Although the design described in the construction permit application is preliminary,⁵⁵ NWMI proposes to fabricate low-enriched uranium targets and ship

⁴⁸ *Id.* at 4-5.

⁴⁹ Tr. at 161-67; Scheduling Note at 4.

⁵⁰ Tr. at 167-86; Scheduling Note at 4.

⁵¹ Order of the Secretary (Transmitting Post-Hearing Questions) (Jan. 30, 2018) (unpublished) (Post-Hearing Questions).

⁵² Transcript Correction Order at 1.

⁵³ *See, e.g.*, Ex. NWMI-011-R, NWMI Pre-Filed Testimony, at 42; Tr. at 44-45, 47-48 (Ms. Haass); 10 C.F.R. § 50.35(c).

⁵⁴ *See* 10 C.F.R. § 50.35(b); Ex. NRC-008, SER, at 1-5.

⁵⁵ NWMI represented that at the time it submitted its construction permit application, its design was about forty to forty-five percent complete. It expects the design to be about eighty to eighty-five percent complete at the start of construction. Tr. at 44-45 (Ms. Haass).

them to one or more research reactors for irradiation.⁵⁶ NWMI would obtain low-enriched uranium from the U.S. Department of Energy for target fabrication.⁵⁷ After irradiation, these targets would be returned to the NWMI facility for processing to extract molybdenum-99.⁵⁸ Low-enriched uranium also would be recovered from the processed targets to fabricate new targets.⁵⁹

Aside from target irradiation, which would take place at either the University of Missouri Research Reactor, the Oregon State University TRIGA Reactor, or a third (as yet unidentified) reactor, NWMI's proposed activities all would take place within a single Radioisotope Production Facility (RPF) located on a site in the Discovery Ridge Research Park in Columbia, Missouri.⁶⁰ This includes the activities that fall within the definition of a 10 C.F.R. Part 50 "production facility" that are the subject of this licensing proceeding: receiving and processing irradiated low-enriched uranium targets from the research reactors, recovering and purifying molybdenum-99, and recovering and recycling low-enriched uranium to create new targets.⁶¹ But it also includes activities that will be the subject of future licensing actions before NWMI may operate the proposed facility. In addition to applying for and obtaining an operating license under 10 C.F.R. Part 50, NWMI will need to apply for and obtain a license under 10 C.F.R. Part 70 to receive, possess, and use special nuclear material in its operations, including the proposed target fabrication process.⁶²

⁵⁶ See Ex. NRC-006B, Construction Permit Application, Preliminary Safety Analysis Report, at 1-1.

⁵⁷ *Id.*

⁵⁸ *Id.*

⁵⁹ *Id.*

⁶⁰ *Id.* at 1-1, 1-16 to 1-18; Ex. NWMI-004-R, U.S. Nuclear Regulatory Commission, Commission Mandatory Hearing, Northwest Medical Isotopes, LLC Radioisotope Production Facility Overview (Jan. 16, 2018), at 3-4 (NWMI Overview Panel Presentation); see also Ex. NWMI-011-R, NWMI Pre-Filed Testimony, at 6, 22 (describing the proposed batch process, which would be based on whether targets are irradiated at the University of Missouri Research Reactor or the Oregon State University TRIGA Reactor).

⁶¹ Ex. NRC-008, SER, at 1-2; Ex. NRC-006B, Construction Permit Application, Preliminary Safety Analysis Report, at 1-1; Ex. NWMI-004-R, NWMI Overview Panel Presentation, at 3; see 10 C.F.R. § 50.2 ("production facility").

⁶² Ex. NRC-006B, Construction Permit Application, Preliminary Safety Analysis Report, at 1-1, 1-17; Tr. at 27 (Ms. Haass); see 10 C.F.R. pt. 70. NWMI also will require a byproduct material license under 10 C.F.R. Part 30 to process and ship molybdenum-99. Ex. NRC-006B, Construction Permit Application, Preliminary Safety Analysis Report, at 1-1; see 10 C.F.R. pt. 30. Additionally, any research reactor that partners with NWMI will submit a license amendment application to irradiate targets for the NWMI facility. See Tr. at 27 (Ms. Haass). And the holder of the Certificate of Compliance for the cask that NWMI plans to use to ship irradiated targets will seek to amend that Certificate of Compliance. See *id.* at 27-28, 40-41 (Ms. Haass).

In view of the fact that a future special nuclear material license application under 10 C.F.R. Part 70 will be required, NWMI's construction permit application includes a description of Part 50 activities and Part 70 activities in order to show the interfaces between the target fabrication area and the production facility.⁶³ Additionally, NWMI used 10 C.F.R. Part 70 to fulfill certain requirements for its construction permit application. For example, NWMI used the methodology described in 10 C.F.R. Part 70, Subpart H for its accident analysis.⁶⁴ NWMI prepared an Integrated Safety Analysis (ISA) Summary and identified accident sequences and their consequences, as well as preliminary items relied on for safety (IROFS).⁶⁵

NWMI stated that its proposed design incorporates safety-related and non-safety-related structures, systems, and components that NWMI further categorized based on whether they would be designed to meet the performance requirements in either (1) 10 C.F.R. § 70.61 for accidents, or (2) 10 C.F.R. Part 20 for normal operations.⁶⁶ As NWMI explained, "safety-related IROFS" are structures, systems, and components that would be required to meet the performance requirements in section 70.61.⁶⁷ "Safety-related non-IROFS" are structures, systems, and components "that provide reasonable assurance that the RPF can be operated without undue risk to the health and safety of workers, the public, and [the] environment," and include structures, systems, and components to meet the criteria in 10 C.F.R. Part 20 for normal operations.⁶⁸ "Non-safety-related" structures, systems, and components are those "related to production and delivery of products or services" that are not classified as "safety-related."⁶⁹

NWMI's Quality Assurance Program Plan is structured in accordance with these categories, with varying degrees of oversight depending on the purpose of the structure, system, or component. For example, the "full measure" of the plan, "Quality Level 1," will be applied to safety-related IROFS, "including items in which [their] failure or malfunction could directly or indirectly result in a condition that adversely affects workers, the public, [or the] environment, as

⁶³ Tr. at 28 (Ms. Haass).

⁶⁴ See Ex. NRC-006G, Construction Permit Application, Preliminary Safety Analysis Report, at 13-3, 13-6; Ex. NRC-008, SER, at 13-1; Tr. at 28 (Ms. Haass).

⁶⁵ Ex. NRC-006G, Construction Permit Application, Preliminary Safety Analysis Report, at 13-3; Ex. NRC-008, SER, at 13-1. IROFS are engineered or administrative controls or control systems that are applied to reduce the likelihood of an accident such that the event either becomes highly unlikely or its consequences are reduced to meet the performance requirements in 10 C.F.R. § 70.61. See 10 C.F.R. § 70.61(b)-(e).

⁶⁶ Ex. NWMI-005-R, NWMI Safety Panel 1 Presentation, at 3-4; Tr. at 95-97 (Dr. Reese).

⁶⁷ Ex. NWMI-005-R, NWMI Safety Panel 1 Presentation, at 4.

⁶⁸ *Id.*

⁶⁹ *Id.*

described in [section] 70.61.”⁷⁰ The plan covers the Part 50 production facility and the Part 70 target fabrication area, including shared systems between the two.⁷¹ NWMI’s seismic classification categories, which define the design standards for the integrity of facility structures, systems, and components, also take into account their intended function. “Seismic Category I” applies to IROFS and structures, systems, and components required to support shutdown of the RPF and to maintain the facility in a safe shutdown condition.⁷² “Seismic Category II” applies to structures, systems, and components designed to prevent structural failure during a safe-shutdown earthquake or whose interaction with Seismic Category I items could degrade the function of a safety-related structure, system, or component or “result in an incapacitating injury to occupants of the main control room.”⁷³ The “Non-seismic” Category applies to structures, systems, and components that are neither Category I nor Category II.⁷⁴ As part of its hearing materials, NWMI provided a list of major structures, systems, and components, together with their safety classification, quality assurance level, and seismic classification, to illustrate its design methodology.⁷⁵ For example, NWMI classifies the RPF structure as an IROFS with Quality Level 1 and Seismic Category I designations.⁷⁶

At the hearing, the Staff discussed the interface between Parts 50 and 70 and the scope of the Staff’s review of NWMI’s construction permit application.⁷⁷ The Staff explained that although NWMI’s application described proposed activities within the target fabrication area, its safety review focused on the proposed

⁷⁰ *Id.* at 5.

⁷¹ See Ex. NRC-006F, Construction Permit Application, Preliminary Safety Analysis Report, at C-1 (“NWMI’s [Quality Assurance Program Plan] has been developed to provide safety and reliability during design, construction, and operation . . . of the RPF.”); Ex. NRC-004, NRC Staff Revised Responses to Commission Pre-Hearing Questions (Jan. 16, 2018), at 5 (Staff Pre-Hearing Responses). The Staff’s responses to our pre-hearing questions are numbered separately from the cover pleading in Ex. NRC-004. Citations to this document refer to the page numbers of the responses.

⁷² Ex. NWMI-005-R, NWMI Safety Panel 1 Presentation, at 6.

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ *Id.* at 7.

⁷⁶ *Id.* When NWMI develops the technical specifications for the RPF, “[e]ach IROFS will need to be examined and will likely become the subject of a limiting condition of operation . . . [technical specification].” Ex. NRC-008, SER, at 14-2. The Staff stated that it “will review NWMI’s proposed technical specifications, including the translation of IROFS into technical specifications,” during its review of NWMI’s operating license application.” Ex. NRC-004, Staff Pre-Hearing Responses, at 29.

⁷⁷ Scheduling Note at 3; Ex. NRC-011, Staff Safety Panel 1 Presentation, at 6-7. We asked several questions both before and during the hearing to get a better understanding of this issue. See, e.g., Pre-Hearing Questions at 2-3, 17-19; Tr. at 193-94 (Commissioner Burns), 218-19 (Chairman Svinicki).

activities that would be licensed under Part 50.⁷⁸ As part of this review, however, the Staff considered activities within the target fabrication area to the extent that the area shares structures, systems, and components with the production facility (for example, “vessel cooling, ventilation, radioactive waste control, and instrumentation and control”).⁷⁹ The Staff’s findings in the SER “are limited to those required for licensing a production facility under 10 [C.F.R.] Part 50.”⁸⁰

The Staff stated that it evaluated NWMI’s descriptions of its structures, systems, and components, paying “special attention to design and operating characteristics, unusual or novel design features, and principal safety considerations.”⁸¹ The Staff evaluated the sufficiency of NWMI’s preliminary design in accordance with NRC regulations and used regulatory guidance, as applicable, to support its review.⁸² Because most of this guidance originally had been developed for completed facility designs, the Staff exercised “its technical judgment to determine the extent to which the guidance was relevant to the review of the . . . construction permit application.”⁸³ In particular, the Staff’s review was informed by the Final Interim Staff Guidance (ISG) Augmenting NUREG-1537, which it developed to aid the Staff in reviewing applications for radioisotope production facilities.⁸⁴ The Staff also determined that certain methodologies described in NUREG-1520, “Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility,” “are an acceptable way of demonstrating adequate safety” given the similarities in the design and operation of a radioisotope production facility and a fuel cycle facility licensed under 10 C.F.R. Part 70.⁸⁵

Consistent with this guidance, the Staff found that NWMI’s use of the methodology in 10 C.F.R. Part 70, Appendix H to develop its accident analysis —

⁷⁸ Ex. NRC-008, SER, at 1-3; Tr. at 105 (Mr. Tiktinsky).

⁷⁹ Ex. NRC-008, SER, at 1-3; Tr. at 105-06 (Mr. Tiktinsky).

⁸⁰ Ex. NRC-008, SER, at 1-3.

⁸¹ *Id.*

⁸² *Id.*; Tr. at 103 (Mr. Balazik).

⁸³ Tr. at 103 (Mr. Balazik); *see also* Ex. NRC-004, Staff Pre-Hearing Responses, at 1-5 (providing examples of areas where the Staff applied its technical judgment).

⁸⁴ Ex. NRC-001, Staff Information Paper, at 3-4 (citing Final Interim Staff Guidance Augmenting NUREG-1537, “Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Standard Review Plan and Acceptance Criteria,” for Licensing Radioisotope Production Facilities and Aqueous Homogenous Reactors, Parts 1 and 2 (ML12156A069 and ML12156A075) (Oct. 2012) (Final ISG Augmenting NUREG-1537)). *See generally* “Guidelines for Preparing and Reviewing Applications for Licensing Non-Power Reactors: Standard Review Plan and Acceptance Criteria,” NUREG-1537, Parts 1 and 2 (Feb. 1996) (ML12251A353 (package)).

⁸⁵ Ex. NRC-004, Staff Pre-Hearing Responses, at 2. *See generally* “Standard Review Plan for Fuel Cycle Facilities License Applications” (Final Report), NUREG-1520, rev. 2 (June 2015) (ML15176-A258) (NUREG-1520). The Final ISG Augmenting NUREG-1537 borrows extensively from NUREG-1520 for guidance on the sufficiency of an applicant’s facility description and accident analyses. Final ISG Augmenting NUREG-1537, Part 1, at v.

particularly NWMI's "application of the radiological and chemical consequence and likelihood criteria contained in the performance requirements of 10 C.F.R. § 70.61; designation of IROFS; and establishment of management measures" — is "an acceptable way of demonstrating adequate safety at radioisotope production facilities."⁸⁶ The Staff evaluated "[t]he preliminary . . . [IROFS] for the NWMI production facility . . . to ensure that they would adequately provide for the prevention of accidents and the mitigation of consequences of accidents."⁸⁷ The Staff focused its review of NWMI's accident analyses on the production facility, but the Staff also examined "[t]he target fabrication process . . . to determine whether operations in this area could introduce radiological and chemical hazards that significantly increased the accident consequences for the NWMI production facility licensed under the regulations of 10 [C.F.R.] Part 50."⁸⁸ Similarly, because NWMI's Quality Assurance Program Plan applies to the entire RPF, including the target fabrication area, the Staff reviewed the plan under 10 C.F.R. Part 50 and the guidance in NUREG-1537 and also considered "how the [plan] could be applied to [structures, systems, and components] shared between the 10 C.F.R. Part 50 production facility and the target fabrication area."⁸⁹

B. The Proposed Site

NWMI plans to construct the RPF on a 7.4 acre (3 hectare) site in the Discovery Ridge Research Park in Columbia, Missouri.⁹⁰ The Research Park is owned by the University of Missouri.⁹¹ The site "is primarily characterized by relatively flat surfaces" and was previously used for agriculture.⁹² It sits approximately 3.5 miles (5.6 kilometers) from the University of Missouri main campus.⁹³

The population within 5 miles (8 kilometers) of the NWMI facility site, based on 2010 estimates, is approximately 68,766.⁹⁴ The two permanent residences that are nearest to the NWMI facility site — one to the south and the other to the northeast — are both about one third of a mile (one half of a kilometer) from the center of the site.⁹⁵ Several industrial and transportation facilities are located within 5 miles (8 kilometers) of the site, including other facilities located within

⁸⁶ Ex. NRC-004, Staff Pre-Hearing Responses, at 26.

⁸⁷ Ex. NRC-008, SER, at 1-3.

⁸⁸ *Id.* at 13-6.

⁸⁹ Ex. NRC-004, Staff Pre-Hearing Responses, at 6.

⁹⁰ Ex. NRC-008, SER, at 2-2.

⁹¹ *See id.*; Ex. NRC-009, FEIS, at 2-1.

⁹² Ex. NRC-008, SER, at 2-2; Ex. NRC-009, FEIS, at 3-40.

⁹³ Ex. NRC-006B, Construction Permit Application, Preliminary Safety Analysis Report, at 2-1.

⁹⁴ Ex. NRC-008, SER, at 2-2.

⁹⁵ Ex. NRC-006B, Construction Permit Application, Preliminary Safety Analysis Report, at 2-10.

the Discovery Ridge Research Park.⁹⁶ The Columbia Regional Airport is located approximately 6.5 miles (10.4 kilometers) from the site.⁹⁷

The findings for the issuance of a construction permit require that we take into consideration the site criteria in 10 C.F.R. Part 100 to ensure that the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public.⁹⁸ The Part 100 criteria apply to nuclear reactors and therefore do not expressly apply to the NWMI facility, but the Staff considered principles similar to those in Part 100 in its review of the suitability of the proposed site.⁹⁹ The Staff reviewed NWMI's analyses of the geography and demography of the site; the proposed facility's interaction with nearby industrial, transportation, and military facilities; and site-specific issues relating to meteorology, hydrology, geology, seismology, and geotechnical engineering.¹⁰⁰ In addition, the Staff evaluated structures, systems, and components and equipment "designed to ensure safe operation, performance, and shutdown when subjected to extreme weather, floods, seismic events, missiles (including aircraft impacts), chemical and radiological releases, and loss of offsite power."¹⁰¹

In our pre-hearing questions, we asked the parties to address issues related to the proposed site in more detail, particularly regarding NWMI's commitment to conduct a site-specific geotechnical investigation for the operating license stage of the proceeding.¹⁰² In view of the application's description of a recent sinkhole occurring less than a mile from the site, as well as the presence of limestone solution features (such as caves and sinkholes) in Boone County, we asked NWMI to further discuss how these geotechnical features might manifest at the proposed site.¹⁰³ We also asked NWMI to describe the methods of geotechnical investigation that NWMI plans to use to detect caves and sinkholes and to describe the measures it would take to mitigate the effects of a cave roof collapse on the ground surface of the site.¹⁰⁴ We asked the Staff to explain its rationale for

⁹⁶ See Ex. NRC-008, SER, at 2-2; Ex. NRC-006B, Construction Permit Application, Preliminary Safety Analysis Report, at 2-41 to 2-42.

⁹⁷ Ex. NRC-008, SER, at A-20.

⁹⁸ 10 C.F.R. § 50.35(a)(4)(ii).

⁹⁹ Ex. NRC-001, Staff Information Paper, at 23.

¹⁰⁰ *Id.*

¹⁰¹ *Id.*

¹⁰² See, e.g., Pre-Hearing Questions at 4-6.

¹⁰³ Pre-Hearing Questions at 4-5 (citing Ex. NRC-006B, Construction Permit Application, Preliminary Safety Analysis Report, at 2-92).

¹⁰⁴ *Id.* at 5.

tracking NWMI's planned site-specific geotechnical investigation as a series of commitments to be fulfilled as part of NWMI's operating license application.¹⁰⁵

In response, NWMI stated that there are 418 documented sinkholes with a depth of 20 feet (6.1 meters) or greater within Boone County, 290 of which are located in the county's southwestern corner.¹⁰⁶ The documented sinkholes are considered to be relatively stable. The largest known sinkhole in the state (encompassing 700 acres (283 hectares)) is located in the western part of the county.¹⁰⁷ NWMI further explained that a preliminary geotechnical investigation was conducted at the Discovery Ridge site in 2011, which included one borehole sample on the proposed NWMI facility site.¹⁰⁸ This preliminary investigation "provided information on subsurface conditions, groundwater, and soil types, profiles, and stability" and informed NWMI's preparation of its construction permit application.¹⁰⁹ NWMI stated that its site-specific geotechnical investigation "will be conducted to ensure that the area does not have the potential for sinkholes."¹¹⁰ If the potential for sinkholes is identified, NWMI proposes to incorporate one of two alternatives in the final design of the RPF as part of its operating license application: "(1) excavate [the] site both vertically and horizontally to remove that potential and backfill with structural fill, or (2) install piers to bedrock to support the substructure if a sinkhole does occur."¹¹¹

The Staff stated that, based on its review of NWMI's application, it determined that "NWMI had given appropriate attention to site features affecting the design" and had satisfied the requirements in 10 C.F.R. § 50.34(a)(1)(i) and (a)(3).¹¹² The Staff explained that any changes to NWMI's design, be it to excavate and backfill the site or to install piers in the bedrock, would be implemented in accordance with NWMI's Quality Assurance Program Plan, which the Staff found to be satisfactory.¹¹³ Additionally, the Staff stated that it "would verify the adequacy of the management and implementation of such design changes through its construction inspection program and its review of the results of the

¹⁰⁵ *Id.*

¹⁰⁶ Ex. NWMI-001-R, Response to [] Commission's Public Pre-Hearing Questions (Jan. 16, 2018), at 8 (NWMI Pre-Hearing Responses). NWMI stated that the 2015 Boone County Hazards Mitigation Plan "shows that the project site is northeast of the nearest areas considered to have the potential for sinkholes." *Id.*

¹⁰⁷ *Id.*

¹⁰⁸ *Id.* at 9.

¹⁰⁹ *Id.*

¹¹⁰ *Id.*

¹¹¹ *Id.*

¹¹² Ex. NRC-004, Staff Pre-Hearing Responses, at 9.

¹¹³ *Id.* at 10.

site-specific geotechnical investigation.”¹¹⁴ The Staff also noted its determination to replace the regulatory commitments associated with the site-specific geotechnical investigation with a proposed permit condition that would require NWMI to submit the results of its investigation in a report to the NRC prior to the beginning of construction.¹¹⁵ The Staff revised the SER and the draft permit to include the proposed condition.¹¹⁶

Following the hearing, we asked the parties for comments on proposed revisions to the condition “intended to broaden the condition to ensure the detection of ‘any site features that could impact the final design bases of the facility.’”¹¹⁷ As revised, the condition would state:

Prior to the beginning of construction, NWMI shall (a) complete a geotechnical investigation to identify any potential voids that may adversely impact the stability of subsurface materials and foundation, soil and rock characteristics, and liquefaction potential at the site and (b) submit the results of this investigation, including any design changes made to the facility based on the findings of the investigation, in a report to the NRC. This condition terminates once NWMI submits the results of the geotechnical investigation in either this report or as part of its final safety analysis report, whichever occurs first.¹¹⁸

Neither NWMI nor the Staff has objected to the revision.¹¹⁹

As part of its geotechnical investigation, NWMI stated that borehole and soil compaction tests will be performed to characterize soil and rock and investigate soil liquefaction potential.¹²⁰ To identify subsurface anomalies such as caves or sinkholes, either electromagnetic mapping, electrical conductivity and resistivity imaging, or microgravity and surface wave spectral analysis will be used.¹²¹ NWMI also plans to have conducted “a complete mapping of the bedrock below

¹¹⁴ *Id.*

¹¹⁵ *Id.* at 11.

¹¹⁶ *Id.* (citing Ex. NRC-008, SER, at 2-17, A-1 to A-2, and A-4; Ex. NRC-002, Northwest Medical Isotopes, LLC, Docket No. 50-609, Medical Isotope Production Facility Construction Permit (Jan. 16, 2018), at 3 (Draft Construction Permit)).

¹¹⁷ Post-Hearing Questions at 2 (quoting Ex. NRC-004, Staff Pre-Hearing Responses, at 11).

¹¹⁸ *Id.*

¹¹⁹ Ex. NWMI-012, Response to [] Commission’s Public Post-Hearing Questions (Feb. 6, 2018), at 3 (NWMI Post-Hearing Responses) (also noting NWMI’s preference for tracking the investigation via commitments); Ex. NWMI-001-R, NWMI Pre-Hearing Responses, at 10; Ex. NRC-014, NRC Staff Responses to Commission Post-Hearing Questions (Feb. 6, 2018) (Staff Post-Hearing Responses) (response to post-hearing question 1); *see infra* section E (revising the Staff’s proposed permit condition).

¹²⁰ Tr. at 124 (Mr. Corum).

¹²¹ Ex. NWMI-012, NWMI Post-Hearing Responses, at 3.

the site . . . in case the NWMI final design warrants facility support using pylons that rest on the bedrock surface.”¹²²

C. Technical and Design Information for Later Consideration

In addition to the permit condition pertaining to the site-specific geotechnical survey, the Staff proposed two permit conditions pertaining to criticality safety and one permit condition pertaining to the Quality Assurance Program Plan.¹²³ The Quality Assurance Program Plan condition would require NWMI to implement the quality assurance program described in its Preliminary Safety Analysis Report and sets forth procedures for permissible changes to the program — that is, changes that do “not reduce the commitments in the program description.”¹²⁴ Part of the NRC’s construction inspection program would require the Staff to determine whether NWMI has implemented its quality assurance program.¹²⁵ The Staff stated that it recommended the permit condition to ensure implementation of the program, consistent with the requirements for other Part 50 facilities.¹²⁶

With regard to the criticality safety permit conditions, both must be completed prior to the completion of construction and both terminate when NWMI submits its final safety analysis report. One condition would require NWMI to submit periodic reports regarding the design of the Criticality Accident Alarm System (CAAS).¹²⁷ These reports also must demonstrate sufficient detector coverage to meet the requirements in 10 C.F.R. § 70.24(a).¹²⁸ Although the Staff was satisfied with NWMI’s criticality safety analysis for the purposes of the construction permit, the Staff sought to ensure that the final design will comply with NRC requirements.¹²⁹ Explaining the basis for this permit condition, the Staff stated that “the presence of permanently-installed shielding for the facility could interfere with the ability of detectors to detect the minimum accident of concern” and that if an evaluation of CAAS coverage “is not completed prior to installation of permanent shielding or other structural materials, there is a potential that the final design may not satisfy the detector coverage requirements . . . [in 10 C.F.R. §§] 70.24(a).”¹³⁰ In light of this potential, the Staff sought “assurance that the CAAS design will have the capability to detect the mini-

¹²² *Id.*

¹²³ Ex. NRC-008, SER, at A-1 to A-2; Ex. NRC-002, Draft Construction Permit, at 2-3.

¹²⁴ Ex. NRC-008, SER, at A-2; Ex. NRC-002, Draft Construction Permit, at 3.

¹²⁵ Tr. at 59 (Ms. Ross-Lee).

¹²⁶ *Id.*

¹²⁷ Ex. NRC-002, Draft Construction Permit, at 3.

¹²⁸ *Id.*

¹²⁹ See Ex. NRC-008, SER, at 6-19 to 6-20.

¹³⁰ *Id.* at 6-19.

imum accident of concern” and thus recommended including the CAAS permit condition.¹³¹

The second criticality safety permit condition would require NWMI to ensure, consistent with the revised upper subcritical limit “established in Revision 2 of NWMI’s Validation Report,” “that all nuclear processes are evaluated to be subcritical under all normal and credible abnormal conditions” for each area described in NWMI’s preliminary criticality safety evaluations and prior to each area being completed.¹³² In addition, NWMI would be required to submit periodic reports notifying the NRC whether NWMI’s revised upper subcritical limit required any change to NWMI’s criticality safety evaluations.¹³³ For this proposed permit condition, the Staff explained that the incorporation of additional benchmarks in NWMI’s Validation Report resulted in a new upper subcritical limit and noted that some of NWMI’s criticality calculations and design analysis may need to be redone at the operating license stage.¹³⁴ The Staff recommended the condition “in order to confirm that the applicant will integrate the revised [upper subcritical limit] in the criticality calculations and design analysis of the facility.”¹³⁵

As it finalizes the design of its facility, NWMI will need to undertake additional research and development. NWMI identified four areas for additional research and development: (1) testing to validate the acceptable operating conditions for material and target solution compatibility at the University of Missouri Research Reactor and U.S. Department of Energy National Laboratories; (2) laboratory resin testing to determine the interactions between solutions and resin as a function of temperature; (3) testing to confirm whether a pressure relief system is a feasible design for NWMI’s proposed ion exchange column; and (4) testing to evaluate the release of diamylamylphosphonate (DAAP), which

¹³¹ *Id.* A CAAS condition with similar requirements was included in the construction permit for the SHINE Medical Radioisotope Production Facility. See SHINE Medical Technologies, Inc., Construction Permit No. CPMIF-001 (Feb. 29, 2016), at 2-3 (ML16041A471).

¹³² Ex. NRC-002, Draft Construction Permit, at 2 (citing Ex. NRC-006E, Construction Permit Application, Preliminary Safety Analysis Report, § 6.3.1.1). Nuclear criticality safety limits are established to “ensure that all nuclear processes are subcritical, including an adequate margin of subcriticality for safety.” Ex. NRC-006E, Construction Permit Application, Preliminary Safety Analysis Report, at 6-30. “A common approach to ensuring subcriticality is to determine a maximum k_{eff} limit below which the licensee’s calculations must fall . . . referred to . . . as the [upper subcritical limit].” NUREG-1520, at 5-B-1. A k_{eff} of 1.0 is critical. The upper subcritical limit is defined as follows: “ k -subcritical = 1.0 – bias – bias uncertainty – margin of subcriticality for safety.” Final ISG Augmenting NUREG-1537, Part 1, at 39. And “[i]n general, a margin of subcriticality for safety of 0.05 has been found acceptable for typical nuclear processes involving [low-enriched uranium], without a detailed justification.” Final ISG Augmenting NUREG-1537, Part 1, at 39.

¹³³ Ex. NRC-002, Draft Construction Permit, at 2-3.

¹³⁴ Ex. NRC-008, SER, at 6-18.

¹³⁵ *Id.*

would be used in the uranium purification system, from the ion exchange column media during operation.¹³⁶ The Staff is tracking these items as regulatory commitments and will verify that they have been resolved prior to the completion of construction.¹³⁷

The Staff also will be tracking several other items listed as regulatory commitments in Appendix A of the SER that NWMI must include in the Final Safety Analysis Report with its operating license application.¹³⁸ For example, in response to deficiencies in NWMI's aircraft impact analysis identified in meetings with the ACRS and in the Staff's independent review,¹³⁹ NWMI committed to "reexamine and ensure the accuracy of its estimates for aircraft take-offs and landings at the Columbia Regional Airport and for the surrounding heliports."¹⁴⁰ NWMI also committed to ensure that the accident analyses contained in its Final Safety Analysis Report conform to the requirements in 10 C.F.R. § 70.61.¹⁴¹

¹³⁶ *Id.* at 13-24, A-37. The Staff explained in the SER that, among other things, the "[r]elease of DAAP . . . represents a potential criticality issue if [it] were to collect as a separate phase in a non-geometrically favorable vessel." *Id.* at A-37.

¹³⁷ *Id.* at A-37.

¹³⁸ *Id.*, App. A. Some of these commitments were identified in NWMI's responses to Staff requests for additional information; some were identified as a result of meetings with the ACRS. *See id.* at A-3, A-35; Tr. at 93.

¹³⁹ *See* Ex. NRC-008, SER, at 2-9 to 2-10.

¹⁴⁰ Ex. NRC-008, SER, at A-36. In recommending issuance of the construction permit, the ACRS noted that NWMI will reassess "[a]ircraft impact probabilities . . . as a part of the final design to show that either these probabilities are sufficiently low or that the facility is sufficiently protected from aircraft impact." ACRS Letter at 3.

We also asked NWMI to discuss its response to these deficiencies. *See* Pre-Hearing Questions at 4; Tr. at 126 (Commissioner Baran). NWMI attributed the deficiencies to the use of outdated information and inadequate peer review. Ex. NWMI-001-R, NWMI Pre-Hearing Responses, at 6. It stated that it "used a systematic process to evaluate the root cause in accordance with [its quality assurance program] and identified corrective actions to fix the deficiencies in the aircraft analysis in the [operating license application]." Ex. NWMI-001-R, NWMI Pre-Hearing Responses, at 6; *see also* Tr. at 126-27 (Mr. Corum). The Staff evaluated the corrective actions and found them to be adequate. Tr. at 127 (Mr. Adams).

¹⁴¹ Ex. NRC-008, SER, at A-4. We asked the parties a number of questions regarding NWMI's accident dose assessment methodology and the Staff's independent review. *See* Pre-Hearing Questions at 11-15. We also asked the parties to address the fact that NWMI had taken credit for an elevated release even though the proposed exhaust stack would sit only 10 feet above the top of the 65 foot RPF, rather than its being 2.5 times the height of the adjacent RPF, as advised in Regulatory Guide 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants." Tr. at 146-47 (Commissioner Baran); Post-Hearing Questions at 3. Among other things, the Staff stated that it found NWMI's dose calculations sufficient for the purposes of the construction permit application, noting in particular that NWMI has not requested approval of the stack height, NWMI has designated the stack as an IROFS, and NWMI

(Continued)

Additionally, NWMI committed to use NRC Regulatory Guide 1.60, “Design Response Spectra for Seismic Design of Nuclear Power Plants,” for the final seismic design with a ground acceleration response of 0.2 g — the same seismic design for the University of Missouri Research Reactor and for the Callaway Nuclear Power Plant.¹⁴² As part of its review, the Staff prepared “a general seismic design response spectrum incorporating site amplification factors for the proposed NWMI facility site.”¹⁴³ The Staff found the response acceptable for frequencies in the 1 to 10 hertz range of the design response spectrum, which tend to impact large structures, components, and equipment. The Staff identified, however, “a potential high-frequency (e.g., greater than 10 [hertz]) impact to electrical relays, piping, and instrumentation.”¹⁴⁴ Thus, NWMI committed to “provide an evaluation of the effects of high frequency spectral accelerations (i.e., [greater than] 10 hertz) on high-frequency sensitive structures, systems, and components” as part of its final design.¹⁴⁵

NWMI also provided a preliminary Emergency Response Plan that discusses provisions for coping with radiological emergencies and minimizing accident consequences.¹⁴⁶ Among other things, the plan describes “the activation process, assessment actions, corrective actions, and protective actions to be taken for each class of emergencies.”¹⁴⁷ Appendix A of the SER contains several commitments for NWMI to provide detailed emergency planning information when it submits its Final Safety Analysis Report.¹⁴⁸

D. The Staff’s Environmental Review

The Staff prepared an EIS to fulfill its obligations under NEPA because it determined that the preparation of an Environmental Assessment might not support a finding of no significant impact and because some of NWMI’s proposed

meeting the dose requirements in 10 C.F.R. Part 20. Tr. at 208 (Mr. Balazik). The Staff stated that “NWMI will develop appropriate models to estimate dose consequences as the design of the facility matures” and that the Staff “will perform additional analysis of NWMI’s dose calculations” during the operating license stage. Ex. NRC-014, Staff Post-Hearing Responses, at 3.

¹⁴² Ex. NRC-008, SER, at 2-16.

¹⁴³ *Id.*

¹⁴⁴ *Id.* The Staff noted that “[a] major factor affecting the high frequency response will be excavation depth of the site.” *Id.* NWMI will provide “additional information on the seismic requirements and evaluations of the NWMI facility and associated IROFS” in the operating license application. *Id.*

¹⁴⁵ *Id.* at A-35.

¹⁴⁶ *Id.* at 12-11; Ex. NRC-006F, Construction Permit Application, Preliminary Safety Analysis Report, at A-1.

¹⁴⁷ Ex. NRC-008, SER, at 12-16.

¹⁴⁸ *Id.* at A-16.

activities, namely the processing of uranium for target fabrication, are similar to activities that require an EIS under NRC regulations.¹⁴⁹ Although the Staff's safety review was limited to the findings necessary for issuance of the construction permit, the Staff's environmental review was broader in scope. The Staff evaluated the environmental impacts of facility construction, operations, and decommissioning, as well as the environmental impacts of transporting and irradiating the low-enriched uranium targets at offsite research reactors — an “interdependent part” of operating the proposed NWMI facility.¹⁵⁰ The Staff considered the impacts of irradiation services at the University of Missouri Research Reactor and the Oregon State University TRIGA Reactor and based its review of the impacts from a potential third research reactor using parameters from the Oregon State University TRIGA Reactor (for example, distance from the proposed NWMI facility and potential reactor modifications).¹⁵¹

The Staff issued the draft EIS (DEIS) in October 2016 and the FEIS in May 2017.¹⁵² The Staff held two public meetings near the site — a public scoping meeting in December 2015 and a meeting on the DEIS in December 2016.¹⁵³ The Staff also performed a site audit, during which the Staff, among other things, toured the proposed site and the University of Missouri Research Reactor.¹⁵⁴

The proposed site is located in a “shovel ready industrial park”¹⁵⁵ and has been disturbed, having previously been used for agriculture, mainly livestock grazing.¹⁵⁶ There are no surface water features on site.¹⁵⁷ “Common grass species currently cover the site, which provide low-quality habitat for wildlife and birds.”¹⁵⁸ The Staff considered the environmental impacts of the proposed action in the following resource areas: land use and visual resources, air quality and noise, geologic environment, ecological and water resources, historic and cultural re-

¹⁴⁹ Ex. NRC-001, Staff Information Paper, at 17.

¹⁵⁰ Ex. NRC-009, FEIS, at 1-6.

¹⁵¹ Ex. NRC-001, Staff Information Paper, at 19.

¹⁵² “Environmental Impact Statement for Construction Permit for the Northwest Medical Isotopes Radioisotope Production Facility” (Draft Report for Comment), NUREG-2209 (Oct. 2016) (ML16305A029); Ex. NRC-009, FEIS.

¹⁵³ Ex. NRC-009, FEIS, at xxi; *see* Northwest Medical Isotopes, LLC, 80 Fed. Reg. 72,115 (Nov. 18, 2015); Construction Permit Application for the Northwest Medical Isotopes, LLC, Medical Radioisotope Production Facility, 81 Fed. Reg. 78,865 (Nov. 9, 2016).

¹⁵⁴ Ex. NRC-009, Final EIS, at 1-4. In addition to its being a potential facility for the irradiation of NWMI targets, the University of Missouri Research Reactor was selected for analysis as an alternative site for constructing the NWMI facility. *Id.* at 5-1; *see infra* note 179 and accompanying text.

¹⁵⁵ Tr. at 176 (Ms. Moser).

¹⁵⁶ *Id.* at 175-76, 189.

¹⁵⁷ *Id.* at 176 (Ms. Moser).

¹⁵⁸ *Id.*

sources, socioeconomics, human health, waste management, and transportation.¹⁵⁹ It found that the direct and indirect impacts of the proposed action in each of these areas would be small.¹⁶⁰ Impacts are considered “small” if they “are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.”¹⁶¹ The Staff also determined that “it is not likely” that the construction, operations, and decommissioning of the proposed facility “would have disproportionately high and adverse human health and environmental effects on minority and low-income populations living near Discovery Ridge.”¹⁶²

To fulfill its obligations under section 7 of the Endangered Species Act of 1973, the Staff compiled a table of federally listed endangered species using, among other things, the U.S. Fish and Wildlife Service’s online database and the information in NWMI’s Environmental Report.¹⁶³ The Staff defined the action area for the purposes of this review to include the 7.4 acre (3 hectare) NWMI facility site, the temporary staging area that would be used for construction equipment, and “the surrounding area where runoff drains and activities would be audible to wildlife.”¹⁶⁴ The Staff found that the site provides unsuitable habitat for these species.¹⁶⁵ The Staff “did not identify any candidate species or proposed or designated critical habitats within the action area.”¹⁶⁶ The Staff therefore concluded “that [f]ederally listed, proposed, or candidate species are unlikely to occur within the action area.”¹⁶⁷ The Staff similarly found that state listed

¹⁵⁹ Ex. NRC-013, Northwest Medical Isotopes, Construction Permit Review, Mandatory Hearing (Environmental Panel) (Jan. 16, 2018), at 8 (Staff Environmental Panel Presentation). Additionally, the Staff considered potential cumulative impacts of the construction, operations, and decommissioning of the proposed NWMI facility. Ex. NRC-009, FEIS, at 4-65.

¹⁶⁰ Tr. at 176 (Ms. Moser).

¹⁶¹ Ex. NRC-009, FEIS, at 1-3.

¹⁶² *Id.* at 4-54 to 4-55.

¹⁶³ *Id.* at 3-43. Section 7 of the Endangered Species Act requires an agency, in consultation with and with the assistance of the Secretary of the Interior or the Secretary of Commerce (as appropriate), to ensure that “any action authorized, funded, or carried out by such an agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat of such species.” Endangered Species Act § 7(a)(2), 16 U.S.C. § 1536(a)(2). The Fish and Wildlife Service (under the Department of the Interior) and the National Marine Fisheries Service (under the Department of Commerce) jointly administer the act.

¹⁶⁴ Ex. NRC-009, FEIS, at 3-43.

¹⁶⁵ *Id.*

¹⁶⁶ *Id.*

¹⁶⁷ *Id.*

or endangered species are unlikely to occur within the proposed NWMI facility site.¹⁶⁸

In accordance with the National Historic Preservation Act of 1966, the Staff reviewed whether the proposed action would have any effect on historic and cultural resources. The Staff contacted thirty-one tribes, the Missouri State Historic Preservation Office, and the Advisory Council on Historic Preservation to initiate consultation under the act.¹⁶⁹ Six tribes provided input on the Staff's environmental review; one of these tribes requested consulting party status.¹⁷⁰ In response to this tribe's request, NWMI provided the results of a cultural resource survey that it had performed for its construction permit application, in which NWMI found no evidence of historic or cultural resources.¹⁷¹ After it had the opportunity to review the DEIS, the tribe indicated that it "did not anticipate that the proposed project would adversely impact any cultural resources or human remains protected under the [National Historic Preservation Act], NEPA, or other [f]ederal or Tribal laws."¹⁷² Based on its review of available historic information, tribal consultation, and NWMI's cultural resource survey, the Staff concluded that no known historic or cultural resources would be affected by the proposed project.¹⁷³ The Missouri State Historic Preservation Office concurred with the Staff's conclusion.¹⁷⁴

The Staff also analyzed alternatives to the proposed action.¹⁷⁵ This review included consideration of the no-action alternative, one alternative site, and two alternative technologies.¹⁷⁶ The Staff "evaluated each alternative using the same resource areas that were used in evaluating impacts from the proposed action."¹⁷⁷

For the no-action alternative, i.e., if the construction permit were to be denied, the Staff found that no changes would occur on the site, but the alternative also would not meet the purpose of the proposed action — to provide a domestic supply of molybdenum-99.¹⁷⁸ The Staff reviewed NWMI's site-selection process and examined one alternative site — the University of Missouri Re-

¹⁶⁸ *Id.* at 3-43 to 3-44. The Staff stated that although it was not required to do so given its "no effect" finding, it provided the DEIS to the Fish and Wildlife Service; the Department of the Interior responded that it had no comment. Tr. at 177 (Ms. Moser).

¹⁶⁹ Tr. at 177-78 (Ms. Moser); *see also* Ex. NRC-009, FEIS, at 4-25 to 4-26.

¹⁷⁰ Ex. NRC-004, Staff Pre-Hearing Responses, at 32.

¹⁷¹ *Id.*; Ex. NRC-009, FEIS, at 3-51.

¹⁷² Ex. NRC-004, Staff Pre-Hearing Responses, at 33.

¹⁷³ Ex. NRC-009, FEIS, at 3-51, 4-26 to 4-27.

¹⁷⁴ *Id.* at 3-51; Tr. at 178 (Ms. Moser).

¹⁷⁵ Ex. NRC-009, FEIS, ch. 5.

¹⁷⁶ *Id.* at 5-1.

¹⁷⁷ *Id.* at xxiv.

¹⁷⁸ *Id.* at 5-2.

search Reactor site.¹⁷⁹ The University of Missouri Research Reactor is eligible for inclusion on the National Register of Historic Places.¹⁸⁰ It is located 4 miles (6.4 kilometers) from the Discovery Ridge Research Park site.¹⁸¹

The Staff compared the environmental costs and benefits of the proposed action at the alternative site with the costs and benefits of the proposed action at the Discovery Ridge Research Park site. The Staff found that the impacts at the University of Missouri Research Reactor site would be small for all resource areas except for noise, which would be small to moderate.¹⁸² Additionally, there would be a potential adverse impact to historic properties at the University of Missouri Research Reactor site if the proposed NWMI facility (as located on that site) were to impact the University of Missouri Research Reactor's inclusion on the National Register of Historic Places.¹⁸³ Because the impacts in some resource areas potentially would be greater at the University of Missouri Research Reactor site, the Staff concluded that the Discovery Ridge site was the environmentally preferable alternative site.¹⁸⁴

Given the University of Missouri Research Reactor site's proximity to the Discovery Ridge site, we asked the Staff to elaborate on its conclusion that the two sites "likely cover the full spectrum of alternatives and provide sufficient information for sound decisionmaking."¹⁸⁵ The Staff explained that there were two main reasons for this determination. First, the Staff stated that "the spectrum of likely environmental impacts from the proposed action was relatively limited due to the small size of the proposed facility, the limited footprint and excavation required, and the use of county water rather than surface water or [groundwater] resources."¹⁸⁶ And second, the Staff stated that the two sites had different baseline environmental conditions — the University of Missouri Research Reactor site has existing buildings, a higher population, surface water features, and mature trees; while the Discovery Ridge site has been cleared and is devoid of existing buildings, surface water features, and mature trees.¹⁸⁷

The Staff selected two technologies for its alternatives analysis: uranium fission technology and linear accelerator-based technology.¹⁸⁸ The Staff initially considered the five technologies that had been awarded cooperative agreements

¹⁷⁹ *Id.* at 5-1.

¹⁸⁰ *Id.* at 3-67.

¹⁸¹ *Id.*

¹⁸² *Id.* at 5-85.

¹⁸³ *Id.*

¹⁸⁴ *Id.* at 5-88.

¹⁸⁵ Pre-Hearing Questions at 20 (quoting Ex. NRC-009, FEIS, at 5-7).

¹⁸⁶ Ex. NRC-004, Staff Pre-Hearing Responses, at 39.

¹⁸⁷ *Id.*

¹⁸⁸ Ex. NRC-009, FEIS, at 5-1.

by the Department of Energy's National Nuclear Security Administration: (1) neutron capture technology; (2) aqueous homogenous reactor technology; (3) selective gas extraction technology; (4) uranium fission technology; and (5) linear accelerator-based technology.¹⁸⁹ The Staff determined, however, that sufficient data to describe the environmental impacts of these technologies existed only for the uranium fission and linear accelerator-based alternatives, and thus the Staff selected these technologies for in-depth evaluation.¹⁹⁰ The Staff concluded that each of these technologies, if constructed, operated, and decommissioned at the Discovery Ridge site, would have similar environmental costs and benefits to NWMI's proposed production process.¹⁹¹

Considering the results of its environmental review, the Staff recommended the issuance of the construction permit to NWMI.¹⁹² At the operating license stage, the Staff will prepare a supplement to the FEIS to address any new and significant information that was not available during its review of the construction permit application.¹⁹³ Because the Staff also considered the impacts of target fabrication as well as transporting and irradiating targets at research reactors, the Staff stated that it likely will use a similar process to identify new and significant information for its environmental review of other licensing actions associated with operating the NWMI facility, including the Part 70 license application and any research reactor license amendment requests.¹⁹⁴

¹⁸⁹ *Id.* at 5-53 to 5-54.

¹⁹⁰ *Id.* at 5-55.

¹⁹¹ *Id.* at 5-87 to 5-88.

¹⁹² *Id.* at 6-11.

¹⁹³ Ex. NRC-004, Staff Pre-Hearing Responses, at 33.

¹⁹⁴ *Id.* at 33-34. NWMI seeks to begin construction of the RPF, including the Part 70 target fabrication area, upon issuance of the construction permit. Ex. NWMI-010, Letter from Carolyn C. Haass, NWMI, to NRC Document Control Desk (Dec. 18, 2017), at 3 (Exemption Request). On December 18, 2017, NWMI applied for an exemption from 10 C.F.R. § 70.21(f), which requires "[a]n application for a license to possess and use special nuclear material for processing and fuel fabrication, scrap recovery or conversion of uranium hexafluoride, or for the conduct of any other activity which the Commission has determined pursuant to [10 C.F.R. Part 51, Subpart A] will significantly affect the quality of the environment shall be filed at least 9 months prior to commencement of construction of the plant or facility in which the activity will be conducted, and shall be accompanied by an Environmental Report." 10 C.F.R. § 70.21(f). According to NWMI, its exemption request is supported by the FEIS because it determined that RPF activities, including target fabrication, will not "affect the quality of the environment after weighing the environmental, economic, technical and other benefits against environmental costs and considering available alternatives." Ex. NWMI-010, Exemption Request, at 3 (quoting 10 C.F.R. § 70.23(a)(7)). NWMI's exemption request is a separate licensing action and not necessary to the decision we make today authorizing issuance of the construction permit. The Staff will review and make a determination on the request in due course. Tr. at 211 (Mr. Lynch). The Staff stated, however, that construction

(Continued)

E. Findings

We have conducted an independent review of the sufficiency of the Staff's safety findings, with particular attention to the topics discussed above. Our findings, however, are based on the record as a whole. Based on the evidence presented in the uncontested hearing, including the Staff's review documents and the testimony provided, we find that NWMI has described the proposed design of the facility, including, but not limited to, the principal architectural and engineering criteria for the design, and it has identified major features or components incorporated therein for the protection of the health and safety of the public. Further technical or design information as may be required to complete the safety analysis has reasonably been left for later consideration and will be supplied in the Final Safety Analysis Report. NWMI has described the safety features or components that require research and development and has identified and will establish a research and development program reasonably designed to resolve any safety questions associated with these features or components. On the basis of the foregoing, we find that there is reasonable assurance that open safety questions will be resolved satisfactorily at or before the latest date stated in the application for completion of construction of the proposed facility. Taking into consideration the site criteria in 10 C.F.R. Part 100, the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public.

In making these findings, we also conclude that: (1) there is reasonable assurance that construction of the facility will not endanger the health and safety of the public, and the authorized activities can be conducted in compliance with the NRC's regulations, including the requirements in 10 C.F.R. Part 20; (2) NWMI is technically and financially qualified to engage in the activities authorized;¹⁹⁵ (3) issuance of the construction permit will not be inimical to the common defense and security or to the health and safety of the public;¹⁹⁶ and (4) NWMI's application meets the standards and requirements of the AEA and the NRC's regulations. Required notifications to other agencies or bodies have been duly made.¹⁹⁷ Additionally, the Staff should revise the permit condition regarding the site-specific geotechnical investigation as stated in section II.B, above. With that revision, we find that the Staff's proposed permit conditions are

of the target fabrication portion of the RPF "before submitting a 10 C.F.R. Part 70 application and without obtaining exemptions from 10 C.F.R. §§ 70.21(f) or 70.23(a)(7)" would be at NWMI's own risk. Ex. NRC-014, Staff Post-Hearing Responses, at 6; *see also* Tr. at 211 (Mr. Lynch).

¹⁹⁵ *See, e.g.*, Ex. NRC-008, SER, ch. 15.

¹⁹⁶ *See, e.g., id.*

¹⁹⁷ *See, e.g.*, 10 C.F.R. § 2.104(a); Ex. NRC-009, FEIS, at 1-7 to 1-8.

appropriately drawn and sufficient to provide reasonable assurance of adequate protection of public health and safety.¹⁹⁸

We also conducted an independent review of the Staff's environmental analysis in the FEIS, taking into account the particular requirements of NEPA. NEPA section 102(2)(A) requires agencies to use "a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts" in decisionmaking that may impact the environment.¹⁹⁹ We find that the environmental review team used the systematic, interdisciplinary approach that NEPA requires.²⁰⁰

NEPA section 102(2)(C) requires us to assess the relationship between local short-term uses and long-term productivity of the environment, to consider alternatives, and to describe the unavoidable adverse environmental impacts and the irreversible and irretrievable commitments of resources associated with the proposed action.²⁰¹ The discussion of alternatives is in chapter 5 of the FEIS; the other items are discussed in chapter 6.²⁰² The environmental review team found that the short-term uses of the environment — construction, operations, and decommissioning of the NWMI facility — would commit land and energy indefinitely or permanently.²⁰³ In addition, the project would bring increased employment, expenditures, and tax revenues that would directly benefit local, regional, and state economies in the short term.²⁰⁴ After the facility is decommissioned, wildlife may return to the site if it is restored to suitable habitat, but the use of land to meet waste disposal needs would reduce its long-term productivity.²⁰⁵ The installation of service lines (electric power and water, for example) during construction of the proposed facility "would be available and beneficial for future use" after decommissioning.²⁰⁶

Chapter 6 of the FEIS includes a chart of the unavoidable adverse environmental impacts during construction, operations, and decommissioning, along with actions to mitigate those impacts.²⁰⁷ The environmental review team found

¹⁹⁸ See 10 C.F.R. §§ 50.35(b), 50.50; Ex. NRC-002, Draft Construction Permit, at 3-4.

¹⁹⁹ NEPA § 102(2)(A), 42 U.S.C. § 4332(2)(A).

²⁰⁰ See, e.g., Tr. at 168-84 (providing an overview of the Staff's environmental review methodology and findings); Ex. NRC-013, Staff Environmental Panel Presentation, at 5-15. The environmental review team consisted of twelve individuals with expertise in disciplines including biology, geology, hydrology, human health, socioeconomics, and cultural resources. Ex. NRC-009, FEIS, at 8-1 to 8-2 (listing contributors from the NRC and Idoneous Consulting).

²⁰¹ NEPA § 102(2)(C)(ii)-(v), 42 U.S.C. § 4332(2)(C)(ii)-(v).

²⁰² Ex. NRC-009, FEIS, chs. 5-6.

²⁰³ *Id.* at 6-10.

²⁰⁴ *Id.*

²⁰⁵ *Id.*

²⁰⁶ *Id.*

²⁰⁷ *Id.* tbl.6-2.

that the unavoidable adverse impacts of the project would be small for all resource areas.²⁰⁸ Examples of measures to mitigate these impacts include restoring agricultural land temporarily affected during construction with native species of vegetation and preventing fugitive dust by watering unpaved and disturbed areas.²⁰⁹

Finally, with regard to irreversible and irretrievable commitments of resources, the environmental review team concluded that construction of the NWMI facility would irretrievably consume construction materials (for example, concrete, granular material, steel, and asphalt), unless NWMI recycles them after decommissioning.²¹⁰ During operations, uranium would be irreversibly and irretrievably committed.²¹¹ Additionally, birds would be lost to collisions with facility structures.²¹² The Staff also found that electricity, fuel, and water would be expended, but that the amounts used for constructing, operating, and decommissioning the NWMI facility would not be “expected to deplete available supplies or exceed available system capacities.”²¹³

We must weigh these unavoidable adverse environmental impacts and resource commitments — the environmental “costs” of the project — against the project’s benefits.²¹⁴ Considering the need for a reliable supply of medical isotopes in the United States and the expected increase in jobs and tax revenue, we find that the benefits of the project outweigh the costs described above. Moreover, we have considered each of the requirements of NEPA section 102(2)(C) and find nothing in the record that would lead us to disturb the Staff’s conclusions on those requirements.

NEPA section 102(2)(E) calls for agencies to study, develop, and describe appropriate alternatives.²¹⁵ The alternatives analysis is the “heart of the environmental impact statement.”²¹⁶ Based on the Staff’s testimony at the hearing, as well as the discussion in the FEIS, we find that the environmental review identified an appropriate range of alternatives with respect to the no-action alternative, alternative technologies, and alternative sites and adequately described the environmental impacts of each alternative.²¹⁷ We find reasonable the Staff’s conclusion that “the environmentally preferred alternatives are the construction,

²⁰⁸ *Id.* at 6-5.

²⁰⁹ *Id.*

²¹⁰ *Id.* at 6-11.

²¹¹ *Id.*

²¹² *Id.*

²¹³ *Id.*

²¹⁴ *Cf.* 10 C.F.R. § 51.105(a).

²¹⁵ NEPA § 102(2)(E), 42 U.S.C. § 4332(2)(E).

²¹⁶ 10 C.F.R. pt. 51, subpt. A, app. A, § 5.

²¹⁷ *See, e.g.,* Tr. at 178-81; Ex. NRC-009, FEIS, ch. 5.

operations, and decommissioning of the NWMI facility at the Discovery Ridge site . . . , the linear accelerator-based facility at the Discovery Ridge site. . . , [and] the subcritical fission-based facility at the Discovery Ridge site.”²¹⁸

In sum, for each of the topics discussed at the hearing and in today’s decision, we find that the Staff’s review was reasonably supported in logic and fact and sufficient to support the Staff’s conclusions. Based on our review of the FEIS, we also find that the remainder of the FEIS was reasonably supported and sufficient to support the Staff’s conclusions. Therefore, as a result of our review of the FEIS, and in accordance with the Notice of Hearing for this uncontested proceeding, we find that the requirements of NEPA section 102(2)(A), (C), and (E), and the applicable regulations in 10 C.F.R. Part 51, have been satisfied with respect to the construction permit application. We independently considered the final balance among conflicting factors contained in the record of this proceeding. We find, after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, that the construction permit should be issued.

III. CONCLUSION

We find that, with respect to the safety and environmental issues before us, the Staff’s review of NWMI’s construction permit application was sufficient to support issuance of the construction permit. We *authorize* the Director of the Office of Nuclear Reactor Regulation to issue the permit for the construction of the NWMI Medical Radioisotope Production Facility, contingent upon inclusion of the revised permit condition described in Section II.B. Additionally, we *authorize* the Staff to issue the record of decision, subject to its revision as necessary to reflect the findings in this decision.

IT IS SO ORDERED.

For the Commission

Annette L. Vietti-Cook
Secretary of the Commission

Dated at Rockville, Maryland,
this 3d day of May 2018.

²¹⁸ See Ex. NRC-009, FEIS, at 6-4 to 6-5.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

Marc L. Dapas, Director

In the Matter of

Docket No. 40-9083
(License No. SUC-1593)

U.S. ARMY INSTALLATION
MANAGEMENT COMMAND
(Pohakuloa Training Area)

May 15, 2018

By e-mail dated March 16, 2017, Dr. Michael Reimer (Petitioner) filed with the Executive Director for Operations pursuant to section 2.206, "Requests for Action Under This Subpart," of Title 10 of the *Code of Federal Regulations* (10 C.F.R. § 2.206), as supplemented on April 10, May 21, June 25, July 24, August 16, August 18, October 11, October 12, October 15, and November 10, 2017, and January 15, 2018, a petition requesting that the U.S. Nuclear Regulatory Commission (NRC) reconsider the issuance of Amendment No. 2 to Source Materials License No. SUC-1593, for the U.S. Army Installation Management Command's (Licensee's) Pohakuloa Training Area (PTA).

As the basis for the request, the Petitioner asserted that the Environmental Radiation Monitoring Program (ERMP) for the licensed depleted uranium (DU) that is located in the radiation control areas (RCAs) at the PTA is inadequate to detect DU leaving the RCAs. In support of the request, the Petitioner raised specific concerns regarding the adequacy of the ERMP. The following concerns were accepted for review under the 10 C.F.R. § 2.206 process: (1) inappropriate number of sediment samples; (2) inappropriate frequency of sediment sampling; (3) inappropriate and poorly described analytical techniques (sample analysis methods); (4) inappropriate geological sampling procedures for sediment collection; and (5) inappropriate data evaluation methods (leading to dilution of samples) to determine the presence of Davy Crockett DU outside the ranges associated with the PTA. On November 29, 2017, the NRC requested that the Licensee voluntarily respond to questions regarding composite sediment sam-

pling at the PTA. The Licensee responded to the request on December 15, 2017, and January 19, 2018.

The proposed decision was provided to the Petitioner and Licensee for comment on February 20, 2018. Comments were received from the Petitioner on March 13, 2018. After evaluating the concerns, including the information in the petition and its supplements, the Licensee's voluntary response to questions on composite sampling at the PTA, and the Petitioner's comments on the proposed decision, the director determined that there is no basis for granting the Petitioner's request to modify, suspend, or take other action with respect to Source Materials License No. SUC-1593 under 10 C.F.R. § 2.206. The rationale for this decision is summarized below.

- (1) The Staff found that a single sediment sampling location is adequate for the PTA ERMP. This approach was found to be acceptable by the Staff because it is consistent with the Programmatic ERMP. The Staff found that limited sampling is acceptable based on the surface water hydrology, the low potential for DU migration, and due to the small risk posed by the material.
- (2) The Staff found the proposed frequencies, analyses, and actions sufficient to ensure DU migration outside of the RCA is adequately monitored while not exposing personnel to undue risk due to accessing unexploded ordnance areas. The sediment sampling frequency for the PTA is considered by the Staff to be conservative, and therefore adequate because it exceeds the sampling frequency recommended for effluents from pressurized water reactors, for a site with a much lower potential all-pathway dose.
- (3) The Staff determined in its safety evaluation report (SER) for License Amendment No. 2 that the two-step analysis method (i.e., using inductively coupled plasma mass spectrometry only as a confirmatory technique for samples with a U-238/U-234 ratio above 3.0) is appropriate. Based on the comparison of the minimum detectable concentration of the Licensee's proposed method to the NRC soil screening values, the Staff continues to find the Licensee's proposed use of alpha spectrometry to be appropriate. The Staff found that the natural variation in the U-238 to U-234 ratio in the environment did not affect the Staff's conclusion about the adequacy of the Licensee's proposed method of evaluation including the use of a 3-to-1 ratio of U-238 to U-234. The Staff previously determined in the SER for License Amendment No. 2 that the methods described in the PTA ERMP and Programmatic Uniform Federal Policy — Quality Assurance Project Plan (UFP-QAPP) were sensitive enough. Through inspection, the Staff may inspect the data collected from im-

plementation of the PTA ERMP to verify that the sensitivity remains appropriate.

- (4) The Petitioner expresses concerns about the adequacy of the Licensee's geological training for individuals tasked with implementing the environmental monitoring program, but does not specify why geological training is necessary to take samples sufficient for the purposes of the PTA ERMP or the Programmatic ERMP. The NRC does not require geological training to implement the PTA ERMP. In its SER for License Amendment No. 1, the Staff found the Licensee's commitments regarding training acceptable. In its application for License Amendment No. 2, the Licensee made training commitments with regard to implementation of the ERMP in its UFP-QAPP and Programmatic Radiation Safety Plan, and the Staff found them acceptable as detailed in its associated SER. The Licensee did not commit to requiring geological training to implement the PTA ERMP or the Programmatic ERMP.
- (5) The Licensee clarified that the "composite" samples were all taken in essentially one location and a provision for taking 10 sub-samples was included to ensure sufficient sample volume was collected. Based on the Licensee's clarification, the Staff determined that dilution is not a concern as the sub-samples are more representative of a single sample than a "composite" sample.

Accordingly, the director denied the Petitioner's request in the final Director's Decision, dated May 15, 2018. The Petitioner's March 13, 2018, comments and the director's response to them are included as an attachment to the final Director's Decision.

DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206

I. INTRODUCTION

By letter dated March 16, 2017,¹ as supplemented on April 10,² May 21,³

¹ Agencywide Documents Access and Management System (ADAMS) Accession No. ML17110-A308.

² ADAMS Accession No. ML17250A248.

³ ADAMS Accession No. ML17143A165.

June 25,⁴ July 24,⁵ August 16,⁶ August 18,⁷ October 11,⁸ October 12,⁹ October 15,¹⁰ and November 10, 2017,¹¹ and January 15, 2018,¹² Dr. Michael Reimer (the Petitioner) filed a petition pursuant to Title 10 of the *Code of Federal Regulations* (10 C.F.R.), section 2.206, “Requests for action under this subpart,” with the U.S. Nuclear Regulatory Commission (NRC or the Commission).¹³

The Petitioner requested that the NRC reconsider the issuance of Amendment No. 2 to Source Materials License No. SUC-1593 (license),¹⁴ for the U.S. Army Installation Management Command’s (Licensee’s) Pohakuloa Training Area (PTA). As the basis for the request, the Petitioner asserted that the Environmental Radiation Monitoring Plan (ERMP)¹⁵ for the licensed depleted uranium (DU) that is located in the radiation control areas (RCAs) at the PTA is inadequate to detect DU leaving the RCAs. In the petition and its supplements, the Petitioner stated specific concerns about the lack of air monitoring and soil sampling at the PTA; the appropriateness of the sediment sampling location at the PTA; the number of sediment samples to be collected; the frequency of sediment sampling; the appropriateness of analytical techniques, including sample analysis methods; the geologic sampling procedures for sediment collection, including the appropriateness of data evaluation methods; the applicability of a guidance document used by the NRC to evaluate the location and frequency of sediment sampling; the sufficiency of the Davy Crockett DU inventory conducted for the PTA; the lack of evaluation of DU oxides; the lack of transparency in the implementation and reporting of the Licensee’s environmental radiation monitoring results for the licensed DU; the lack of transparency in the NRC’s licensing of Davy Crockett DU at the PTA; and the Licensee’s use of ranges at the PTA for high-explosive fire.

⁴ ADAMS Accession No. ML17177A703.

⁵ ADAMS Accession No. ML17249A091.

⁶ ADAMS Accession No. ML17248A524.

⁷ ADAMS Accession No. ML17249A075.

⁸ ADAMS Accession No. ML17297A372.

⁹ ADAMS Accession No. ML17292A690 (Pkg.).

¹⁰ ADAMS Accession No. ML18011A202 (Pkg.).

¹¹ ADAMS Accession No. ML17346B028.

¹² ADAMS Accession No. ML18022A567.

¹³ Copies of the petition and other publicly available records are available for inspection at the Commission’s Public Document Room, located at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland, and from the ADAMS Electronic Reading Room on the NRC’s Web site at <http://www.nrc.gov/reading-rm/adams.html>. Persons who do not have access to ADAMS should contact the reference staff in the NRC Public Document Room by telephone at 1-800-397-4209 or 301-413-4737, or by email to PDR.Resource@nrc.gov.

¹⁴ ADAMS Accession No. ML16343A164.

¹⁵ ADAMS Accession No. ML16265A231.

In a letter to the Petitioner, dated April 25, 2017,¹⁶ the NRC Staff (Staff) acknowledged receipt of the petition. The petition was assigned to the Office of Nuclear Material Safety and Safeguards (NMSS) for review and appropriate action pursuant to 10 C.F.R. § 2.206. A petition review board (PRB) was formed to evaluate the Petitioner's concerns following the 10 C.F.R. § 2.206 process per Management Directive 8.11, "Review Process for 10 CFR 2.206 Petitions" (MD 8.11).¹⁷ The Petitioner was offered an opportunity to meet with the PRB before the PRB's first meeting, but declined this opportunity.¹⁸

The PRB recommended that the petition be partially accepted for review under the 10 C.F.R. § 2.206 process. The NRC shared its preliminary recommendation¹⁹ with the Petitioner and offered the Petitioner a second opportunity to address the PRB.²⁰ The Petitioner accepted the opportunity and requested a teleconference with the PRB.²¹ The Petitioner met with the PRB via teleconference on October 11, 2017, to clarify the basis for the petition. The transcript²² of this teleconference was treated as a supplement to the petition.

The Petitioner provided additional information on October 12,²³ October 15,²⁴ and November 10, 2017,²⁵ and January 15, 2018,²⁶ to supplement the petition. At the Petitioner's request, a third party provided information on his behalf²⁷ to supplement the petition. The Licensee provided comments and information on the petition by e-mails dated July 31²⁸ and October 13, 2017,²⁹ and in the October 11, 2017, teleconference.

By letter dated November 9, 2017,³⁰ the NRC informed the Petitioner that the following concerns raised in the petition were accepted for review under 10 C.F.R. § 2.206: (1) inappropriate number of sediment samples; (2) inappropriate frequency of sediment sampling; (3) inappropriate and poorly described analytical techniques (sample analysis methods); (4) inappropriate geological

¹⁶ ADAMS Accession No. ML17116A083.

¹⁷ ADAMS Accession No. ML041770328.

¹⁸ ADAMS Accession Nos. ML17159A83, ML17177A703, and ML17177A688.

¹⁹ ADAMS Accession No. ML17279A757.

²⁰ ADAMS Accession No. ML17279A759.

²¹ ADAMS Accession No. ML17279A761.

²² ADAMS Accession No. ML17297A372.

²³ ADAMS Accession No. ML17292A690 (Pkg.).

²⁴ ADAMS Accession No. ML18011A202.

²⁵ ADAMS Accession No. ML17346B028.

²⁶ ADAMS Accession No. ML18022A567.

²⁷ ADAMS Accession No. ML18011A202 (Pkg.).

²⁸ ADAMS Accession No. ML17240A219.

²⁹ ADAMS Accession No. ML17290A307 (Pkg.).

³⁰ ADAMS Accession No. ML17279A300 (Pkg.).

sampling procedures for sediment collection; and (5) inappropriate data evaluation methods (leading to dilution of samples) to determine the presence of depleted uranium outside the ranges (or RCAs) associated with the PTA. In this letter, the NRC also informed the Petitioner that the other concerns raised in the petition were not accepted for review under 10 C.F.R. § 2.206 and stated the basis for this determination. The PRB used the criteria for petition evaluation found in Part III of MD 8.11 to disposition the Petitioner's concerns for acceptance or rejection for review under the 10 C.F.R. § 2.206 process. On November 29, 2017,³¹ the NRC provided notice that the PRB would address the petition pursuant to 10 C.F.R. § 2.206.

By letter dated November 29, 2017,³² the NRC requested that the Licensee provide a voluntary response to the petition. By letters dated December 15, 2017,³³ and January 19, 2018,³⁴ the Licensee provided its voluntary response, and the information provided was considered by the PRB in its evaluation of the petition, as explained in the proposed director's decision.³⁵

The NRC sent a copy of the proposed director's decision to the Petitioner and to the Licensee for comment on February 20, 2018.³⁶ The Petitioner responded with comments on the proposed director's decision on March 13, 2018.³⁷ The Licensee did not provide comments on the proposed director's decision. The Petitioner's comments and the Staff's responses to the comments are included as an attachment to this Director's Decision.

Based on the Staff's evaluation of the Petitioner's March 13, 2018, comments, and the information presented in Section II, Discussion, and Section III, Conclusions, of this Director's Decision, the final Director's Decision has not changed from the proposed director's decision.

The petition and other references related to this petition are available for inspection in the NRC's Public Document Room (PDR), located at O1F21, 11555 Rockville Pike (first floor), Rockville, Maryland 20852. Publicly available documents created or received at the NRC are accessible electronically through ADAMS in the NRC Library at <https://www.nrc.gov/reading-rm/adams.html>. Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS should contact the NRC's PDR

³¹ 82 Fed. Reg. 228 (Nov. 29, 2017), <https://www.gpo.gov/fdsys/pkg/FR-2017-11-29/pdf/2017-25830.pdf>.

³² ADAMS Accession No. ML17297B403.

³³ ADAMS Accession No. ML18009A456.

³⁴ ADAMS Accession No. ML18023A991.

³⁵ ADAMS Accession No. ML17341A126 (Pkg.).

³⁶ ADAMS Accession Nos. ML17340A697 and ML17342A395, respectively.

³⁷ ADAMS Accession No. ML18087A134.

reference staff by telephone at 1-800-397-4209, or 301-415-4737, or by e-mail to pdr.resource@nrc.gov.

II. DISCUSSION

Under 10 C.F.R. § 2.206(b), the Director of the NRC office with responsibility for the subject matter shall either institute the requested proceeding to modify, suspend, or revoke a license, or take any other action as may be proper, or advise the petitioner who made the request, in writing, that no proceeding will be instituted, in whole or in part, with respect to the request and the reasons for the decision.

The Petitioner raised concerns regarding the adequacy of the ERMP for the licensed DU that is located in the RCAs at the PTA (PTA ERMP).³⁸ The PRB analyzed the information provided by the Petitioner in support of his concerns and the results of those analyses are discussed below. After consideration of the petition, including the supplemental information supplied by the Petitioner, the NRC denies the Petitioner's request to modify, suspend, or take other action with respect to Source Materials License No. SUC-1593 under 10 C.F.R. § 2.206. The decision of the NMSS Director is provided with respect to each of these concerns.

Concern 1: The PTA ERMP allows for an inappropriate number of sediment samples in that a single sediment sampling location is inadequate

The Petitioner states that the single sampling point as detailed in the PTA ERMP³⁹ is not sufficient. The Petitioner specifies that "multiple sampling sites should be selected adjacent to each of the four RCA boundaries and each should be in a water way that has had observed intermittent water flow sufficient to carry a sediment load that is deposited at the sample collection site."⁴⁰

In the Staff's safety evaluation report (SER) for Amendment No. 2,⁴¹ the Staff concluded that the site-specific ERMPs were "consistent with the previously approved [Programmatic ERMP] approach for preparation of site-specific environmental monitoring plans," as well as with license conditions in Source Materials License No. SUC-1593, Amendment No. 1.⁴² The approach to select-

³⁸ ADAMS Accession No. ML16265A231.

³⁹ ADAMS Accession No. ML16265A231.

⁴⁰ ADAMS Accession No. ML17177A703.

⁴¹ ADAMS Accession No. ML16343A163.

⁴² ADAMS Accession No. ML16039A234.

ing sediment sampling locations specified in the Programmatic ERMP⁴³ is to sample sediment in waterways that flow from the RCAs. In sites with multiple waterways, multiple sediment sampling locations are used. The PTA has a single sampling site because the Staff considers it a “dry site” with no perennial waterways flowing from the RCAs. The PTA ERMP states that

[D]ue to low rainfall, porous soils, and lava substrates, no perennial surface water bodies are located on, or immediately adjacent to, [PTA]. The closest known surface water body is located 4.5 miles upgradient of [PTA]. There are no perennial streams within 15 miles of [PTA], but there are intermittent streams located north-east of [PTA] and only one intermittent stream, Popoo Gulch, drains the northern portion of [PTA]. Despite occasional flow, water in the intermittent stream channels infiltrates rapidly once precipitation stops and the streams become dry.⁴⁴

In the Staff’s SER for Amendment No. 1,⁴⁵ the NRC approved the Programmatic ERMP. The Staff found that due to the small doses anticipated from environmental transport pathways, a limited environmental monitoring program is justified.

In short, the water in the channel, where the sediment sampling point is identified in the PTA ERMP, flows only occasionally after heavy rainfall events with the water in the intermittent stream’s channel infiltrating rapidly once precipitation stops, resulting in the stream channel becoming dry. The sediment sampling location was selected by the Licensee based on the “surface water hydrology and potential for DU contribution [migration].”⁴⁶ The license requires the Licensee to collect a sediment sample in a designated area in the only intermittent stream downstream from the RCAs. This location and the number of sediment samples were found to be acceptable by the Staff in the SER for Amendment No. 2⁴⁷ because the approach was consistent with the Programmatic ERMP and limited sampling for the PTA is appropriate based upon the small risk posed by the material.

Further, the Staff concluded in its SER for Amendment No. 1⁴⁸ that the dose from airborne contamination is considered to be highly unlikely to exceed a potential 1-mrem/yr dose.⁴⁹ The dose from all other environmental pathways, as

⁴³ ADAMS Accession No. ML16265A218.

⁴⁴ ADAMS Accession No. ML16265A231.

⁴⁵ ADAMS Accession No. ML16039A230.

⁴⁶ ADAMS Accession No. ML16265A231.

⁴⁷ ADAMS Accession No. ML16343A163.

⁴⁸ ADAMS Accession No. ML16039A230.

⁴⁹ See the SER for Amendment 2 (ADAMS Accession No. ML16343A163, pp. 5 and 6 regarding the significance of 1 mrem/yr as related to License Condition 19.

bounded by a resident farmer pathways analysis using RESRAD,⁵⁰ is projected to be less than 4 mrem/yr. Furthermore, actual doses would be further limited because actual exposure durations are expected to be far less than subsistence farming residence times. In addition, in the SER for Amendment No. 1,⁵¹ the Staff independently verified the RESRAD calculations provided by the Licensee and found the use of those scenarios, parameters, and assumptions to be reasonable and appropriate. The results from the RESRAD analysis supported the Staff's decision⁵² to require a limited amount of environmental monitoring outside of the RCA under certain conditions, as required per Section 4.3 of the Programmatic ERMP, and as required by the PTA ERMP. Sampling locations at the site are limited; however, this approach was found to be acceptable by the Staff because it is consistent with the Programmatic ERMP and limited sampling is acceptable based upon the small risk posed by the material. The Staff found the proposed frequencies, analyses, and actions sufficient to ensure DU migration outside of the RCA is adequately monitored while not exposing personnel to undue risk due to accessing unexploded ordnance areas. Accordingly, the Staff concluded in its SER for License Amendment No. 2 that the PTA ERMP is adequate for monitoring for transport of DU from the RCAs.

For the reasons set forth above, the Staff finds that the PTA ERMP does allow for an appropriate number of sediment samples in that a single sediment sampling location is adequate.

Concern 2: The PTA ERMP allows for an inappropriate frequency of sediment samples

The Petitioner states that the Licensee should be required to sample more frequently than quarterly, and that "sampling several times a year is not sufficient."⁵³ The PTA ERMP commits the Licensee to performing sediment sampling on a quarterly basis. This quarterly sampling frequency exceeds the semi-annual sampling frequency for sediment sampling recommended in NUREG-1301, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors,"⁵⁴ April 1991. Because no guidance exists that is specific to DU in the form of spent rounds present in the environment, the Staff used NUREG-1301 to inform its review of the Licensee's

⁵⁰ RESRAD, or RESidual RADioactivity, is a computer code for evaluation of risk posed by radioactively contaminated sites. The NRC has approved RESRAD for dose evaluation by licensees involved in decommissioning, and for Staff to assess waste disposal requests and dose evaluations.

⁵¹ ADAMS Accession No. ML16039A230.

⁵² ADAMS Accession No. ML16343A163.

⁵³ ADAMS Accession No. ML17110A308.

⁵⁴ ADAMS Accession No. ML091050061.

proposed sampling methods and frequency. Although the PTA RCAs do not produce effluents, as do pressurized-water reactors, the guidance in NUREG-1301 is conservative for reviewing the Licensee's proposed sampling methods and frequency because the expected risks from the presence of DU at the PTA are significantly less than those associated with radiological releases from an operating nuclear power plant. The sediment sampling frequency for the PTA is considered by the Staff to be conservative, and therefore adequate because it exceeds the sampling frequency recommended for effluents from pressurized-water reactors, for a site with a much lower potential all-pathway dose.

For the reasons set forth above, the Staff finds that the site-specific ERMP for the PTA is adequate with respect to the frequency of samples taken at the PTA.

Concern 3: The PTA ERMP provides inappropriate and poorly described analytical techniques for the sediment sample analysis methods

The Petitioner states that for the PTA ERMP, the Licensee's "sediment monitoring program is improperly configured."⁵⁵ The Petitioner states that there is an "[i]ncomplete description of laboratory preparation methods for alpha spectrometry" and explains that "[c]hemicals used in preparation, exchange resins, internal standards, concentration methods for uranium, preparation of sample on planchet (electrodeposition or precipitation), counting times, reference standards, etc. must be identified."⁵⁶ Further, the Petitioner states with regard to the PTA sediment monitoring program, that there is an "[i]nadequate description of technique of alpha spectrometry" and inquires, "[w]hat is the sensitivity and what energies will be used for isotope determination? Can other U isotopes be detected (U-236) and transuranics (Pu, Np, Am)?"⁵⁷

In the context of the analytical techniques for the "sediment sampling program for the PTA," the Petitioner states that there are "[i]nadequate analyses for isotopes to identify DU (U-236 and Mo, the alloy material, and transuranics would be of paramount interest)"⁵⁸ and explains that "[t]he samples should be analyzed also by an ICP [inductively coupled-plasma] technique that can identify other isotopes including U-236, and isotopes of Pu, Np and Am. Such would give a specific indication of reprocessed fuel rods. These are important for conclusive

⁵⁵ ADAMS Accession No. ML17177A703.

⁵⁶ ADAMS Accession No. ML17177A703.

⁵⁷ ADAMS Accession No. ML17177A703.

⁵⁸ ADAMS Accession No. ML17177A703.

DU presence.”⁵⁹ Further, the Petitioner disagrees with the NRC statement that “[t]he methods for sample analysis are commonly utilized methods”⁶⁰

As an initial matter, the Staff notes that the Licensee is not required to submit information on laboratory preparation methods beyond the information presented in the Quality Assurance Plan (Annex 19 to the Programmatic ERMP).⁶¹ However, the Staff may ask to review documentation regarding the analysis of sediment samples, such as laboratory procedures and methods, during NRC inspections.

The Staff disagrees with the Petitioner that the proposed analytical methods are not commonly used methods. Alpha spectrometry (U.S. DOE HASL method 300)⁶² and inductively coupled plasma mass spectrometry (ICP-MS) are commonly used methods for sample analysis to determine uranium isotopic activity or mass and have sufficient detection capability to accomplish the stated objectives of the monitoring activity.^{63,64} As described in the license at Annex 19, the “Programmatic Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP)” for the Environmental Radiation Monitoring Program,⁶⁵ ICP-MS will be used to supplement alpha spectrometry in samples in which the alpha spectrometry results indicate a U-238/U-234 ratio above 3.0.

The Petitioner states that the current method of evaluation is not sensitive enough to distinguish DU from natural uranium, and that using a technique that could detect radionuclides that are present in trace quantities in DU, but are not naturally occurring, would provide better evidence of DU transport. Specifically, the Petitioner states that using ICP-MS on each sample, or using it to detect radionuclides other than U-234, U-235, or U-238, is necessary. However, as indicated in Annex 19, the minimum detectable concentration (MDC) for the Licensee’s proposed alpha spectrometry technique is 0.1 picocuries per gram (pCi/g). That value is far below the NRC soil screening values of 13

⁵⁹ ADAMS Accession No. ML17177A703.

⁶⁰ ADAMS Accession No. ML17110A308.

⁶¹ ADAMS Accession No. ML16265A233.

⁶² HASL-300 EML Procedures Manual at <https://www.ornl.gov/ptp/PTP%20Library/library/DOE/eml/hasl300/HASL300TOC.htm>.

⁶³ J. Sabine Becker, *Inductively Coupled Plasma Mass Spectrometry (ICP-MS) and Laser Ablation ICP-MS for Isotopic Analysis of Long-Lived Radionuclides*, 242 *Int’l J. Spectrometry* 183-195 (2005).

⁶⁴ F.P. Carvalho & J.M. Oliveira, *Performance of Alpha Spectrometry in the Analysis of Uranium Isotopes in Environmental and Nuclear Materials*, 281 *J. Radioanal. Nucl. Chem.* 591 (2009). <https://doi.org/10.1007/s10967-009-0046-2>.

⁶⁵ ADAMS Accession No. ML16265A233.

pCi/g, 8.0 pCi/g, and 14 pCi/g, for U-234, U-235, and U-238, respectively.⁶⁶ Those screening values, given in Table H.2 in NUREG-1757, Volume 2, Rev. 1, “Consolidated Decommissioning Guidance,”⁶⁷ are concentrations of individual radionuclides in surficial soil that Staff has determined to be protective of public health and safety.⁶⁸ The Staff determined in its SER for Amendment No. 2⁶⁹ that the two-step analysis method (i.e., using ICP-MS only as a confirmatory technique for samples with a U-238/U-234 ratio above 3.0) is appropriate. Based on the comparison of the MDC of the Licensee’s proposed method to the NRC soil screening values, the Staff continues to find the Licensee’s proposed use of alpha spectrometry to be appropriate.

The Petitioner raises a related point about the effects of the natural variation of the U-238 to U-234 ratio in the environment, on the Licensee’s ability to detect DU. The Petitioner states that “[t]he heterogeneity of the sample ROC [radionuclide of concern] will likely provide dilution effects for analysis and minimize threshold concentrations. This issue has not been addressed by the Army or the analytical laboratory.”⁷⁰ Also, the Petitioner states that “[g]iven the probable dilution factors of sediment sourcing and mixing multiple collected samples, any ratio of U238/234 greater than one should be considered indicative of DU. This was seen in a contractor report (Cabrerria), where soil samples often showed uranium 238/234 increased activity ratios.”⁷¹ As discussed in further detail in the Staff’s disposition of Concern 5, the Staff found that the natural variation in the U-238 to U-234 ratio in the environment did not affect the Staff’s conclusion about the adequacy of the Licensee’s proposed method of evaluation.

The commitments that the Licensee makes in its Programmatic ERMP, which is tied to the license, require the Licensee to periodically review its Programmatic ERMP and each site-specific ERMP for revisions that it believes should be made related to changes in the understanding of risk associated with exposure to DU in the environment; changes in local/regional land use; changes in environmental transport characteristics or environmental conditions that violate the

⁶⁶The NUREG-1757, Volume 2, Rev. 1, Table H.2 values for the individual radionuclides were used instead of the values that account for progeny (i.e., the “+C” values) because the enrichment process that creates DU typically removes most of the progeny with an atomic weight less than U-234 from the DU.

⁶⁷ ADAMS Accession No. ML063000243.

⁶⁸ Soil screening values represent surficial surface soil concentrations of individual radionuclides that would be deemed in compliance with the 25 mrem/yr (0.25 mSv/yr) unrestricted release dose limit in 10 C.F.R. § 20.1402.

⁶⁹ ADAMS Accession No. ML16343A163.

⁷⁰ ADAMS Accession No. ML18017A784.

⁷¹ ADAMS Accession No. ML17177A703.

conservative assumptions of the bounding RESRAD analysis of the Programmatic ERMP in such a way that the RESRAD analysis is no longer bounding; trends in sampling results indicating increased mobilization of DU, but at levels below the bounding RESRAD analysis of the Programmatic ERMP or other regulatory thresholds; and any other new information that indicates a need to adjust the site-specific ERMP. Further, the Programmatic ERMP requires that if the Licensee determines that changing site conditions result in environmental transport or exposure hazards that exceed those used in the bounding RESRAD calculations, the Licensee must notify the NRC license program manager within 30 days. The Staff found the Licensee's commitments reasonable given the expected level of risk.

The Licensee's strategy for routine, as well as periodic, environmental radiation monitoring at the PTA was addressed in its applications for Amendments No. 1 and 2. In its SERs for Amendments No. 1 and 2, the Staff determined that the Programmatic ERMP and PTA ERMP, respectively, would ensure adequate protection of public health and safety. The Staff previously determined in the SER for License Amendment No. 2⁷² that the methods described in the PTA ERMP and UFP-QAPP were sensitive enough. Through inspection, the Staff may inspect the data collected from implementation of the PTA ERMP to verify that the sensitivity remains appropriate.

For the reasons set forth above, the NRC finds that the Licensee's description of its analytical methods in the PTA ERMP is adequate and the Licensee's analytical methods for sediment analysis are appropriate.

Concern 4: The PTA ERMP allows for inappropriate geological procedures for sediment collection

The Petitioner expresses concern about the geological procedures for sediment collection methods, stating, "[w]hat is presented, if given to any reasonable person familiar with geologic sampling procedures, is so egregiously defective and disparate from accepted sampling procedures, it must be deemed fatally flawed."⁷³ The Petitioner asserts that the Licensee's specific sampling techniques, method of sample collection, and training are inadequate.⁷⁴ The Petitioner states "[f]urther, there is no indication that the samplers will have had specific training in the simple and common aspects of sampling. Can they distinguish the difference between a sediment sample and a soil sample or a slump

⁷² ADAMS Accession No. ML16343A163.

⁷³ ADAMS Accession No. ML17110A308.

⁷⁴ ADAMS Accession No. ML17110A308.

deposit?”⁷⁵ The Petitioner specifically notes issues with the composite sample method employed by the Licensee. The Petitioner also states that “organics and water” should be sent for separate analysis and suggests that core sampling would be beneficial.⁷⁶

The types of procedures for sediment collection are identified in each site-specific ERMP and in the Programmatic Quality Assurance Plan for ERMPs, which are tied to the license.⁷⁷ In the SER for Amendment No. 1,⁷⁸ the Staff found that “each ERMP contains prescribed general methods for sample collection and sample analysis” Annex 19, “Programmatic Uniform Federal Policy — Quality Assurance Project Plan (UFP-QAPP),” for the ERMP includes worksheets stating the Licensee’s action levels for sample evaluation and what actions the Licensee is required to take should the sample data exceed these action levels. The license requires the Licensee to use the type of sampling procedures specified in the UFP-QAPP.⁷⁹ During inspections, the Staff will review site-specific procedures, such as sediment sampling procedures, as determined by inspection plans.

The Petitioner expresses concerns about the adequacy of the Licensee’s geological training for individuals tasked with implementing the environmental monitoring program, but does not specify why geological training is necessary to take samples sufficient for the purposes of the PTA ERMP or the Programmatic ERMP. The NRC does not require geological training to implement the PTA ERMP. In its SER for License Amendment No. 1,⁸⁰ the Staff found the Licensee’s commitments regarding training acceptable. In its application for Amendment No. 2, the Licensee made training commitments with regard to implementation of the ERMP in its UFP-QAPP⁸¹ and Programmatic Radiation Safety Plan,⁸² and the Staff found them acceptable as detailed in its associated SER.⁸³ The Licensee did not commit to requiring geological training to implement the PTA ERMP or the Programmatic ERMP.

In its SER for Amendment No. 2,⁸⁴ the Staff concluded that the findings described in the SER support the issuance of a license amendment requiring the use of the site-specific ERMPs and the associated UFP-QAPP applicable to each

⁷⁵ ADAMS Accession No. ML17177A703.

⁷⁶ ADAMS Accession No. ML17177A703.

⁷⁷ ADAMS Accession No. ML16265A221 (Pkg.).

⁷⁸ ADAMS Accession No. ML16039A230.

⁷⁹ ADAMS Accession No. ML16265A233.

⁸⁰ ADAMS Accession No. ML16039A230.

⁸¹ ADAMS Accession No. ML16265A233.

⁸² ADAMS Accession No. ML16004A369.

⁸³ ADAMS Accession No. ML16343A163.

⁸⁴ ADAMS Accession No. ML16343A163.

military installation. The UFP-QAPP addresses the quality assurance, quality control, and additional technical activities that must be implemented to ensure that data collected during ERMP activities at the Davy Crockett installations are of sufficient quality to support the NRC requirements. The Petitioner did not support the claim that specific geological training is necessary to take samples sufficient to meet NRC requirements.

The Petitioner has not provided information to support his assertion that “organics and water” should be sent for separate analysis. The concentrations of the radionuclides of concern are obtained from the analysis of the total sample. The analysis procedure does not require such a separation, nor does the license require the Licensee to separate organics from water for separate analysis before sediment samples are analyzed. With respect to his statement that core sampling would be beneficial, the Petitioner states that core sampling would provide historical information. However, obtaining historical information is not one of the purposes of the PTA ERMP. Scoping⁸⁵ and characterization surveys were performed by the Licensee in the past,⁸⁶ and the Staff, as documented in the SER for Amendment No. 1, found that they were sufficient to determine the extent and depth of Davy Crockett DU at the PTA. In its application for Amendment No. 1, the Licensee reported that the average soil concentrations of uranium inside the RCA are less than the default NRC screening level for license termination. The NRC does not require additional characterization for the PTA.

For the reasons set forth above, the NRC finds that the site-specific ERMP for the PTA is adequate with respect to its description of procedures for sediment collection methods.

Concern 5: The PTA ERMP allows for inappropriate data evaluation methods to determine the presence of DU outside the ranges associated with PTA

The Petitioner states that there is an “[i]nadequate definition of the activity ratios used to define DU presence,” explaining that “[g]iven the probable dilution factors of sediment sourcing and mixing multiple collected samples, any ratio of U238/234 greater than one should be considered indicative of DU. This was seen in a contractor report (Cabrera), where soil samples often showed uranium 238/234 increased activity ratios.”⁸⁷

⁸⁵ ADAMS Accession No. ML092950352.

⁸⁶ USACE, 2007. Archives Search Report on the Use of Cartridge, 20mm Spotting Round M101, Davy Crockett Light Weapon M28, Schofield Barracks and Associated Training Areas, Islands of Oahu and Hawaii. Prepared by USACE, St. Louis District.

⁸⁷ ADAMS Accession No. ML17177A703.

As part of its evaluation of this concern, the Staff requested information⁸⁸ from the Licensee, regarding how it intends to meet the 3-to-1 ratio of U-238 to U-234 in License Condition 17 when compositing sediment samples. In its response to the request,⁸⁹ the Licensee clarified that the “composite” samples were all taken in essentially one location and a provision for taking 10 sub-samples was included to ensure sufficient sample volume was collected. Based on the Licensee’s clarification, the Staff determined that dilution is not a concern as the sub-samples are more representative of a single sample than a “composite” sample.

The Staff verified that the 3-to-1 ratio of U-238 to U-234 is appropriate. DU used for military purposes typically has a U-238 to U-234 activity ratio of approximately 5.5.⁹⁰ If that DU is mixed with natural uranium in the environment, that ratio will be lower because natural uranium has a U-238 to U-234 activity ratio of approximately 1.0.⁹¹ Pursuant to License Condition 17, the Licensee is required to notify the NRC of any uranium detected with a U-238 to U-234 ratio of 3 or more. Based on the assumption that the DU has a U-238 to U-234 ratio of 5.5 and natural uranium has a U-238 to U-234 activity ratio of 1.0, an activity ratio of 3.0 reflects a mixture of approximately 28 percent natural uranium and 72 percent DU (percent by activity).⁹² Background levels of natural uranium in soil from PTA are approximately 0.4 pCi/g.⁹³

A sample with 72 percent depleted uranium (by activity) and 0.4 pCi/g natural uranium would contain approximately 1 pCi/g DU, or approximately 0.15 pCi/g U-234, 0.01 pCi/g U-235, and 0.84 pCi/g U-238, which are well below the NRC soil screening values for decommissioning.⁹⁴ Therefore, the Licensee’s use of the 3.0 activity ratio is acceptable because it would allow the Licensee to identify DU at concentrations below values that NRC finds protective of public health and safety.

⁸⁸ ADAMS Accession No. ML17297B403.

⁸⁹ ADAMS Accession No. ML18009A456.

⁹⁰ IAEA, Depleted Uranium, retrieved at <https://www.iaea.org/topics/spent-fuel-management/depleted-uranium> on January 29, 2018.

⁹¹ U-238 and U-234 in secular equilibrium have an activity ratio of 1.0; however, that ratio is only approximate in the natural environment because of differences in how U-238 and U-234 are retained in rock and soil.

⁹² Because DU has a lower specific activity than natural uranium, that mixture would be 19 percent natural uranium and 81 percent DU by mass.

⁹³ ADAMS Accession No. ML12265A173 (Table 3).

⁹⁴ The NRC soil screening values for decommissioning are: U-234: 1.3E+01 pCi/g; U-235: 8.0E+00 pCi/g, and U-238 1.4E+01 pCi/g. ADAMS Accession No. ML063000243 (Appendix B, Table B.2).

The Petitioner refers to a journal article⁹⁵ that explains that the ratio of U-238 to U-234 in natural uranium can vary because of differences in how U-238 and U-234 are transported in the environment.⁹⁶ However, the background concentrations of natural uranium at PTA are sufficiently low that variation in the U-238 to U-234 ratio of natural uranium at PTA is not expected to be large enough to compromise the Licensee's ability to detect significant migration of DU in soils or sediments. For example, if the U-238 to U-234 ratio of natural uranium in PTA site soil or sediment were only 0.5 instead of 1.0 (a relatively large natural variation), a sample would have a U-238 to U-234 ratio of 3.0 if it had 19 percent natural uranium and 81 percent DU (by activity). Given the natural uranium background concentration of 0.4 pCi/g in PTA soil, that mixture would have a total activity of 2.1 pCi/g, or 1.7 pCi/g DU. As previously indicated, that concentration is well below the NRC soil screening values for uranium isotopes.

The environmental processes that cause variation in the U-238 to U-234 ratio in natural uranium can also affect the U-238 to U-234 ratio in DU exposed to the natural environment. However, the effect of the alpha recoil process described in the reference⁹⁷ supplied by the Petitioner is to allow more U-234 than U-238 to be transported in water. That process would tend to increase the U-238 to U-234 ratio in solid samples of DU (i.e., soil and sediment), making the U-238 to U-234 ratio in those samples greater (i.e., more likely to exceed the threshold value of 3.0). Therefore, the Staff finds that the previous conclusion that the Licensee's proposed method to detect DU is adequate, is not challenged by either the expected natural variation in the U-238 to U-234 ratio in site soil and sediment or consideration of the potential effects of alpha recoil on DU at the site.

For the reasons set forth above, the NRC finds that the Licensee has adequate data evaluation methods to determine the presence of DU at PTA.

III. CONCLUSION

The NRC fully evaluated the Petitioner's concerns and, based on the results of that evaluation, determined that there was no basis for granting the Petitioner's request to modify, suspend, or take other action with respect to Source Materials License No. SUC-1593 under 10 C.F.R. § 2.206. Accordingly, the NRC

⁹⁵ R.L. Fleischer, *Difficulties in Using 234U/238U Values to Detect Enriched or Depleted Uranium*, 94 Health Physics 292-293 (2008).

⁹⁶ ADAMS Accession No. ML17249A091.

⁹⁷ R.L. Fleischer, *Difficulties in Using 234U/238U Values to Detect Enriched or Depleted Uranium*, 94 Health Physics 292-293 (2008).

denies the Petitioner's request to modify, suspend, or take other action with respect to Source Materials License No. SUC-1593. As provided in 10 C.F.R. § 2.206(c), the Staff will file a copy of this final Director's Decision with the Secretary of the Commission for the Commission to review. As provided for by that regulation, the Director's Decision will constitute the final action of the Commission 25 days after the date of the Decision unless the Commission, on its own motion, institutes a review of the Decision within that time.

For the Nuclear Regulatory
Commission

Marc L. Dapas, Director
Office of Nuclear Material Safety
and Safeguards

Dated at Rockville, Maryland,
this 15th day of May 2018.

Attachment:
Petitioner's Comments on the
Proposed Director's Decision and
NRC's Responses

ATTACHMENT

PETITIONER'S COMMENTS ON THE PROPOSED DIRECTOR'S DECISION AND NRC'S RESPONSES

The Petitioner provided comments to the U.S. Nuclear Regulatory Commission (NRC) on the proposed director's decision (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17341A126 (Pkg.)) by electronic mail (e-mail) dated March 13, 2018 (ADAMS Accession No. ML18087A134). In the Petitioner's March 13, 2018 e-mail, the Petitioner notes that he has "rephrased some statements to make it clearer to the review panel members who do not have full familiarity with the issues." For completeness, and where appropriate, the NRC Staff (Staff) provides clarifying remarks on its previous evaluation of the Petitioner's concerns on the Davy Crockett depleted uranium (DU) inventory and the sediment sampling outside the Pohakuloa Training Area (PTA) Radiation Control Areas (RCAs).

The Petitioner's comments do not alter the Staff's overall analyses or conclusions in the director's decision and, therefore, do not require modification to the final director's decision.

Comment 1

The Petitioner asserts that the review process is flawed, as evidenced by (1) the selection and expertise of the reviewing Staff members; (2) an emphasis on administrative review over technical review; and (3) the rejection of new and materially relevant facts presented in the petition and its supplements. With respect to this latter point, the Petitioner provided information on an historic lava flow and referred to a statement made by the Licensee previously indicating that sediment samples will not be collected because no sediment is present at the PTA.

Response 1

The petition was reviewed in accordance with NRC Management Directive (MD) 8.11. MD 8.11 describes the composition and role of the petition review board and the process for reviewing Title 10 of the *Code of Federal Regulations* (10 C.F.R.) 2.206 petitions. A copy of MD 8.11 was provided to the Petitioner on April 25, 2017 (ADAMS Accession No. ML17110A299 (Pkg.)).

The Staff considered all of the information provided by the Petitioner in its review of the petition and its supplements. The Staff notes that at the time the Licensee submitted its initial license application for Source Materials License

No. SUC-1593, the Licensee had not identified an intermittent stream at the PTA. Since that time, as documented in its application for License Amendment No. 2, the Licensee has identified an intermittent stream for sediment sampling outside of the PTA RCA boundaries. On page 2-1 of the Environmental Radiation Monitoring Plan (ERMP) in effect for the PTA (ADAMS Accession No. ML1625A231), the Licensee states:

The sediment sampling location at Pohakuloa TA was selected based on the surface water hydrology and potential for DU contribution and is located as follows:

- ERM-01 — The selected sampling point is located at an intermittent stream at the installation's northern boundary, downstream from the RCAs. ERM-01 is accessible using the Lightning Trail or via Saddle Road.

As explained in Enclosure 1 (ADAMS Accession No. ML17279A082) to the NRC's letter to the Petitioner dated November 9, 2017 (ADAMS Accession No. ML17279A300 (Pkg.)), the Licensee submitted a license amendment application (ADAMS Accession No. ML17158B356) to correct figure sizing/scaling errors in the ERMP annex for the PTA and two other sites. Because the Petitioner's concern regarding the sediment sampling location at the PTA is now under Staff's consideration as part of its review of this license amendment request, the 10 C.F.R. § 2.206 process is not appropriate for addressing that concern. The Staff will inform the Petitioner of the outcome of this licensing review.

Comment 2

The Petitioner asserts that the amount of DU specified in the license for the PTA is grossly underestimated and must be revised. In support of this assertion, the Petitioner states that the component parts of the main warhead show a yellow coating consistent with DU oxide and the existence of firing pistons shows the dummy Davy Crockett warhead (M-390) was fired. The Petitioner states that this concern is now supported with "anecdotal evidence" that the dummy warhead contained DU. The Petitioner provides a link to a blog and web forum as this anecdotal evidence.

Response 2

The Petitioner's comments are directed at a concern that was not accepted for review under the 10 C.F.R. § 2.206 process and is not the subject of this director's decision. The basis for the rejection of this concern under the 10 C.F.R. § 2.206 process is described on pages 5 and 6 of Enclosure 1 to the

proposed director's decision, under the concern identified as "Insufficient Davy Crockett DU Inventory."

The Staff is unable to substantiate the new "anecdotal evidence" referred to in the Petitioner's comment, and is therefore unable to conclude that this anecdotal evidence is evidence that the license underestimates the amount of DU present at the PTA. As explained in Enclosure 1 to the November 9, 2017, letter, the sufficiency of the Davy Crockett DU inventory was addressed in a previous application and safety evaluation report (SER) (Amendment No. 1). The Staff evaluated the Licensee's estimate of the DU inventory and documented its conclusions in the associated SERs for the initial licensing of the ranges with DU at the two military installations located in the Hawaiian Islands, and for Amendment No. 1. As part of its evaluations in both SERs, the Staff considered the information in the Licensee's report entitled "Project Archive Search Report Use of Cartridge, 20mm Spotting M101 Davy Crockett Light Weapon M28 on U.S. Army Installations January 2008 Revised, June 2011." In addition, as part of its review of the initial license application for the PTA (ADAMS Accession No. ML13259A081), the Staff previously reviewed the photographs (ADAMS Accession No. ML09295032) that were referenced in the Petitioner's July 24, 2017, supplement (ADAMS Accession No. ML17249A091), as well as other reference documents provided by the Licensee in its initial ERMP for the PTA (ADAMS Accession No. ML12046A506) that support the conclusion that the yellow residue on other Davy Crockett weapon system components is not DU.

Comment 3

The Petitioner asserts that the Staff improperly introduced health-effect possibility as a reason to accept "corrupt monitoring methodologies." The Petitioner states that, even so, the estimated number of dummy warheads from the piston count should be used in configuring the RESRAD dose. The Petitioner asserts that dose risk to the public should be assessed in a different manner from the resident farmer scenario.

Response 3

The Licensee did not include dummy warheads in its dose assessment because there is no evidence that dummy rounds contain DU at PTA. Source Materials License No. SUC-1593 applies to Davy Crockett M101 spotting rounds, which contain DU. As explained in the director's decision under Concern 4, scoping and characterization surveys were performed by the Licensee in the past. The Staff, as documented in the SER for Amendment No. 1, found that the

Licensee's efforts were sufficient to determine the extent and depth of Davy Crockett DU at the PTA.

The Licensee used the resident farmer exposure scenario for its dose assessment for the PTA. The resident farmer is one who grows her or his own food on the contaminated site and collects her or his own water also from the contaminated site. The Staff considers this scenario to be a bounding scenario for the Davy Crockett M101 spotting rounds at the RCAs. Once the exposure scenario is chosen, the second step in a dose assessment is to predict how the radionuclides will move through the environment to where they could come into contact with humans. The final step in a dose assessment is to then predict what the resulting dose would be. The total lifetime dose received by the individual is calculated from a given amount of a radionuclide ingested or inhaled (measured in curies) multiplied by a dose conversion factor from a related calculation of the dose from external penetrating radiation. Given that calculations for dose assessments are complex, they are best done on a computer.

The Licensee used the computer program or code called RESRAD (short for RESidual RADioactivity) to carry out the three steps described above using the resident farmer scenario. RESRAD is commonly used to make regulatory decisions about residual radioactivity levels at nuclear sites. This code was used by the Licensee, and reviewed by the Staff, to assess radiation exposures of a human receptor located on top of soils contaminated with DU. RESRAD allows users to specify the features of their site and to predict the dose received by an individual at any time over the next 100,000 years. RESRAD is particularly important because it has been accepted for use by the NRC in making regulatory decisions and is freely available to the public.

Comment 4

The Petitioner states that the use of NUREG-1301 is improper because it does not address stream sediment sampling.

Response 4

As stated in the director's decision, while NUREG-1301 is not specific to DU in the form of spent rounds present in the environment, it is conservative for reviewing the Licensee's proposed sampling methods and frequency because the expected risks from the presence of DU at the PTA are significantly less than those associated with radiological releases from an operating nuclear power plant. Also, the fact that this guidance addresses sediment from [the] shoreline of surface water instead of stream sediment does not affect the conservatism of applying the NUREG to environmental sampling at PTA.

Comment 5

The Petitioner challenges the Staff's conclusions that the analytical methods in the PTA ERMP are appropriate and that the laboratory preparation methods are adequately described in the PTA ERMP. The Petitioner states that the analytical method selected, an alpha spectrometer, presumably cannot detect ²³⁵U unless very long counting times are used. The Petitioner states "an overwhelming number of procedural descriptions are provided with the phrase, 'TBD (to be determined)'" in Annex 17 and 19.

Response 5

As stated in the director's decision under Concern 3, the Staff disagrees with the Petitioner that the analytical methods are not commonly used methods. Alpha spectrometry (U.S. DOE HASL method 300) and inductively coupled plasma mass spectrometry (ICP-MS) are commonly used methods for sample analysis to determine uranium isotopic activity or mass and have sufficient detection capability to accomplish the stated objectives of the monitoring activity.

Furthermore, the Petitioner expressed concerns about appropriateness of the analytical methods by raising the issue of the long counting times for U-235. However, as described in Concern 3, the Licensee has not proposed to count U-235, but instead plans to use the U-238 to U-234 ratio, as a surrogate, as required by License Condition 17.

With regard to the analytical procedures being adequately described including the use of the phrase "TBD," as described in the director's decision under Concern 3, the Licensee is not required to submit information on laboratory preparation methods beyond the information presented in the Quality Assurance Plan (Annex 19 to the Programmatic ERMP) (ADAMS Accession No. ML16265A233). Also, the Licensee is not required to submit environmental sampling procedures beyond the information presented in Annex 19 to the Programmatic ERMP. The Licensee has made a commitment in its application for License Amendment No. 1 (ADAMS Accession No. ML16004A369) that:

Each installation-specific ERMP will describe sampling in terms of sampling objectives, sampling protocols, analytical methods, and data quality assurance protocols. These descriptions will conform to commonly accepted practices and reliable sources as described in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (NRC, DOE, EPA, DOD 2000). Acceptable analytical methods include those commonly accepted from reliable references, as presented in MARSSIM, Table 7.2.

The Staff found this approach acceptable. In the SER for License Amendment No. 1 (ADAMS Accession No. ML16039A230), the Staff found that "in ac-

cordance with 10 CFR 40.32(c) . . . that the Army’s proposed equipment and procedures in the programmatic RSP [Radiation Safety Plan] are adequate to protect health and safety and minimize danger to life or property.” Review of specific procedures is covered in the NRC inspection process, not licensing. The Staff may ask to review documentation regarding the analysis of sediment samples, such as laboratory procedures and methods and sampling procedures, during NRC inspections.

Comment 6

The Petitioner asserts that an Oak Ridge report (ADAMS Accession No. ML13101A090) demonstrates that the analytical methods used by the Licensee are improper and that the proposed director’s decision improperly ignores this report.

Response 6

As explained in the director’s decision under Concern 5, as part of the Staff’s review of the Petitioner’s concern regarding composite sample dilution, the Staff requested information (ADAMS Accession No. ML17297B403) from the Licensee, regarding how it intends to meet the 3-to-1 ratio of U-238 to U-234 in License Condition 17 when compositing sediment samples. The Staff referred to the Oak Ridge Report (ADAMS Accession No. ML13101A090) in its request letter (ADAMS Accession No. ML17297B403), stating that

this guidance indicates that a statistically-informed sampling regime should be followed if composite sampling is used over an area (i.e., not just at one sample location). The detailed guidance referenced above recommends (1) retaining sub-samples in case further analysis is needed, (2) establishing an adjusted limit that would trigger analysis of individual subsamples, and (3) using sub-samples of the same volume.

In its response to the request (ADAMS Accession No. ML18009A456), the Licensee clarified that the “composite” samples were all taken in essentially one location and a provision for taking ten sub-samples was included to ensure sufficient sample volume was collected. Based on the Licensee’s clarification, the Staff determined that dilution is not a concern as the sub-samples are more representative of a single sample than a “composite” sample.

Comment 7

The Petitioner states that there are significant barriers to flow from the RCAs

at the PTA to the proposed sample collection site, and that the Staff should have used objective programs to trace out surface flows. The Petitioner states that the Staff should mandate that the sampling location be adjacent to the RCA, “not miles away with an intermittent lava berm.”

Response 7

The Petitioner’s comments are directed at a concern that was not accepted for review under the 10 C.F.R. § 2.206 process and is not the subject of this director’s decision. The basis for the rejection of this concern under the 10 C.F.R. § 2.206 process is described on pages 3 and 4 of Enclosure 1 (ADAMS Accession No. ML17279A082) to the NRC’s letter to the Petitioner dated November 9, 2017 (ADAMS Accession No. ML17279A300 (Pkg.)), under the concern identified as “Inappropriate Sampling Location.” As described in the Staff’s Response 1, above, the Licensee submitted a license amendment application to the NRC to correct figure sizing/scaling errors in the ERMP annex for the PTA and two other sites. Because the Petitioner’s concern regarding the sediment sampling location at the PTA is now under Staff’s consideration as part of its review of this license amendment request, the 2.206 process is not appropriate for addressing that concern. The Staff will inform the Petitioner of the outcome of this licensing review.

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CROW BUTTE RESOURCES, INC.
MATERIALS LICENSE AMENDMENT; MEMORANDUM AND ORDER (Granting in Part and Denying in Part Motion to Deny Migration of Environmental Portion of Contention 2); Docket No. 40-8943-MLA-2 (ASLBP No. 13-926-01-MLA-BD01); LBP-18-2, 87 NRC 21 (2018)

ENTERGY NUCLEAR OPERATIONS, INC.
LICENSE TRANSFER; MEMORANDUM AND ORDER; Docket No. 50-271-LT-2; CLI-18-3, 87 NRC 87 (2018)

ENTERGY NUCLEAR VERMONT YANKEE, LLC
LICENSE TRANSFER; MEMORANDUM AND ORDER; Docket No. 50-271-LT-2; CLI-18-3, 87 NRC 87 (2018)

ENTERGY OPERATIONS, INC.
OPERATING LICENSE RENEWAL; MEMORANDUM AND ORDER (Denying Sierra Club's Petition for Intervention and Request for Hearing); Docket No. 50-458-LR (ASLBP No. 17-956-01-LR-BD01); LBP-18-1, 87 NRC 1 (2018)

EXELON GENERATION COMPANY, LLC
REQUEST FOR ACTION; DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206; Docket Nos. STN 50-456, STN 50-457 (License Nos. NPF-72, NPF-77), STN 50-454, STN 50-455 (License Nos. NPF-37, NPF-66); DD-18-1, 87 NRC 111 (2018)

FLORIDA POWER & LIGHT COMPANY
COMBINED LICENSE; MEMORANDUM AND ORDER; Docket Nos. 52-040-COL, 52-041-COL; CLI-18-1, 87 NRC 39 (2018)

NEXTERA ENERGY SEABROOK, LLC
OPERATING LICENSE AMENDMENT; MEMORANDUM AND ORDER; Docket No. 50-443-LA-2; CLI-18-4, 87 NRC 89 (2018)

NORTHWEST MEDICAL ISOTOPES, LLC
CONSTRUCTION PERMIT; MEMORANDUM AND ORDER; Docket No. 50-609-CP; CLI-18-6, 87 NRC 130 (2018)

TENNESSEE VALLEY AUTHORITY
EARLY SITE PERMIT; MEMORANDUM AND ORDER; Docket No. 52-047-ESP; CLI-18-5, 87 NRC 119 (2018)

UNITECH SERVICES GROUP, INC.
EXPORT LICENSE; MEMORANDUM AND ORDER; Docket No. 11006249 (License No. XW023); CLI-18-2, 87 NRC 78 (2018)

U.S. ARMY INSTALLATION MANAGEMENT COMMAND
REQUEST FOR ACTION; DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206; Docket No. 40-9083 (License No. SUC-1593); DD-18-2, 87 NRC 163 (2018)

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- AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), CLI-08-23, 68 NRC 461, 468 (2008)
license renewal applicant's use of an aging management program identified in the GALL Report constitutes reasonable assurance that it will manage the targeted aging effect during the renewal period; LBP-18-1, 87 NRC 19 n.19 (2018)
- American Nuclear Corp.* (Revision of Orders to Modify Source Materials Licenses), CLI-86-23, 24 NRC 704, 707 (1986)
NRC rules are not subject to collateral attack during adjudicatory proceedings; CLI-18-2, 87 NRC 85 n.32 (2018)
- Andrew Siemaszko*, CLI-06-16, 63 NRC 708, 720 (2006)
board acted within its authority to consider intervention petition as a whole and to reformulate contentions for clarity, succinctness, and efficiency; CLI-18-4, 87 NRC 99 (2018)
- Calvert Cliffs 3 Nuclear Project, LLC, and Unistar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-09-20, 70 NRC 911, 915 n.15 (2009)
50-mile proximity presumption is simply a shortcut for determining standing by implicit approval in reactor license renewal cases; LBP-18-1, 87 NRC 7 n.4 (2018)
- Calvert Cliffs 3 Nuclear Project, LLC, and Unistar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-09-20, 70 NRC 911, 915-16 (2009)
petitioner is presumed to have standing to intervene if petitioner lives within approximately 50 miles of the facility in question; LBP-18-1, 87 NRC 6-7 (2018)
- Calvert Cliffs 3 Nuclear Project, LLC, and Unistar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-09-20, 70 NRC 911, 917 (2009)
fifty-mile proximity presumption is simply a shortcut for determining standing in certain cases; LBP-18-1, 87 NRC 7 n.4 (2018)
proximity presumption rests on the finding that persons living within the roughly 50-mile radius of a facility face a realistic threat of harm if a release from the facility of radioactive material were to occur; LBP-18-1, 87 NRC 7 (2018)
- Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-12-16, 76 NRC 63, 67-69 (2012)
final licensing decisions on spent fuel storage were suspended and related contentions were held in abeyance until the court's remand was appropriately addressed; CLI-18-1, 87 NRC 48-49 (2018)
- Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-14-8, 80 NRC 71, 74-75 (2014)
suspension of final licensing decisions was lifted after Commission approved a generic environmental impact statement and final Continued Storage Rule for spent fuel that addressed the issues in the remand; CLI-18-1, 87 NRC 49 (2018)
- Citizens Against Burlington v. Busey*, 938 F.2d 190, 195 (D.C. Cir.), cert. denied, 502 U.S. 994 (1991)
agencies need only discuss those alternatives that are reasonable and will bring about the ends of the proposed action; LBP-18-1, 87 NRC 13 n.8 (2018)
- Crow Butte Resources, Inc.* (In Situ Leach Facility, Crawford, Nebraska), CLI-15-17, 82 NRC 33, 42 n.58 (2015)
migration tenet allows a previously admitted contention challenging applicant's environmental report to be construed as a challenge to a later-issued Staff environmental review document without requiring the contention's proponent to file a new or amended contention; LBP-18-2, 87 NRC 30 (2018)

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- Crow Butte Resources, Inc.* (Marsland Expansion Area), CLI-14-2, 79 NRC 11, 13-14 (2014)
Commission defers to a board's contention admissibility rulings unless the appeal points to an error of law or abuse of discretion; CLI-18-4, 87 NRC 95 (2018); CLI-18-5, 87 NRC 121 (2018)
- Crow Butte Resources, Inc.* (North Trend Expansion Project), CLI-09-12, 69 NRC 535, 552-53 (2009)
in determining contention admissibility, licensing board has authority to reformulate contentions to eliminate extraneous issues or to consolidate issues for a more efficient proceeding; CLI-18-4, 87 NRC 96 (2018)
- Crow Butte Resources, Inc.* (North Trend Expansion Project), CLI-09-12, 69 NRC 535, 553 (2009)
in appropriate circumstances, a board may define the scope of a contention in light of the foundational support that leads to its admission; LBP-18-2, 87 NRC 36 (2018)
petitioner, not the board, must provide the information required to satisfy contention admissibility standards; CLI-18-4, 87 NRC 96-97 (2018)
- Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Unit 2), CLI-03-14, 58 NRC 207, 219 (2003)
NRC's contention admissibility rule properly reserves its hearing process for genuine, material controversies between knowledgeable litigants; LBP-18-1, 87 NRC 8 (2018)
- Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-01-24, 54 NRC 349, 358 (2001)
contention admissibility standards are strict by design and failure to fulfill any one of the standards renders a contention inadmissible; CLI-18-4, 87 NRC 96 (2018); LBP-18-1, 87 NRC 8 (2018)
- Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-05-24, 62 NRC 551, 559-60 (2005)
Commission considers whether rule waiver proponents have shown or alleged special circumstances that were not contemplated during the rulemaking proceeding; CLI-18-2, 87 NRC 85 n.33 (2018)
- DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 2), CLI-15-18, 82 NRC 135, 141-50 (2015)
board's contention admissibility decision was reversed on the ground that the board improperly provided the nexus between proposed contentions and the application, and itself supplied support for those contentions; CLI-18-4, 87 NRC 98 (2018)
- DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 2), CLI-15-18, 82 NRC 135, 145-46 (2015)
petitioner, not the board, must provide the information required to satisfy contention admissibility standards; CLI-18-4, 87 NRC 96-97 (2018)
- DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 2), CLI-15-18, 82 NRC 135, 146 (2015)
challenged material must bear a sufficient nexus to the facts and arguments in the initial petition and answers to warrant being included in the reply; LBP-18-1, 87 NRC 6 (2018)
- DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-14-7, 80 NRC 1, 10 (2014)
request to suspend reactor licensing decisions pending resolution of a petition for rulemaking concerning environmental impacts of the expedited transfer of spent fuel from the spent fuel pool to dry cask storage was denied; CLI-18-1, 87 NRC 48 n.38 (2018)
- DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-1, 81 NRC 1, 7 (2015)
failure to file contentions based on applicant's environmental report could result in dismissal of the contention as impermissibly late; CLI-18-5, 87 NRC 123 (2018)
- DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-4, 81 NRC 221, 240, 242 (2015)
Commission is not required under the Atomic Energy Act to make predictive findings regarding technical feasibility of spent fuel disposal as part of its reactor licensing decisions; CLI-18-1, 87 NRC 49 n.42 (2018)
- Duke Energy Carolinas, LLC* (William States Lee III Nuclear Station, Units 1 and 2), CLI-16-19, 84 NRC 180, 198 n.111 (2016)
exemption from certain requirements pertaining to material control and accounting for special nuclear material, such that the same requirements apply to both Part 52 and Part 50 licenses, was granted; CLI-18-1, 87 NRC 55 n.82 (2018)
- Duke Energy Carolinas, LLC* (William States Lee III Nuclear Station, Units 1 and 2), CLI-16-19, 84 NRC 180, 199 (2016)
NRC Staff designated the Levy County combined license application as a "reference" application for five common departures and exemptions; CLI-18-1, 87 NRC 54 n.77 (2018)

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- Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-17, 56 NRC 1, 7-8 (2002)
it is enough for a petitioner to identify, in a contention of omission, information that is claimed to be missing and demonstrate why that information is required; CLI-18-5, 87 NRC 122 n.12 (2018)
- Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-28, 56 NRC 373, 379 (2002)
contentions of omission generally need not provide the same level of factual support required for a contention challenging the adequacy of information in an application; CLI-18-5, 87 NRC 122 n.12 (2018)
it is enough for petitioner to identify, in a contention of omission, information that is claimed to be missing and demonstrate why that information is required; CLI-18-5, 87 NRC 122 n.12 (2018)
- Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-28, 56 NRC 373, 382 (2002)
if a contention is one of omission challenging an absence of information in an environmental report, and new licensing documents are provided that supply such information, the previous contention loses its efficacy and the adequacy of the new information should become the focus of concern in that new claims must be raised in a new or amended contention; LBP-18-2, 87 NRC 31 (2018)
- Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-28, 56 NRC 373, 382-83 (2002)
contentions of omission claim an omission of necessary information, and contentions of adequacy challenge substantively and specifically how particular information has been discussed in a license application; CLI-18-5, 87 NRC 122 (2018); LBP-18-2, 87 NRC 31 (2018)
in applying the migration tenet, consideration must be given to the case law that distinguishes between a contention of omission and a contention of adequacy; LBP-18-2, 87 NRC 31 (2018)
- Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-28, 56 NRC 373, 382-84 (2002)
identification of an omission in the environmental report and demonstration that spent fuel pool accident consequences must be either considered or shown to be remote and speculative to satisfy NRC's obligations under NEPA is sufficient for an admissible contention of omission; CLI-18-5, 87 NRC 126 (2018)
- Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-28, 56 NRC 373, 383 (2002)
significant change in the nature of the purported NEPA imperfection, from one focusing on comprehensive information omission to one centered on a deficient analysis of subsequently supplied information, warrants issue modification by the complaining party; LBP-18-2, 87 NRC 31 (2018)
subsequent challenge to the adequacy of whatever analysis is supplied in a combined license application would need to meet the requirements for a new contention; CLI-18-5, 87 NRC 125 (2018)
- Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 336 (1999)
applicants frequently incorporate by reference certain material in NRC proceedings; CLI-18-2, 87 NRC 82-83 n.22 (2018)
- Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 341-42 (1999)
contention that fails to directly controvert the license application is subject to dismissal; LBP-18-1, 87 NRC 17 (2018)
- Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 345 (1999)
rule prohibiting litigation of matters that are or are about to become subject to rulemaking does not apply; CLI-18-4, 87 NRC 104 (2018)
- Duke Energy Florida, LLC* (Levy County Nuclear Power Plant, Units 1 and 2), CLI-16-16, 84 NRC 66, 79-82 (2016)
requested departures from the certified design and their accompanying exemptions were approved in the decision authorizing issuance of the combined licenses; CLI-18-1, 87 NRC 55 n.79 (2018)
- Entergy Nuclear Operations, Inc.* (Indian Point, Unit 2), CLI-16-5, 83 NRC 131, 136 (2016)
failure to fulfill any of the contention admissibility requirements of 10 C.F.R. 2.309(f)(1) renders a contention inadmissible; LBP-18-1, 87 NRC 8 (2018)

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- Exelon Generation Co.* (Early Site Permit for Clinton ESP Site), CLI-05-17, 62 NRC 5, 34-36 (2005)
Commission does not review construction permit application de novo, but rather determines whether NRC Staff's review was sufficient to support the required findings; CLI-18-6, 87 NRC 136 (2018)
- Fansteel, Inc.* (Muskogee, Oklahoma Site), CLI-03-13, 58 NRC 195, 204 (2003)
petitioner has an obligation not just to refer generally to voluminous documents, but to provide analysis and supporting evidence as to why particular sections of those documents provide a basis for a contention; LBP-18-2, 87 NRC 33-34 (2018)
- FirstEnergy Nuclear Operating Co.* (Davis-Besse Nuclear Power Station, Unit 1), CLI-12-8, 75 NRC 393, 396 (2012)
NRC's contention admissibility rule properly reserves its hearing process for genuine, material controversies between knowledgeable litigants; LBP-18-1, 87 NRC 8 (2018)
- FirstEnergy Nuclear Operating Co.* (Davis-Besse Nuclear Power Station, Unit 1), CLI-12-8, 75 NRC 393, 400 (2012)
at contention admission stage, petitioner bears the burden of providing some minimal factual support or expert opinion sufficient to demonstrate a genuine dispute as to whether an alternative energy source or a combination of sources can meet that standard; LBP-18-1, 87 NRC 13 (2018)
in reactor license renewal applications, a reasonable alternative energy source should be commercially viable and technically capable of producing the required baseload power in the region of interest by the expiration date of the license; LBP-18-1, 87 NRC 13 (2018)
- FirstEnergy Nuclear Operating Co.* (Davis-Besse Nuclear Power Station, Unit 1), CLI-12-8, 75 NRC 393, 401 (2012)
for an alternative energy source to be deemed reasonable, it must be a current or impending reality in the region of interest; LBP-18-1, 87 NRC 14-15 (2018)
- FirstEnergy Nuclear Operating Co.* (Davis-Besse Nuclear Power Station, Unit 1), CLI-12-8, 75 NRC 393, 402 (2012)
mere potential for or theoretical capacity of renewable energy and energy efficiency in lieu of nuclear power is insufficient to show their commercial viability as a source of baseload power in the region of interest by the expiration date of the license; LBP-18-1, 87 NRC 14 (2018)
- FirstEnergy Nuclear Operating Co.* (Davis-Besse Nuclear Power Station, Unit 1), CLI-12-8, 75 NRC 393, 404 n.67 (2012)
neither the Commission nor the board is obliged to look through lengthy documents for information on which a litigant relies; LBP-18-2, 87 NRC 33 (2018)
- Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-15-25, 82 NRC 389, 394 (2015)
contemporaneous judicial concepts of standing require petitioner to allege an injury in fact that is fairly traceable to the challenged action and is likely to be redressed by a favorable decision; LBP-18-1, 87 NRC 6 (2018)
- Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-15-25, 82 NRC 389, 397 (2015)
licensing board may consider the readily apparent legal implications of a pro se petitioner's arguments, even if not expressly stated in the petition; CLI-18-4, 87 NRC 96 (2018)
- Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-15-25, 82 NRC 389, 397 (2015)
licensing boards are allowed some latitude with respect to pro se petitioners; CLI-18-4, 87 NRC 96 (2018)
pro se petitioners are not held to the same standards as parties represented by counsel; CLI-18-4, 87 NRC 96 (2018)
- Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-15-25, 82 NRC 389, 401 (2015)
in determining contention admissibility, licensing board has authority to reformulate contentions to eliminate extraneous issues or to consolidate issues for a more efficient proceeding; CLI-18-4, 87 NRC 96 (2018)

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- Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), LBP-01-6, 53 NRC 138, 150, *aff'd on other grounds*, CLI-01-17, 54 NRC 3 (2001)
proximity presumption was applied in a reactor license renewal proceeding; LBP-18-1, 87 NRC 7 (2018)
- Gulf States Utilities Co.* (River Bend Station, Units 1 and 2), ALAB-444, 6 NRC 760, 773 (1977)
challenge to testing and analysis protocols for core sampling represents a particularized challenge to applicant's license amendment request; CLI-18-4, 87 NRC 106 (2018)
- Hydro Resources, Inc.* (P.O. Box 15910, Rio Rancho, NM 87174), CLI-01-4, 53 NRC 31, 55 (2001)
agencies need only discuss those alternatives that are reasonable and will bring about the ends of the proposed action; LBP-18-1, 87 NRC 13 n.8 (2018)
- Louisiana Energy Services, L.P.* (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 84 (1998)
contention challenging applicant's environmental report generally may be viewed by a board as a challenge to NRC Staff's subsequently issued environmental review documents; LBP-18-2, 87 NRC 30 (2018)
- New York v. NRC*, 681 F.3d 471, 482 (D.C. Cir. 2012)
NRC is required under NEPA to address the environmental consequences of spent fuel pool accidents unless they could be found to be remote and speculative; CLI-18-5, 87 NRC 123 n.19 (2018)
- NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 1), CLI-12-5, 75 NRC 301, 323 (2012)
contentions admitted for litigation must point to a deficiency in the application, and not merely suggest other ways an analysis could have been done; CLI-18-4, 87 NRC 100 (2018)
- NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 1), CLI-12-5, 75 NRC 301, 338 (2012)
NEPA requires an environmental report to address the environmental impacts of the proposed action and compare them to impacts of reasonable alternatives to the proposed action; LBP-18-1, 87 NRC 13 (2018)
- NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 1), CLI-12-5, 75 NRC 301, 342 (2012)
in reactor license renewal applications, a reasonable alternative energy source should be commercially viable and technically capable of producing the required baseload power in the region of interest by the expiration date of the license; LBP-18-1, 87 NRC 13 (2018)
- NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 1), LBP-17-7, 86 NRC 59, 91 (2017)
board may not provide new or missing information to render a contention admissible; CLI-18-4, 87 NRC 98 (2018)
- NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 1), LBP-17-7, 86 NRC 59, 92 (2017)
board is allowed it to reasonably interpret a pro se petitioner's arguments; CLI-18-4, 87 NRC 98-99 (2018)
board may consider readily apparent legal implications of a pro se petitioner's arguments, even if not expressly stated in the petition; CLI-18-4, 87 NRC 96 (2018)
- NRDC v. Morton*, 458 F.2d 827, 837, 838 (D.C. Cir. 1972)
NEPA requires an environmental report to address the environmental impacts of the proposed action and compare them to impacts of reasonable alternatives to the proposed action; LBP-18-1, 87 NRC 13 (2018)
- NRDC v. Morton*, 458 F.2d 827, 837-38 (D.C. Cir. 1972)
NEPA does not require consideration of alternatives that are only remote and speculative possibilities; LBP-18-1, 87 NRC 13 n.8 (2018)
- NRDC v. NRC*, 879 F.3d 1202, 1209 (D.C. Cir. 2018)
boards will not hunt for evidence that the draft environmental assessment is not substantially similar to the environmental report, plumb the record for arguments that there is a reasonable basis to conclude that the new information adequately addresses the deficits, or generally do counsels' work for them; LBP-18-2, 87 NRC 34 (2018)
- Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-11-11, 74 NRC 427, 442 n.81 (2011)
contention admissibility standard does not contemplate a determination of the merits of a proffered contention; CLI-18-4, 87 NRC 102 (2018)

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- Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-16-9, 83 NRC 472, 482 (2016)
Commission defers to a board's contention admissibility rulings unless the appeal points to an error of law or abuse of discretion; CLI-18-4, 87 NRC 95 (2018); CLI-18-5, 87 NRC 121 (2018)
- Potomac Electric Power Co.* (Douglas Point Nuclear Generating Station, Units 1 and 2), ALAB-218, 8 AEC 79, 85 (1974)
licensing board should not accept in individual license proceedings contentions that are or are about to become the subject of general rulemaking by the Commission; CLI-18-4, 87 NRC 105 (2018)
- Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-99-10, 49 NRC 318, 323 (1999)
petitioner seeking to establish representational standing must satisfy four requirements; LBP-18-1, 87 NRC 7 (2018)
- Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-01-23, 54 NRC 163, 172 n.3 (2001)
migration tenet may not be used to change the basic form of a contention from a contention of omission to one of adequacy; LBP-18-2, 87 NRC 31 (2018)
- Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-02-2, 55 NRC 20, 30 (2002)
significant change in the nature of the purported NEPA imperfection, from one focusing on comprehensive information omission to one centered on a deficient analysis of subsequently supplied information, warrants issue modification by the complaining party; LBP-18-2, 87 NRC 31 (2018)
- Progress Energy Carolinas, Inc.* (Shearon Harris Nuclear Power Plant, Units 2 and 3), CLI-10-9, 71 NRC 245, 270 (2010)
contentions of omission claim an omission of necessary information, and contentions of adequacy challenge substantively and specifically how particular information has been discussed in a license application; CLI-18-5, 87 NRC 122 (2018)
- Progress Energy Florida, Inc.* (Levy County Nuclear Power Plant, Units 1 and 2), CLI-10-2, 71 NRC 27, 36-37 & n.44 (2010)
contentions of omission claim an omission of necessary information, and contentions of adequacy challenge substantively and specifically how particular information has been discussed in a license application; CLI-18-5, 87 NRC 122 (2018)
- SHINE Medical Technologies, Inc.* (Medical Radioisotope Production Facility), CLI-16-4, 83 NRC 58, 64 (2016)
Commission does not review construction permit application de novo, but rather determines whether NRC Staff's review was sufficient to support the required findings; CLI-18-6, 87 NRC 136 (2018)
- South Carolina Electric & Gas Co.* (Virgil C. Summer Nuclear Station, Units 2 and 3), CLI-10-1, 71 NRC 1, 7 (2010)
contention admissibility standards are strict by design and failure to fulfill any one of the standards renders a contention inadmissible; CLI-18-4, 87 NRC 96 (2018)
- Southern Nuclear Operating Co.* (Early Site Permit for Vogtle ESP Site), LBP-08-2, 67 NRC 54, 63-64 (2008)
contention migration is appropriate as long as the draft environmental assessment's analysis or discussion at issue is essentially *in para materia* with the environmental report's analysis or discussion that is the focus of the contention; LBP-18-2, 87 NRC 30 (2018)
- Southern Nuclear Operating Co.* (Vogtle Electric Generating Plant, Units 3 and 4), CLI-12-2, 75 NRC 63, 68 (2012)
all safety and environmental matters relevant to a combined license application, except those resolved in the contested proceeding, are subject to review in the uncontested proceeding; CLI-18-1, 87 NRC 50 (2018)
- Southern Nuclear Operating Co.* (Vogtle Electric Generating Plant, Units 3 and 4), CLI-12-2, 75 NRC 63, 74 (2012)
combined license application is not reviewed de novo in the mandatory hearing, but rather, the inquiry is whether NRC Staff's review was sufficient to support its findings; CLI-18-1, 87 NRC 45 (2018)

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- Statement of Policy on Conduct of Licensing Proceedings*, CLI-81-8, 13 NRC 452, 454 (1981)
fairness to all involved in NRC's adjudicatory procedures requires that every participant fulfill the obligations imposed by and in accordance with applicable law and Commission regulations;
CLI-18-4, 87 NRC 96 n.49 (2018)
- Strata Energy, Inc.* (Ross In Situ Recovery Uranium Project), LBP-13-10, 78 NRC 117, 132 n.7 (2013)
issuance of NRC Staff's safety evaluation report does not trigger the migration tenet; LBP-18-2, 87 NRC 36 n.7 (2018)
- Strata Energy, Inc.* (Ross In Situ Recovery Uranium Project), LBP-13-10, 78 NRC 117, 133 (2013), *petition for review denied*, CLI-16-13, 83 NRC at 601, *petition for review denied sub nom. NRDC v. NRC*, 879 F.3d 1202, 1206-07 (D.C. Cir. 2018)
boards need only permit migration of an admitted contention where information in NRC Staff's environmental review document is sufficiently similar to material in applicant's environmental report; LBP-18-2, 87 NRC 30 (2018)
- Strata Energy, Inc.* (Ross In Situ Recovery Uranium Project), LBP-13-10, 78 NRC 117, 134 (2013)
petitioner must provide appropriate affidavits, declarations, or other information explaining to the board why the subsequent licensing documents contain new information that is materially different such that the petitioner could not have proffered the contention earlier in the proceeding; LBP-18-2, 87 NRC 35 (2018)
- Strata Energy, Inc.* (Ross In Situ Recovery Uranium Project), LBP-13-10, 78 NRC 117, 138 (2013)
in appropriate circumstances, a board may define the scope of a contention in light of the foundational support that leads to its admission; LBP-18-2, 87 NRC 36 (2018)
- Strata Energy, Inc.* (Ross In Situ Recovery Uranium Project), LBP-13-10, 78 NRC 117, 143 n.15 (2013)
contention's sponsor may choose not to make any submission regarding an admitted ER-based environmental contention that it believes will properly migrate and can simply await an applicant or NRC Staff filing challenging the contention's continued viability in light of the Staff's environmental document; LBP-18-2, 87 NRC 30 (2018)
failure to submit a contention migration declaration is not, in and of itself, a reason for a board to refuse to allow the environmental portion of a contention to migrate as a challenge to NRC Staff's draft environmental assessment; LBP-18-2, 87 NRC 31 (2018)
proponent of a contention is not required to resubmit the contention if it maintains that the contention will properly migrate; LBP-18-2, 87 NRC 30 (2018)
- Strata Energy, Inc.* (Ross In Situ Uranium Recovery Project), CLI-16-13, 83 NRC 566, 570 n.17 (2016)
boards need only permit migration of an admitted contention where information in NRC Staff's environmental review document is sufficiently similar to material in applicant's environmental report; LBP-18-2, 87 NRC 30 (2018)
- Tennessee Valley Authority* (Browns Ferry Nuclear Plant, Units 1, 2, and 3), CLI-17-5, 85 NRC 87, 91 (2017)
Commission defers to a board's contention admissibility rulings unless the appeal points to an error of law or abuse of discretion; CLI-18-4, 87 NRC 95 (2018)
- Tennessee Valley Authority* (Browns Ferry Nuclear Plant, Units 1, 2, and 3), CLI-17-5, 85 NRC 87, 92, 94 (2017)
board's rejection of a hearing request in which requester sought a hearing on an individual licensing action on the ground that NRC Staff had constructively denied its pending rulemaking petition was affirmed; CLI-18-4, 87 NRC 105 (2018)
- Transnuclear* (Export of 93.3% Enriched Uranium), CLI-00-16, 52 NRC 68, 72 (2000)
where petitioners have already submitted detailed information as to the basis for their position, the Commission does not believe a hearing will result in significant new information that is not already available to and considered by the Commission in making the requisite statutory determinations; CLI-18-2, 87 NRC 82 n.21 (2018)
- Union Electric Co. d/b/a Ameren Missouri* (Callaway Plant, Unit 2), CLI-11-5, 74 NRC 141, 150 n.19, 175-76 (2011)
request for safety analysis of Fukushima accident based on the NRC's plans for a short-term and long-term lessons-learned review was granted and portions of a petition relating to pending design certification applications, including the AP1000 amendment, were referred to NRC Staff as comments on the design certification rulemakings; CLI-18-1, 87 NRC 47 (2018)

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- U.S. Department of Energy* (Export of 93.20% Enriched Uranium), CLI-16-15, 84 NRC 53, 56 (2016)
public participation in export licensing proceedings is allowed only when such participation will be in the public interest and will assist the Commission in making the statutory determinations required by the Atomic Energy Act; CLI-18-2, 87 NRC 80 (2018)
- U.S. Department of Energy* (Export of 93.20% Enriched Uranium), CLI-16-15, 84 NRC 53, 58 (2016)
petitioner must show how a hearing on an export license would bring new information to light; CLI-18-2, 87 NRC 82 n.21 (2018)
- U.S. Department of Energy* (Plutonium Export License), CLI-04-17, 59 NRC 357, 367 (2004)
persons without an affected interest in an export license proceeding are not as likely as persons with an affected interest to contribute to NRC decisionmaking by showing that a hearing would be in the public interest and assisting in making the statutory determinations; CLI-18-2, 87 NRC 81 (2018)
- U.S. Department of Energy* (Plutonium Export License), CLI-04-17, 59 NRC 357, 369 (2004)
where petitioners have already submitted detailed information as to the basis for their position, the Commission does not believe a hearing will result in significant new information that is not already available to and considered by the Commission in making the requisite statutory determinations; CLI-18-2, 87 NRC 82 n.21 (2018)
- USEC Inc.* (American Centrifuge Plant), CLI-06-10, 63 NRC 451, 458 (2006)
arguments raised for the first time on appeal will not be considered; CLI-18-4, 87 NRC 100 n.70 (2018)
- USEC Inc.* (American Centrifuge Plant), CLI-06-10, 63 NRC 451, 477 (2006)
contention admissibility standards require more than identification of a desired result; CLI-18-4, 87 NRC 100-01 (2018)
- Virginia Electric and Power Co.* (North Anna Power Station, Units 1 and 2), LBP-84-40A, 20 NRC 1195, 1199 (1984)
board acted within its authority to consider intervention petition as a whole and to reformulate contentions for clarity, succinctness, and efficiency; CLI-18-4, 87 NRC 99 (2018)
- Yankee Atomic Electric Co.* (Yankee Nuclear Power Station), LBP-96-2, 43 NRC 61, 90 (1996), *rev'd in part on other grounds*, CLI-96-7, 43 NRC 235 (1996)
document put forth by an intervenor as the basis for a contention is subject to scrutiny both for what it does and does not show; CLI-18-4, 87 NRC 107 n.131 (2018)

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- 10 C.F.R. 1.13
Advisory Committee on Reactor Safeguards is a committee of technical experts who provide the Commission with an independent assessment of the safety aspects of an application; CLI-18-1, 87 NRC 44 (2018)
- 10 C.F.R. 2.204
demand for information is a formal request made to a licensee or applicant to obtain information for the NRC Staff to determine whether an order should be issued to modify, suspend, or revoke the license, or whether to take other enforcement action; DD-18-1, 87 NRC 116 (2018)
issuance of a demand for information was not necessary to evaluate the safety-conscious work environment concerns expressed in the 2.206 petition; DD-18-1, 87 NRC 116 (2018)
- 10 C.F.R. 2.206
petition that does not request enforcement action does not meet the criteria for acceptance for review; DD-18-1, 87 NRC 114, 116 (2018)
petitioner's request that NRC reconsider issuance of amendment to source materials license, citing deficiencies in environmental radiation monitoring plan for depleted uranium, is denied; DD-18-2, 87 NRC 165-87 (2018)
request for action on deficiencies in the analysis of record for the main steam isolation valve room pressurization following a high-energy line break is granted in part; DD-18-1, 87 NRC 112-18 (2018)
- 10 C.F.R. 2.206(b)
director of NRC office shall either institute the requested proceeding, take any other action as may be proper, or advise petitioner in writing that no proceeding will be instituted; DD-18-2, 87 NRC 169 (2018)
- 10 C.F.R. Part 2, Subpart C
intervention standards in this subpart apply only to domestic licensing proceedings; CLI-18-2, 87 NRC 80 (2018)
- 10 C.F.R. 2.309(a)
petition to intervene will be granted if petitioner demonstrates standing and raises at least one admissible contention that meets the six-factor test; CLI-18-5, 87 NRC 122 (2018)
- 10 C.F.R. 2.309(a)-(d)
intervention petitioner in a licensing proceeding must demonstrate standing and proffer a contention that satisfies this agency's contention admissibility criteria; LBP-18-1, 87 NRC 6 (2018)
intervenor seeking to admit a new or amended contention must base its filing on information that is materially different from that which was previously available; LBP-18-2, 87 NRC 34 (2018)
- 10 C.F.R. 2.309(c)(1)
subsequent challenge to the adequacy of whatever analysis is supplied in a combined license application would need to meet the requirements for a new contention; CLI-18-5, 87 NRC 125 (2018)
- 10 C.F.R. 2.309(d)(2)
licensing board has an independent obligation to determine whether a petitioner satisfies standing requirements, even if there is no challenge; LBP-18-1, 87 NRC 6 (2018)
- 10 C.F.R. 2.309(f)
intervention petitioner in a licensing proceeding must demonstrate standing and proffer a contention that satisfies this agency's admissibility criteria; LBP-18-1, 87 NRC 6 (2018)

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- 10 C.F.R. 2.309(f)(1)
contentions are admissible if they satisfy all six criteria; CLI-18-4, 87 NRC 95-96 (2018); LBP-18-1, 87 NRC 8 (2018)
petition to intervene will be granted if petitioner demonstrates standing and raises at least one admissible contention that meets the six-factor test; CLI-18-5, 87 NRC 122 (2018)
request for hearing must set forth with particularity the contentions sought to be raised; CLI-18-4, 87 NRC 95 (2018)
- 10 C.F.R. 2.309(f)(1)(v)
contention alleging that the environmental report's analysis of wind, solar, and energy efficiency in combination is inadequate fails to lay an adequate factual foundation; LBP-18-1, 87 NRC 10 (2018)
petitioner in license renewal proceeding must provide alleged facts or expert opinion supporting the proposition that a combination of wind, solar, and energy efficiency would be commercially viable and technically capable of producing baseload power in the region of interest by the expiration date of the license; LBP-18-1, 87 NRC 13, 14-15 (2018)
reliance solely on an Information Notice to support a contention is insufficient; LBP-18-1, 87 NRC 19 n.19 (2018)
- 10 C.F.R. 2.309(f)(1)(vi)
contention alleging that license renewal application does not undertake an adequate aging management review of the concrete on the containment vessel fails to raise a genuine dispute; LBP-18-1, 87 NRC 16 (2018)
contention alleging that the environmental report failed to consider renewable energy and energy efficiency as alternatives to renewing an operating license fails to raise a genuine dispute; LBP-18-1, 87 NRC 10 (2018)
contention that applicant's environmental report does not properly and adequately state a purpose and need for relicensing fails to raise a genuine dispute; LBP-18-1, 87 NRC 8-9 (2018)
contention that license renewal application is deficient for failing to discuss the ASTM standards does not raise a genuine dispute on an issue of material law or fact regarding the adequacy of the LRA's treatment of alkali-silica reaction-induced degradation in licensee's drywell; LBP-18-1, 87 NRC 18-19 (2018)
petitioner's arguments fail to raise a genuine dispute on a material issue of law or fact regarding the license renewal application's discussion of alkali-silica reaction; LBP-18-1, 87 NRC 16 (2018)
- 10 C.F.R. 2.309(f)(2)
contentions must be raised at the earliest possible opportunity; CLI-18-5, 87 NRC 122-23 (2018)
- 10 C.F.R. 2.311(d)(1)
appeal as of right on the question whether a petition to intervene should have been wholly denied is allowed; CLI-18-4, 87 NRC 95 (2018)
party other than petitioner has a right to appeal on the question whether a petition to intervene should have been wholly denied; CLI-18-5, 87 NRC 121 (2018)
- 10 C.F.R. 2.315(c)
city was granted right to participate as an interested local government after admission of its contentions was denied; CLI-18-1, 87 NRC 49 (2018)
- 10 C.F.R. 2.323(b)
motion to deny contention migration must state with particularity the grounds upon which relief is sought and be accompanied by any affidavits or other evidence relied on; LBP-18-2, 87 NRC 30 (2018)
- 10 C.F.R. 2.325
movant challenging contention migration has the burden of proof to show that it should not be permitted; LBP-18-2, 87 NRC 30 (2018)
proponent of a motion has the burden of proof; LBP-18-2, 87 NRC 30 (2018)
- 10 C.F.R. 2.341(b)
city denied party status may appeal at the end of the proceeding; CLI-18-1, 87 NRC 49 n.43 (2018)
- 10 C.F.R. Part 20
proposed design of medical radioisotope production facility incorporates safety-related and non-safety-related structures, systems, and components that are further categorized based on whether they would be designed to meet the performance requirements for accidents or for normal operations; CLI-18-6, 87 NRC 142 (2018)

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- 10 C.F.R. 20.1301(e), 20.1302
design of the liquid waste management system must satisfy the requirements of these regulations;
CLI-18-1, 87 NRC 61-62 n.130 (2018)
- 10 C.F.R. 20.2002
applicant may seek approval of a waste disposal procedure not otherwise authorized by the regulations;
CLI-18-1, 87 NRC 60-61 (2018)
applicant seeking approval of an alternative waste disposal procedure must include a description of the
waste, proposed manner and conditions of disposal, analysis of the nature of the environment, nature
and location of other potentially affected facilities, and analyses and procedures to ensure that doses are
maintained as low as is reasonably achievable and within the dose limits of Part 20; CLI-18-1, 87 NRC
61 n.122 (2018)
approach to disposal of liquid radioactive waste must meet the requirements of this section; CLI-18-1, 87
NRC 61 (2018)
NRC Staff typically approves requests that will result in a dose to a member of the public that is no
more than a few millirem/year; CLI-18-1, 87 NRC 61 (2018)
- 10 C.F.R. Part 30
medical radioisotope production facility will need to apply for and obtain a byproduct material license to
process and ship molybdenum-99; CLI-18-6, 87 NRC 141 n.62 (2018)
- 10 C.F.R. 40.31(f)
migration of contention that applicant fails to include adequate hydrogeological information to demonstrate
ability to contain fluid migration is decided; LBP-18-2, 87 NRC 28, 37 n.8 (2018)
- 10 C.F.R. Part 40, Appendix A, Criteria 4(e) and 5G(2)
migration of contention that applicant fails to include adequate hydrogeological information to demonstrate
ability to contain fluid migration is decided; LBP-18-2, 87 NRC 28 (2018)
- 10 C.F.R. Part 50
medical radioisotope production facility will need to apply for and obtain an operating license as well as
a license to receive, possess, and use special nuclear material in its operations, including the proposed
target fabrication process; CLI-18-6, 87 NRC 141 (2018)
- 10 C.F.R. 50.12(a)
NRC Staff may approve an exemption for a departure from a certified design where it finds that the
exemption is authorized by law, will not present an undue risk to the public health and safety, is
consistent with the common defense and security, and special circumstances exist that warrant the
exemption; CLI-18-1, 87 NRC 54 (2018)
- 10 C.F.R. 50.34a
design of the liquid waste management system must satisfy the requirements of this regulation; CLI-18-1,
87 NRC 61-62 n.130 (2018)
- 10 C.F.R. 50.35(a)
safety determinations that NRC must make to allow construction of a commercial medical radioisotope
production facility are described; CLI-18-6, 87 NRC 134-35 (2018)
- 10 C.F.R. 50.35(a)(4)(ii)
findings for issuance of a construction permit require that site criteria in 10 C.F.R. Part 100 be
considered to ensure that the proposed radioisotope production facility can be constructed and operated
at the proposed location without undue risk to the health and safety of the public; CLI-18-6, 87 NRC
146 (2018)
- 10 C.F.R. 50.35(b)
construction permit, when issued, constitutes an authorization to proceed with construction, but does not
constitute approval of the design; CLI-18-6, 87 NRC 140 (2018)
- 10 C.F.R. 50.35(c)
final detailed facility design may be submitted as part of a future operating license application; CLI-18-6,
87 NRC 140 (2018)
- 10 C.F.R. 50.40(a)-(d)
in making its findings on a construction permit for a commercial medical radioisotope production facility,
the Commission is guided by the additional considerations in this regulation; CLI-18-6, 87 NRC 135
(2018)

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- 10 C.F.R. 50.50
NRC will issue a construction permit in such form and containing such conditions and limitations that it deems appropriate and necessary; CLI-18-6, 87 NRC 136 (2018)
- 10 C.F.R. 50.65(a)
board excluded petitioner's claim that monitoring intervals are too fixed on the ground that this claim constituted an impermissible challenge to the maintenance rule; CLI-18-4, 87 NRC 108 (2018)
- 10 C.F.R. 50.65(a)(1)
licensees are required to monitor performance or condition of structures, systems, or components against licensee-established goals, in a manner sufficient to provide reasonable assurance that these SSCs are capable of fulfilling their intended functions; CLI-18-4, 87 NRC 110 n.152 (2018)
- 10 C.F.R. 50.150(a)(1)
applicant for a combined license under Part 52 must include in the application a design-specific assessment of the proposed facility's ability to withstand the impact of an aircraft crash; CLI-18-5, 87 NRC 124 n.22 (2018)
- 10 C.F.R. Part 50, Appendix A, GDC 2
nuclear power plant structures, systems, and components important to safety must be designed to withstand the effects of earthquakes and other natural phenomena without loss of their safety functionality; CLI-18-4, 87 NRC 91 (2018)
- 10 C.F.R. Part 50, Appendix A, GDC 60 and 61
design of the liquid waste management system must satisfy the requirements of this regulation; CLI-18-1, 87 NRC 61-62 n.130 (2018)
- 10 C.F.R. Part 50, Appendix B, Criterion III
failure to identify design deficiencies involving secondary missiles from the safety-related main steam safety valve room pressurization is a non-cited violation; DD-18-1, 87 NRC 116 (2018)
licensee must provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternative or simplified calculational methods, or by the performance of a suitable testing program; DD-18-1, 87 NRC 114 (2018)
- 10 C.F.R. Part 50, Appendix B, Criterion XVI
failure to correct the design deficiencies is a non-cited violation; DD-18-1, 87 NRC 116 (2018)
measures must be established to ensure that conditions adverse to quality, such as nonconformances, are promptly identified and corrected; DD-18-1, 87 NRC 115-16 (2018)
- 10 C.F.R. Part 50, Appendix E, Criterion IV.5-7
emergency plans must be continually maintained and updated, including accounting for changes in population characteristics; CLI-18-1, 87 NRC 63 n.139 (2018)
- 10 C.F.R. Part 50, Appendix I
criteria for evaluating dose are normally used in calculating dose to the maximally exposed individual for surface water disposals of liquid effluent; CLI-18-1, 87 NRC 61 (2018)
- 10 C.F.R. Part 51, Subpart A, Appendix A, § 5
alternatives analysis is the heart of the environmental impact statement; CLI-18-6, 87 NRC 160 (2018)
- 10 C.F.R. 51.10
NRC is required to consider the impacts of its actions on environmental values; CLI-18-6, 87 NRC 135 (2018)
- 10 C.F.R. 51.45
migration of contention that applicant fails to include adequate hydrogeological information to demonstrate ability to contain fluid migration is decided; LBP-18-2, 87 NRC 28, 37 n.8 (2018)
migration of contention that materials license amendment application fails to provide sufficient information to establish potential effects of the project on the adjacent surface water and groundwater resources is decided; LBP-18-2, 87 NRC 28 (2018)
- 10 C.F.R. 51.50(b)(1)
spent fuel pool fire analysis is not required at the early site permit stage because focus of an early site permit is the alternative site analysis and whether there is any obviously superior alternative to the site proposed; CLI-18-5, 87 NRC 126 (2018)
- 10 C.F.R. 51.50(b)(2)
early site permit applicant may choose to defer until the combined license stage a discussion of need for power and energy alternatives; CLI-18-5, 87 NRC 127, 129 (2018)

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- environmental report may address one or more of the environmental effects of construction and operation of a reactor, or reactors, which have design characteristics that fall within the site characteristics and design parameters for the early site permit application; CLI-18-5, 87 NRC 126 & n.41 (2018)
- 10 C.F.R. 51.60
migration of contention that applicant fails to include adequate hydrogeological information to demonstrate ability to contain fluid migration is decided; LBP-18-2, 87 NRC 28, 37 n.8 (2018)
- 10 C.F.R. 51.75(b), 51.75(b)(2)
NRC Staff must not include a discussion of need for power or energy alternatives if they are not addressed in the environmental report; CLI-18-5, 87 NRC 128 n.52 (2018)
- 10 C.F.R. 51.105
to ensure that NRC's obligations are fulfilled for a construction permit proceeding for a commercial medical radioisotope production facility, NRC must determine whether the NEPA review conducted by NRC Staff has been adequate; CLI-18-6, 87 NRC 136 (2018)
- 10 C.F.R. 51.105(a)
environmental findings that NRC must make to support issuance of a construction permit for a commercial medical radioisotope production facility are described; CLI-18-6, 87 NRC 135 (2018)
NRC Staff must weigh unavoidable adverse environmental impacts and resource commitments (environmental costs) of the project against the project's benefits; CLI-18-6, 87 NRC 160 (2018)
- 10 C.F.R. 51.107(a)
environmental matters that must be must addressed in the combined license mandatory hearing are outlined; CLI-18-1, 87 NRC 45 (2018)
in uncontested mandatory proceeding, Commission considers NRC Staff review of the application has been adequate to support the findings set forth in this regulation; CLI-18-1, 87 NRC 42 (2018)
NRC must weigh unavoidable adverse environmental impacts and resource commitments (environmental costs) of the project against the project's benefits; CLI-18-1, 87 NRC 76 (2018)
- 10 C.F.R. Part 51, Appendix A, § 5
alternatives analysis is the heart of the environmental impact statement; CLI-18-1, 87 NRC 74 (2018)
- 10 C.F.R. 52.7
NRC Staff may approve an exemption for a departure from a certified design where it finds that the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption; CLI-18-1, 87 NRC 54 (2018)
- 10 C.F.R. 52.63
safety matters resolved at the design certification stage are generally excluded from review of a combined license; CLI-18-1, 87 NRC 43 n.6 (2018)
- 10 C.F.R. 52.63(b)(1)
NRC Staff may approve an exemption for a departure from a certified design where it finds that the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption; CLI-18-1, 87 NRC 54 (2018)
NRC Staff must determine that the special circumstances warranting an exemption for a departure from a certified design outweigh any decrease in safety resulting from the reduction in standardization that may result from the exemption; CLI-18-1, 87 NRC 54 (2018)
- 10 C.F.R. 52.87
Advisory Committee on Reactor Safeguards is a committee of technical experts who provide the Commission with an independent assessment of the safety aspects of an application; CLI-18-1, 87 NRC 44 (2018)
- 10 C.F.R. 52.93
requirements that combined license applicants must meet to obtain an exemption from NRC regulations are found in this regulation; CLI-18-1, 87 NRC 54 (2018)
- 10 C.F.R. 52.93(a)(1)
exemption from this regulation was found to be necessary and acceptable; CLI-18-1, 87 NRC 55 (2018)
- 10 C.F.R. 52.97(a)
in uncontested mandatory proceeding, Commission considers that NRC Staff review of the application has been adequate to support the findings set forth in this regulation; CLI-18-1, 87 NRC 42 (2018)

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- 10 C.F.R. 52.97(a)(1)
safety matters that must be must addressed in the combined license mandatory hearing are outlined;
CLI-18-1, 87 NRC 44-45 (2018)
- 10 C.F.R. Part 52, Appendix D
combined license application references latest revision of the AP1000 certified reactor design; CLI-18-1,
87 NRC 42-43 (2018)
- 10 C.F.R. Part 52, Appendix D, IV.A.2.a
exemption from certain combined license application organization and numbering requirements was
requested in order to be consistent with NRC guidance in Regulatory Guide 1.206 and NUREG-0800;
CLI-18-1, 87 NRC 55 (2018)
- 10 C.F.R. Part 52, Appendix D, VIII.A.4
departures from a certified design that involve a change to the design as described in the rule certifying
the design require an exemption from NRC regulations; CLI-18-1, 87 NRC 54 (2018)
- 10 C.F.R. Part 52, Appendix D, VIII.B.5
where a combined license applicant references a certified design, changes to the design may be made in
the combined license if proposed as a departure from the certified design, but some departures may be
made without prior Commission approval; CLI-18-1, 87 NRC 54 (2018)
- 10 C.F.R. Part 70
medical radioisotope production facility will need to apply for and obtain an operating license as well as
a license to receive, possess, and use special nuclear material in its operations, including the proposed
target fabrication process; CLI-18-6, 87 NRC 141 n.62 (2018)
- methodologies described in standard review plan for fuel cycle facility are an acceptable way to
demonstrate adequate safety in design and operation of a radioisotope production facility; CLI-18-6, 87
NRC 142 (2018)
- 10 C.F.R. 70.21(f)
license application to possess and use special nuclear material for processing and fuel fabrication, scrap
recovery or conversion of uranium hexafluoride, or for conduct of any other activity that will
significantly affect the quality of the environment shall be filed at least 9 months prior to
commencement of construction of the plant or facility and shall be accompanied by an environmental
report; CLI-18-6, 87 NRC 157 n.194 (2018)
- 10 C.F.R. 70.23(a)(7)
exemption from regulation will be granted if target fabrication will not affect the quality of the
environment after weighing the environmental, economic, technical, and other benefits against
environmental costs and considering available alternatives; CLI-18-6, 87 NRC 157 n.194 (2018)
- 10 C.F.R. 70.24(a)
periodic reports regarding design of the criticality accident alarm system must demonstrate sufficient
detector coverage to meet the requirements in this regulation; CLI-18-6, 87 NRC 149 (2018)
- 10 C.F.R. 70.61
application of radiological and chemical consequence and likelihood criteria in accident analysis for
radioisotope production facility is acceptable; CLI-18-6, 87 NRC 145 (2018)
- proposed design of medical radioisotope production facility incorporates safety-related and
non-safety-related structures, systems, and components that are further categorized based on whether
they would be designed to meet the performance requirements for accidents or for normal operations;
CLI-18-6, 87 NRC 142 (2018)
- 10 C.F.R. 70.61(b)-(e)
items relied on for safety are engineered or administrative controls or control systems that are applied to
reduce the likelihood of an accident such that the event either becomes highly unlikely or its
consequences are reduced to meet the performance requirements in this regulation; CLI-18-6, 87 NRC
142 n.65 (2018)
- 10 C.F.R. Part 70, Appendix H
accident analysis methodology for radioisotope production facility is discussed; CLI-18-6, 87 NRC 144-45
(2018)
- 10 C.F.R. Part 100
criteria of this part do not expressly apply to radioisotope production facilities; CLI-18-6, 87 NRC 146
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REGULATIONS

- 10 C.F.R. 100.21(h)
in determining reactor site acceptability, NRC Staff evaluates physical characteristics of the site, with particular focus on security and emergency plans and measures that ensure the public health and safety; CLI-18-1, 87 NRC 62-63 (2018)
reactor sites in areas of low population density are generally preferred, but a particular site not in an area of low density but located away from a high-density population may still be acceptable; CLI-18-1, 87 NRC 62-63 (2018)
- 10 C.F.R. 110.2
in context of import and export licensing, “radioactive waste” is defined; CLI-18-2, 87 NRC 83-84 (2018)
- 10 C.F.R. 110.19
a general license is effective without the filing of an application with the Commission or the issuance of licensing documents to a particular person; CLI-18-2, 87 NRC 83 n.25 (2018)
- 10 C.F.R. 110.27
two exceptions to the general license would require an importer to seek a specific license; CLI-18-2, 87 NRC 83 (2018)
- 10 C.F.R. 110.27(a)
general license may be granted to any person for the import of byproduct, source, or special nuclear material if the U.S. consignee is authorized to receive and possess the material under the relevant NRC or Agreement State regulations; CLI-18-2, 87 NRC 83 (2018)
- 10 C.F.R. 110.27(b)
general license does not authorize the import of more than 100 kilograms per shipment of source and/or special nuclear material; CLI-18-2, 87 NRC 83 (2018)
- 10 C.F.R. 110.27(c)
general license does not authorize the import of radioactive waste in any quantity; CLI-18-2, 87 NRC 83 (2018)
- 10 C.F.R. 110.80
procedures in Part 110 will constitute the exclusive basis for hearings on export and import license applications; CLI-18-2, 87 NRC 80 n.10 (2018)
- 10 C.F.R. 110.82(b)
if an export license hearing request or intervention petition asserts an interest that may be affected, the Commission will consider nature of the alleged interest, how that issue relates to issuance or denial, and possible effect of any order on that interest; CLI-18-2, 87 NRC 81 (2018)
- 10 C.F.R. 110.82(b)(3)
hearing requests in export cases must explain why a hearing or intervention would be in the public interest and how it would assist the Commission in making the required statutory determinations; CLI-18-2, 87 NRC 81 (2018)
- 10 C.F.R. 110.82(b)(4)
export license hearing request must specify, when a person asserts that his interest may be affected, both the facts pertaining to his interest and how it may be affected; CLI-18-2, 87 NRC 81 (2018)
- 10 C.F.R. 110.84(a)
factors considered in determining whether hearing requests in export cases will be granted are described; CLI-18-2, 87 NRC 81 (2018)
- 10 C.F.R. 110.84(b)
petitioners’ standing arguments for intervention in an export license proceeding are considered under the “interest” provisions; CLI-18-2, 87 NRC 81 n.17 (2018)
- 10 C.F.R. 110.111
to the extent that petitioners seek to waive Part 110’s definition of radioactive waste for this particular proceeding so that applicant would need a specific import license, Commission finds that petitioners have not shown that the definition of “radioactive waste” fails to serve the purposes for which it was adopted; CLI-18-2, 87 NRC 85 (2018)
- 18 C.F.R. Part 35 (2011)
Federal Energy Regulatory Commission has recently adopted policies that promote the expansion of the transmission grid; LBP-18-1, 87 NRC 13-14 n.10 (2018)

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- Atomic Energy Act 42 U.S.C. § 2155a
public participation in export licensing proceedings is allowed only when such participation will be in the public interest and will assist the Commission in making its statutory determinations; CLI-18-2, 87 NRC 80 (2018)
- Atomic Energy Act, 182b, 42 U.S.C. § 2232(b)
Advisory Committee on Reactor Safeguards is a committee of technical experts who provide NRC with an independent assessment of the safety aspects of an application; CLI-18-1, 87 NRC 44 (2018)
- Atomic Energy Act, 189a, 42 U.S.C. § 2239(a)
NRC must hold a hearing after 30 days' notice and publication in the Federal Register, on each application under section 103 or 104b for a construction permit for a facility, and on any application under section 104c for a construction permit for a testing facility; CLI-18-6, 87 NRC 134 n.9 (2018)
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- Clean Water Act, 404
all nondiscretionary terms and conditions of the Incidental Take Statement for endangered or threatened species will be incorporated into either the combined licenses issued by NRC or the Department of the Army permit issued by the Corps of Engineers; CLI-18-1, 87 NRC 68-69 (2018)
- Endangered Species Act, 7(a)(2), 16 U.S.C. § 1536(a)(2)
agency must consult with the Secretary of the Interior or of Commerce, as appropriate, to ensure that any action authorized, funded, or carried out by such an agency is not likely to jeopardize the continued existence of any endangered or threatened species or their critical habitat; CLI-18-6, 87 NRC 134 n.163 (2018)
any action authorized by NRC must not jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify their critical habitat; CLI-18-1, 87 NRC 67 (2018)
- Endangered Species Act, 16 U.S.C. § 1536(a)(3), (a)(4)
NRC must consult with the Fish and Wildlife Service or the National Marine Fisheries Service, as appropriate, on activities that may affect a listed species or a species proposed to be listed as endangered or threatened; CLI-18-1, 87 NRC 67 & n.132 (2018)
- National Environmental Policy Act, 102(2), 42 U.S.C. § 4332(2)
NRC is required to consider the impacts of its actions on environmental values; CLI-18-6, 87 NRC 135 (2018)
- National Environmental Policy Act, 102(2)(A), 42 U.S.C. § 4332(2)(A)
agencies must use a systematic, interdisciplinary approach that will insure the integrated use of the natural and social sciences and the environmental design arts in decisionmaking that may impact the environment; CLI-18-1, 87 NRC 73 (2018); CLI-18-6, 87 NRC 159 n.199 (2018)
- National Environmental Policy Act, 102(2)(C), 42 U.S.C. § 4332(2)(C)
NRC must assess the relationship between short-term uses and long-term productivity of the environment, including benefits of operating new units, alternatives, and unavoidable adverse environmental impacts and irreversible and irretrievable commitments of resources associated with the proposed action; CLI-18-1, 87 NRC 73 (2018)
- National Environmental Policy Act, 102(2)(C)(ii)-(v), 42 U.S.C. § 4332(2)(C)(ii)-(v)
environmental impact statement must assess the relationship between local short-term uses and long-term productivity of the environment, consider alternatives, and describe unavoidable adverse environmental

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impacts and the irreversible and irretrievable commitments of resources associated with the proposed action; CLI-18-6, 87 NRC 159 (2018)

National Environmental Policy Act, 102(2)(E), 42 U.S.C. § 4332(2)(E)

agencies must study, develop, and describe appropriate alternatives to proposed actions; CLI-18-1, 87 NRC 74 (2018); CLI-18-6, 87 NRC 160 (2018)

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ABEYANCE OF HEARING REQUEST

in light of Settlement Agreement and petitioners' notices of anticipated withdrawal, motion to hold in abeyance petition for leave to intervene and request for hearing is granted pending further notification from petitioners or applicants or further Commission order; CLI-18-3, 87 NRC 87 (2018)

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analysis methodology for radioisotope production facility is discussed; CLI-18-6, 87 NRC 130 (2018)

application of radiological and chemical consequence and likelihood criteria in accident analysis for radioisotope production facility is acceptable; CLI-18-6, 87 NRC 130 (2018)

items relied on for safety are engineered or administrative controls or control systems that are applied to reduce the likelihood of an accident such that the event either becomes highly unlikely or its consequences are reduced to meet the performance requirements in 10 C.F.R. 70.61(b)-(e); CLI-18-6, 87 NRC 130 (2018)

NRC is required under NEPA to address the environmental consequences of spent fuel pool accidents unless they could be found to be remote and speculative; CLI-18-5, 87 NRC 119 (2018)

periodic reports regarding design of the Criticality Accident Alarm System must demonstrate sufficient detector coverage to meet the requirements in 10 C.F.R. 70.24(a); CLI-18-6, 87 NRC 130 (2018)

See also Fukushima Accident

ADJUDICATORY PROCEEDINGS

See Combined License Proceedings; Construction Permit Proceeding; License Transfer Proceedings;

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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contention alleging that license renewal application does not undertake an adequate aging management review of the concrete on the containment vessel fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)

license renewal applicant's use of an aging management program identified in the GALL Report constitutes reasonable assurance that it will manage the targeted aging effect during the renewal period; LBP-18-1, 87 NRC 1 (2018)

AIRCRAFT CRASHES

applicant for a combined license under Part 52 must include in the application a design-specific assessment of the proposed facility's ability to withstand the impact of an aircraft crash; CLI-18-5, 87 NRC 119 (2018)

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periodic reports regarding design of the Criticality Accident Alarm System must demonstrate sufficient detector coverage to meet the requirements in 10 C.F.R. 70.24(a); CLI-18-6, 87 NRC 130 (2018)

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board excluded petitioner's claim that monitoring intervals are too fixed on the ground that this claim constituted an impermissible challenge to the maintenance rule; CLI-18-4, 87 NRC 89 (2018)

challenge to testing and analysis protocols for core sampling represents a particularized challenge to applicant's license amendment request; CLI-18-4, 87 NRC 89 (2018)

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contention alleging that license renewal application does not undertake an adequate aging management review of the concrete on the containment vessel fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)

contention that license renewal application is deficient for failing to discuss the ASTM standards does not raise a genuine dispute on an issue of material law or fact regarding adequacy of the LRA's treatment of alkali-silica reaction-induced degradation in licensee's drywell; LBP-18-1, 87 NRC 1 (2018)

petitioner's arguments fail to raise a genuine dispute on a material issue of law or fact regarding the license renewal application's discussion of ASR; LBP-18-1, 87 NRC 1 (2018)

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if a contention of omission challenging absence of information in an environmental report, and new licensing documents are provided that supply such information, the previous contention loses its efficacy and the adequacy of the new information should become the focus of concern in that new claims must be raised in a new or amended contention; LBP-18-2, 87 NRC 21 (2018)

intervenor seeking to admit a new or amended contention must base its filing on information that is materially different from that which was previously available; LBP-18-2, 87 NRC 21 (2018)

significant change in the nature of the purported NEPA imperfection, from one focusing on comprehensive information omission to one centered on a deficient analysis of subsequently supplied information, warrants issue modification by the complaining party; LBP-18-2, 87 NRC 21 (2018)

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appeal as of right on the question whether a petition to intervene should have been wholly denied is allowed; CLI-18-4, 87 NRC 89 (2018)

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city denied party status may appeal at the end of the proceeding; CLI-18-1, 87 NRC 39 (2018)

party other than petitioner has a right to appeal on the question whether a petition to intervene should have been wholly denied; CLI-18-5, 87 NRC 119 (2018)

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Commission defers to a board's contention admissibility rulings unless the appeal points to an error of law or abuse of discretion; CLI-18-4, 87 NRC 89 (2018); CLI-18-5, 87 NRC 119 (2018)

ATOMIC ENERGY ACT

Advisory Committee on Reactor Safeguards is a committee of technical experts who provide the Commission with an independent assessment of the safety aspects of an application; CLI-18-1, 87 NRC 39 (2018)

NRC must hold a hearing after 30 days' notice and publication in the Federal Register on each application under section 103 or 104b for a construction permit for a facility and on any application under section 104c for a construction permit for a testing facility; CLI-18-6, 87 NRC 130 (2018)

NRC must hold a hearing on each application to construct a nuclear power plant, regardless of whether an interested member of the public requests a hearing on the application; CLI-18-1, 87 NRC 39 (2018)

public participation in export licensing proceedings is allowed only when such participation will be in the public interest and will assist the Commission in making the required statutory determinations; CLI-18-2, 87 NRC 78 (2018)

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NRC must assess the relationship between short-term uses and long-term productivity of the environment, including consideration of the benefits of operating new units, consider alternatives, and describe unavoidable adverse environmental impacts and irreversible and irretrievable commitments of resources associated with the proposed action; CLI-18-1, 87 NRC 39 (2018)

NRC must weigh unavoidable adverse environmental impacts and resource commitments (environmental costs) of the project against the project's benefits; CLI-18-1, 87 NRC 39 (2018)

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movant challenging contention migration has the burden of proof to show that it should not be permitted; LBP-18-2, 87 NRC 21 (2018)

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medical radioisotope production facility will need to apply for and obtain a license to process and ship molybdenum-99; CLI-18-6, 87 NRC 130 (2018)

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all nondiscretionary terms and conditions of the Incidental Take Statement for endangered or threatened species will be incorporated into either the combined licenses issued by NRC or the Department of the Army permit issued by the Corps of Engineers; CLI-18-1, 87 NRC 39 (2018)

COMBINED LICENSE APPLICATION

applicant must include a design-specific assessment of the proposed facility's ability to withstand the impact of an aircraft crash; CLI-18-5, 87 NRC 119 (2018)
applicant references latest revision of the AP1000 certified reactor design; CLI-18-1, 87 NRC 39 (2018)
departures from a certified design that involve a change to the design as described in the rule certifying the design require an exemption from NRC regulations; CLI-18-1, 87 NRC 39 (2018)
exemption from certain organization and numbering requirements was requested in order to be consistent with NRC guidance in Regulatory Guide 1.206 and NUREG-0800; CLI-18-1, 87 NRC 39 (2018)
NRC Staff designated the Levy County combined license application as a "reference" application for five common departures and exemptions; CLI-18-1, 87 NRC 39 (2018)
requirements that applicants must meet to obtain an exemption from NRC regulations are found in 10 C.F.R. 52.93; CLI-18-1, 87 NRC 39 (2018)
where applicant references a certified design, changes to the design may be made in the combined license if proposed as a departure from the certified design, but some departures may be made without prior Commission approval; CLI-18-1, 87 NRC 39 (2018)

COMBINED LICENSE PROCEEDINGS

all safety and environmental matters, except those resolved in the contested proceeding, are subject to review in the uncontested proceeding; CLI-18-1, 87 NRC 39 (2018)
application is not reviewed de novo in the mandatory hearing but rather, the inquiry is whether NRC Staff's review was sufficient to support its findings; CLI-18-1, 87 NRC 39 (2018)
Commission is not required under the Atomic Energy Act to make predictive findings regarding technical feasibility of spent fuel disposal as part of its reactor licensing decisions; CLI-18-1, 87 NRC 39 (2018)
environmental matters that must be must addressed in the mandatory hearing are outlined in 10 C.F.R. 51.107(a); CLI-18-1, 87 NRC 39 (2018)
in uncontested mandatory proceeding, Commission considers whether NRC Staff review of the application has been adequate; CLI-18-1, 87 NRC 39 (2018)
safety matters resolved at the design certification stage are generally excluded from review of a COL; CLI-18-1, 87 NRC 39 (2018)
safety matters that must be must addressed in the mandatory hearing are outlined in 10 C.F.R. 52.97(a)(1); CLI-18-1, 87 NRC 39 (2018)

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contention alleging that license renewal application does not undertake an adequate aging management review of the concrete on the containment vessel fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)

CONSIDERATION OF ALTERNATIVES

agencies must study, develop, and describe appropriate alternatives to proposed actions; CLI-18-1, 87 NRC 39 (2018); CLI-18-6, 87 NRC 130 (2018)
agencies need only discuss those alternatives that are reasonable and will bring about the ends of the proposed action; LBP-18-1, 87 NRC 1 (2018)
alternatives analysis is the heart of the environmental impact statement; CLI-18-1, 87 NRC 39 (2018); CLI-18-6, 87 NRC 130 (2018)
at contention admissibility stage, petitioner bears the burden of providing some minimal factual support or expert opinion sufficient to demonstrate a genuine dispute as to whether an alternative energy source or a combination of sources can meet that standard; LBP-18-1, 87 NRC 1 (2018)
contention alleging that the environmental report failed to consider renewable energy and energy efficiency as alternatives to renewing an operating license fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)
early site permit applicant may choose to defer until the combined license stage a discussion of need for power and energy alternatives; CLI-18-5, 87 NRC 119 (2018)
for an alternative energy source to be deemed reasonable, it must be a current or impending reality in the region of interest; LBP-18-1, 87 NRC 1 (2018)

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in reactor license renewal applications, a reasonable alternative energy source should be commercially viable and technically capable of producing the required baseload power in the region of interest by the expiration date of the license; LBP-18-1, 87 NRC 1 (2018)

NEPA does not require consideration of alternatives that are only remote and speculative possibilities; LBP-18-1, 87 NRC 1 (2018)

NEPA requires an environmental report to address the environmental impacts of the proposed action and compare them to impacts of reasonable alternatives to the proposed action; LBP-18-1, 87 NRC 1 (2018)

NRC Staff must not include a discussion of need for power or energy alternatives if they are not addressed in the environmental report; CLI-18-5, 87 NRC 119 (2018)

spent fuel pool fire analysis is not required at the early site permit stage because focus of an early site permit is the alternative site analysis and whether there is any obviously superior alternative to the site proposed; CLI-18-5, 87 NRC 119 (2018)

CONSTRUCTION PERMIT PROCEEDING

Commission does not review construction permit application de novo, but rather determines whether NRC Staff's review was sufficient to support the required findings; CLI-18-6, 87 NRC 130 (2018)

Commission must hold a hearing after 30 days' notice and publication in the Federal Register on each application under AEA section 103 or 104b for a construction permit for a facility, and on any application under AEA section 104c for a construction permit for a testing facility; CLI-18-6, 87 NRC 130 (2018)

CONSTRUCTION PERMITS

environmental findings that NRC must make to support issuance of a permit for a commercial medical radioisotope production facility are described; CLI-18-6, 87 NRC 130 (2018)

findings for issuance of a construction permit require that site criteria in 10 C.F.R. Part 100 be considered to ensure that the proposed radioisotope production facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public; CLI-18-6, 87 NRC 130 (2018)

in making its findings for a commercial medical radioisotope production facility, the Commission is guided by the additional considerations in 10 C.F.R. 50.40(a)-(d); CLI-18-6, 87 NRC 130 (2018)

NRC will issue a construction permit in such form and containing such conditions and limitations that it deems appropriate and necessary; CLI-18-6, 87 NRC 130 (2018)

safety determinations that NRC must make to allow construction of a commercial medical radioisotope production facility are described; CLI-18-6, 87 NRC 130 (2018)

to ensure that NRC's obligations are fulfilled for a construction permit proceeding for a commercial medical radioisotope production facility, NRC must determine whether the NEPA review conducted by NRC Staff has been adequate; CLI-18-6, 87 NRC 130 (2018)

when issued, permit constitutes an authorization to proceed with construction, but does not constitute approval of the design; CLI-18-6, 87 NRC 130 (2018)

CONSULTATION DUTY

NRC must consult with the Fish and Wildlife Service or the National Marine Fisheries Service, as appropriate, on activities that may affect a listed species or a species proposed to be listed as endangered or threatened; CLI-18-1, 87 NRC 39 (2018)

CONTAINMENT

contention alleging that license renewal application does not undertake an adequate aging management review of the concrete on the containment vessel fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)

CONTENTIONS

contentions of omission claim an omission of necessary information, and contentions of adequacy challenge substantively and specifically how particular information has been discussed in a license application; CLI-18-5, 87 NRC 119 (2018); LBP-18-2, 87 NRC 21 (2018)

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arguments raised for the first time on appeal will not be considered; CLI-18-4, 87 NRC 89 (2018)

board excluded petitioner's claim that monitoring intervals are too fixed on the grounds that this claim constituted an impermissible challenge to the maintenance rule; CLI-18-4, 87 NRC 89 (2018)

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- board's contention admissibility decision was reversed on the ground that the board improperly provided the nexus between proposed contentions and the application, and itself supplied support for those contentions; CLI-18-4, 87 NRC 89 (2018)
- board's rejection of a hearing request in which requester sought a hearing on an individual licensing action on the ground that NRC Staff had constructively denied its pending rulemaking petition was affirmed; CLI-18-4, 87 NRC 89 (2018)
- boards need only permit migration of an admitted contention where information in NRC Staff's environmental review document is sufficiently similar to material in applicant's environmental report; LBP-18-2, 87 NRC 21 (2018)
- challenge to testing and analysis protocols for core sampling represents a particularized challenge to applicant's license amendment request; CLI-18-4, 87 NRC 89 (2018)
- contention alleging that license renewal application does not undertake an adequate aging management review of the concrete on the containment vessel fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)
- contention alleging that the environmental report failed to consider renewable energy and energy efficiency as alternatives to renewing an operating license fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)
- contention challenging applicant's environmental report generally may be viewed by a board as a challenge to NRC Staff's subsequently issued environmental review documents; LBP-18-2, 87 NRC 21 (2018)
- contention that applicant's environmental report does not properly and adequately state a purpose and need for relicensing fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)
- contention that fails to directly controvert the license application is subject to dismissal; LBP-18-1, 87 NRC 1 (2018)
- contention that license renewal application is deficient for failing to discuss the ASTM standards does not raise a genuine dispute on an issue of material law or fact regarding the adequacy of the LRA's treatment of alkali-silica reaction-induced degradation in licensee's drywell; LBP-18-1, 87 NRC 1 (2018)
- contention's sponsor may choose not to make any submission regarding an admitted ER-based environmental contention that it believes will properly migrate and can simply await an applicant or NRC Staff filing challenging the contention's continued viability in light of the Staff's environmental document; LBP-18-2, 87 NRC 21 (2018)
- contentions are admissible if they satisfy all six criteria of 10 C.F.R. 2.309(f)(1); CLI-18-4, 87 NRC 89 (2018); LBP-18-1, 87 NRC 1 (2018)
- contentions must be raised at the earliest possible opportunity; CLI-18-5, 87 NRC 119 (2018)
- contentions of omission generally need not provide the same level of factual support required for a contention challenging the adequacy of information in an application; CLI-18-5, 87 NRC 119 (2018)
- document put forth by an intervenor as the basis for a contention is subject to scrutiny both for what it does and does not show; CLI-18-4, 87 NRC 89 (2018)
- failure to file contentions based on applicant's environmental report could result in dismissal of the contention as impermissibly late; CLI-18-5, 87 NRC 119 (2018)
- failure to fulfill any of the contention admissibility requirements of 10 C.F.R. 2.309(f)(1) renders a contention inadmissible; LBP-18-1, 87 NRC 1 (2018)
- failure to submit a contention migration declaration is not, in and of itself, a reason for a board to refuse to allow the environmental portion of a contention to migrate as a challenge to the Staff's draft EA; LBP-18-2, 87 NRC 21 (2018)
- identification of an omission in the environmental report and demonstration that spent fuel pool accident consequences either must be considered or shown to be remote and speculative to satisfy the NRC's obligations under NEPA is sufficient for an admissible contention of omission; CLI-18-5, 87 NRC 119 (2018)
- if a contention of omission challenging an absence of information in an ER, and new licensing documents are provided that supply such information, the previous contention loses its efficacy and the adequacy of the new information should become the focus of concern in that new claims must be raised in a new or amended contention; LBP-18-2, 87 NRC 21 (2018)
- in applying the migration tenet, consideration must be given to the case law that distinguishes between a contention of omission and a contention of adequacy; LBP-18-2, 87 NRC 21 (2018)

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- in appropriate circumstances, a board may define the scope of a contention in light of the foundational support that leads to its admission; LBP-18-2, 87 NRC 21 (2018)
- in determining contention admissibility, licensing board has authority to reformulate contentions to eliminate extraneous issues or to consolidate issues for a more efficient proceeding; CLI-18-4, 87 NRC 89 (2018)
- intervenor seeking to admit a new or amended contention must base its filing on information that is materially different from that which was previously available; LBP-18-2, 87 NRC 21 (2018)
- it is enough for a petitioner to identify, in a contention of omission, information that is claimed to be missing and demonstrate why that information is required; CLI-18-5, 87 NRC 119 (2018)
- key limitation of the board's reformulation authority is that the board may not provide new or missing information to render a contention admissible; CLI-18-4, 87 NRC 89 (2018)
- licensing board should not accept in individual license proceedings contentions that are or are about to become the subject of general rulemaking by the Commission; CLI-18-4, 87 NRC 89 (2018)
- migration of contention that applicant fails to include adequate hydrogeological information to demonstrate ability to contain fluid migration is decided; LBP-18-2, 87 NRC 21 (2018)
- migration tenet allows a previously admitted contention challenging applicant's environmental report to be construed as a challenge to a later-issued NRC Staff environmental review document without requiring the contention's proponent to file a new or amended contention; LBP-18-2, 87 NRC 21 (2018)
- migration tenet may not be used to change the basic form of a contention from a contention of omission to one of adequacy; LBP-18-2, 87 NRC 21 (2018)
- motion to deny contention migration must state with particularity the grounds upon which relief is sought and be accompanied by any affidavits or other evidence relied on; LBP-18-2, 87 NRC 21 (2018)
- NRC rules are not subject to collateral attack during adjudicatory proceedings; CLI-18-2, 87 NRC 78 (2018)
- NRC's contention admissibility rule properly reserves its hearing process for genuine, material controversies between knowledgeable litigants; LBP-18-1, 87 NRC 1 (2018)
- petitioner bears the burden of providing some minimal factual support or expert opinion sufficient to demonstrate a genuine dispute as to whether an alternative energy source or a combination of sources can meet that standard; LBP-18-1, 87 NRC 1 (2018)
- petitioner must point to a deficiency in the application, and not merely suggest other ways an analysis could have been done; CLI-18-4, 87 NRC 89 (2018)
- petitioner, not the board, must provide the information required to satisfy contention admissibility standards; CLI-18-4, 87 NRC 89 (2018)
- petitioner's arguments fail to raise a genuine dispute on a material issue of law or fact regarding the license renewal application's discussion of alkali-silica reaction; LBP-18-1, 87 NRC 1 (2018)
- proponent of a contention is not required to resubmit the contention if it maintains that the contention will properly migrate; LBP-18-2, 87 NRC 21 (2018)
- reliance solely on an information notice to support a contention is insufficient; LBP-18-1, 87 NRC 1 (2018)
- rule prohibiting litigation of matters that are or are about to become subject to rulemaking does not apply; CLI-18-4, 87 NRC 89 (2018)
- standard does not contemplate a determination of the merits of a proffered contention
- standards are strict by design and failure to fulfill any one of the standards renders a contention inadmissible; CLI-18-4, 87 NRC 89 (2018); LBP-18-1, 87 NRC 1 (2018)
- standards require more than identification of a desired result; CLI-18-4, 87 NRC 89 (2018)
- CONTENTIONS, LATE-FILED**
- intervenor seeking to admit a new or amended contention must base its filing on information that is materially different from that which was previously available; LBP-18-2, 87 NRC 21 (2018)
- petitioner must provide appropriate affidavits, declarations, or other information explaining to the board why the subsequent licensing documents contain new information that is materially different such that the petitioner could not have proffered the contention earlier in the proceeding; LBP-18-2, 87 NRC 21 (2018)
- subsequent challenge to the adequacy of whatever analysis is supplied in a combined license application would need to meet the requirements for a new contention; CLI-18-5, 87 NRC 119 (2018)

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CORRECTIVE ACTION VERIFICATION PROGRAM

measures must be established to ensure that conditions adverse to quality, such as nonconformances, are promptly identified and corrected; DD-18-1, 87 NRC 111 (2018)

CRITICALITY

periodic reports regarding design of the criticality accident alarm system must demonstrate sufficient detector coverage to meet the requirements in 10 C.F.R. 70.24(a); CLI-18-6, 87 NRC 130 (2018)

DECISION ON THE MERITS

contention admissibility standard does not contemplate a determination of the merits of a proffered contention; CLI-18-4, 87 NRC 89 (2018)

DEFINITIONS

demand for information is a formal request made to a licensee or applicant to obtain information for the NRC Staff to determine whether an order should be issued to modify, suspend, or revoke the license, or whether to take other enforcement action; DD-18-1, 87 NRC 111 (2018)

in context of export licensing, the term "equivalent facility" refers to a foreign disposal facility that is comparable to a Part 61 disposal facility; CLI-18-2, 87 NRC 78 (2018)

in context of import and export licensing, "radioactive waste" is defined; CLI-18-2, 87 NRC 78 (2018)

in context of import licensing, the term "equivalent facility" refers to an Agreement State-licensed facility; CLI-18-2, 87 NRC 78 (2018)

DEMAND FOR INFORMATION

formal request made to a licensee or applicant to obtain information for the NRC Staff to determine whether an order should be issued to modify, suspend, or revoke the license, or whether to take other enforcement action is considered a demand for information; DD-18-1, 87 NRC 111 (2018)

issuance of a demand for information was not necessary to evaluate the safety-conscious work environment concerns expressed in the 2.206 petition; DD-18-1, 87 NRC 111 (2018)

DEPLETED URANIUM

petitioner's request that NRC reconsider issuance of amendment to source materials license, citing deficiencies in environmental radiation monitoring plan for depleted uranium, is denied; DD-18-2, 87 NRC 163 (2018)

DESIGN

final detailed facility design may be submitted as part of a future operating license application; CLI-18-6, 87 NRC 130 (2018)

methodologies described in standard review plan for fuel cycle facility are an acceptable way to demonstrate adequate safety in design and operation of a radioisotope production facility; CLI-18-6, 87 NRC 130 (2018)

periodic reports regarding design of the criticality accident alarm system must demonstrate sufficient detector coverage to meet the requirements in 10 C.F.R. 70.24(a); CLI-18-6, 87 NRC 130 (2018)

proposed design of medical radioisotope production facility incorporates safety-related and non-safety-related structures, systems, and components that are further categorized based on whether they would be designed to meet the performance requirements for accidents or for normal operations; CLI-18-6, 87 NRC 130 (2018)

See also Reactor Design; Seismic Design

DESIGN CERTIFICATION

combined license application references latest revision of the AP1000 certified reactor design; CLI-18-1, 87 NRC 39 (2018)

departures from a certified design that involve a change to the design as described in the rule certifying the design require an exemption from NRC regulations; CLI-18-1, 87 NRC 39 (2018)

NRC Staff may approve an exemption for a departure from a certified design where it finds that the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption; CLI-18-1, 87 NRC 39 (2018)

NRC Staff must determine that the special circumstances warranting an exemption for a departure from a certified design outweigh any decrease in safety resulting from the reduction in standardization that may result from the exemption; CLI-18-1, 87 NRC 39 (2018)

request for safety analysis of Fukushima accident based on the NRC's plans for a short-term and long-term lessons-learned review was granted and portions of a petition relating to pending design

SUBJECT INDEX

- certification applications, including the AP1000 amendment, were referred to NRC Staff as comments on the design certification rulemakings; CLI-18-1, 87 NRC 39 (2018)
- safety matters resolved at the design certification stage are generally excluded from review of a combined license; CLI-18-1, 87 NRC 39 (2018)
- where a combined license applicant references a certified design, changes to the design may be made in the combined license if proposed as a departure from the certified design, but some departures may be made without prior Commission approval; CLI-18-1, 87 NRC 39 (2018)
- DESIGN CONTROL PROGRAMS**
- licensee must provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternative or simplified calculational methods, or by the performance of a suitable testing program; DD-18-1, 87 NRC 111 (2018)
- DOCUMENTARY MATERIAL**
- document put forth by an intervenor as the basis for a contention is subject to scrutiny both for what it does and does not show; CLI-18-4, 87 NRC 89 (2018)
- DOSE LIMITS**
- criteria for evaluating dose are normally used in calculating dose to the maximally exposed individual for surface water disposals of liquid effluent; CLI-18-1, 87 NRC 39 (2018)
- NRC Staff typically approves requests that will result in a dose to a member of the public that is no more than a few millirem/year; CLI-18-1, 87 NRC 39 (2018)
- DRYWELL**
- contention that license renewal application is deficient for failing to discuss the ASTM standards does not raise a genuine dispute on an issue of material law or fact regarding the adequacy of the LRA's treatment of alkali-silica reaction-induced degradation in licensee's drywell; LBP-18-1, 87 NRC 1 (2018)
- EARLY SITE PERMIT APPLICATION**
- applicant may choose to defer until the combined license stage a discussion of need for power and energy alternatives; CLI-18-5, 87 NRC 119 (2018)
- environmental report may address one or more of the environmental effects of construction and operation of a reactor, or reactors, which have design characteristics that fall within the site characteristics and design parameters for the ESP application; CLI-18-5, 87 NRC 119 (2018)
- spent fuel pool fire analysis is not required at the ESP stage because focus of an ESP is the alternative site analysis and whether there is any obviously superior alternative to the site proposed; CLI-18-5, 87 NRC 119 (2018)
- EFFECTIVENESS**
- a general license is effective without the filing of an application with the Commission or the issuance of licensing documents to a particular person; CLI-18-2, 87 NRC 78 (2018)
- EMERGENCY PLANNING**
- plans must be continually maintained and updated, including accounting for changes in population characteristics; CLI-18-1, 87 NRC 39 (2018)
- ENDANGERED SPECIES**
- all nondiscretionary terms and conditions of the Incidental Take Statement for endangered or threatened species will be incorporated into either the combined licenses issued by NRC or the Department of the Army permit issued by the Corps of Engineers; CLI-18-1, 87 NRC 39 (2018)
- NRC must consult with the Fish and Wildlife Service or the National Marine Fisheries Service, as appropriate, on activities that may affect a listed species or a species proposed to be listed as endangered or threatened; CLI-18-1, 87 NRC 39 (2018)
- ENDANGERED SPECIES ACT**
- agency, in consultation with and with assistance of the Secretary of the Interior or of Commerce, as appropriate, must ensure that any action authorized, funded, or carried out by such an agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of their critical habitat; CLI-18-6, 87 NRC 130 (2018)
- any action authorized by NRC must not jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify the critical habitat of such a species; CLI-18-1, 87 NRC 39 (2018)

SUBJECT INDEX

ENERGY EFFICIENCY

contention alleging that the environmental report failed to consider renewable energy and energy efficiency as alternatives to renewing an operating license fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)

ENFORCEMENT ACTIONS

director of NRC office shall either institute the requested proceeding, take any other action as may be proper, or advise petitioner in writing that no proceeding will be instituted; DD-18-2, 87 NRC 163 (2018)

petition that does not request enforcement action does not meet the criteria for acceptance for review; DD-18-1, 87 NRC 111 (2018)

request for action on deficiencies in the analysis of record for the main steam isolation valve room pressurization following a high-energy line break is granted in part; DD-18-1, 87 NRC 111 (2018)

ENVIRONMENTAL ASSESSMENT

contention challenging applicant's environmental report generally may be viewed by a board as a challenge to NRC Staff's subsequently issued environmental review documents; LBP-18-2, 87 NRC 21 (2018)

ENVIRONMENTAL IMPACT STATEMENT

agencies need only discuss those alternatives that are reasonable and will bring about the ends of the proposed action; LBP-18-1, 87 NRC 1 (2018)

alternatives analysis is the heart of the EIS; CLI-18-1, 87 NRC 39 (2018); CLI-18-6, 87 NRC 130 (2018)
NRC must weigh unavoidable adverse environmental impacts and resource commitments (environmental costs) of the project against the project's benefits; CLI-18-1, 87 NRC 39 (2018)

NRC Staff must assess the relationship between local short-term uses and long-term productivity of the environment, consider alternatives, and describe unavoidable adverse environmental impacts and the irreversible and irretrievable commitments of resources associated with the proposed action; CLI-18-6, 87 NRC 130 (2018)

NRC Staff must not include a discussion of need for power or energy alternatives if they are not addressed in the environmental report; CLI-18-5, 87 NRC 119 (2018)

ENVIRONMENTAL ISSUES

findings that NRC must make to support issuance of a construction permit for a commercial medical radioisotope production facility are described; CLI-18-6, 87 NRC 130 (2018)

matters that must be determined in the combined license mandatory hearing are outlined in 10 C.F.R. 51.107(a); CLI-18-1, 87 NRC 39 (2018)

ENVIRONMENTAL REPORT

contention alleging that the ER failed to consider renewable energy and energy efficiency as alternatives to renewing an operating license fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)

contention challenging applicant's ER generally may be viewed by a board as a challenge to NRC Staff's subsequently issued environmental review documents; LBP-18-2, 87 NRC 21 (2018)

contention that applicant's ER does not properly and adequately state a purpose and need for relicensing fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)

early site permit application may address one or more of the environmental effects of construction and operation of a reactor, or reactors, which have design characteristics that fall within the site characteristics and design parameters; CLI-18-5, 87 NRC 119 (2018)

failure to file contentions based on applicant's ER could result in dismissal of the contention as impermissibly late; CLI-18-5, 87 NRC 119 (2018)

identification of an omission in the ER and demonstration that spent fuel pool accident consequences either must be considered or shown to be remote and speculative to satisfy the NRC's obligations under NEPA is sufficient for an admissible contention of omission; CLI-18-5, 87 NRC 119 (2018)

NEPA requires an ER to address the environmental impacts of the proposed action and compare them to impacts of reasonable alternatives to the proposed action; LBP-18-1, 87 NRC 1 (2018)

ENVIRONMENTAL REVIEW

agencies are required to use a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in decisionmaking that may impact the environment; CLI-18-1, 87 NRC 39 (2018); CLI-18-6, 87 NRC 130 (2018)

SUBJECT INDEX

NRC Staff must weigh unavoidable adverse environmental impacts and resource commitments (environmental costs) against the project's benefits; CLI-18-6, 87 NRC 130 (2018)
to ensure that NRC's obligations are fulfilled for a construction permit proceeding for a commercial medical radioisotope production facility, NRC must determine whether the NEPA review conducted by NRC Staff has been adequate; CLI-18-6, 87 NRC 130 (2018)

EVIDENCE

boards will not hunt for evidence that the draft environmental assessment is not substantially similar to the environmental report, plumb the record for arguments that there is a reasonable basis to conclude that the new information adequately addresses the deficits, or generally do counsels' work for them; LBP-18-2, 87 NRC 21 (2018)
petitioner has an obligation not just to refer generally to voluminous documents, but to provide analysis and supporting evidence as to why particular sections of those documents provide a basis for a contention; LBP-18-2, 87 NRC 21 (2018)

EXCEPTIONS

two exceptions to the general license would require an importer to seek a specific license; CLI-18-2, 87 NRC 78 (2018)

EXEMPTIONS

departures from a certified design that involve a change to the design as described in the rule certifying the design require an exemption from NRC regulations; CLI-18-1, 87 NRC 39 (2018)
exemption from certain combined license application organization and numbering requirements was requested in order to be consistent with NRC guidance in Regulatory Guide 1.206 and NUREG-0800; CLI-18-1, 87 NRC 39 (2018)
if target fabrication will not affect the quality of the environment after weighing the environmental, economic, technical and other benefits against environmental costs and considering available alternatives, exemption from 10 C.F.R. 70.23(a)(7) will be granted; CLI-18-6, 87 NRC 130 (2018)
NRC Staff designated the Levy County combined license application as a "reference" application for five common departures and exemptions; CLI-18-1, 87 NRC 39 (2018)
NRC Staff may approve an exemption for a departure from a certified design where it finds that the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption; CLI-18-1, 87 NRC 39 (2018)
NRC Staff must determine that the special circumstances warranting an exemption for a departure from a certified design outweigh any decrease in safety resulting from the reduction in standardization that may result from the exemption; CLI-18-1, 87 NRC 39 (2018)
requirements that combined license applicants must meet to obtain an exemption from NRC regulations are found in 10 C.F.R. 52.93; CLI-18-1, 87 NRC 39 (2018)

EXPORT LICENSES

for both exports and imports, the purpose of the phrase "equivalent facility" is to ensure the linkage between import and export licensing and domestic licensing by requiring a specific import or export license only when applicant intends to dispose of material in a radioactive waste site rather than a hazardous waste site; CLI-18-2, 87 NRC 78 (2018)
hearing request must specify, when a person asserts that his interest may be affected, both the facts pertaining to his interest and how it may be affected; CLI-18-2, 87 NRC 78 (2018)
if an export license hearing request or intervention petition asserts an interest that may be affected, the Commission will consider nature of the alleged interest, how that issue relates to issuance or denial, and possible effect of any order on that interest; CLI-18-2, 87 NRC 78 (2018)
in context of export license, "equivalent facility" refers to a foreign disposal facility that is comparable to a Part 61 disposal facility; CLI-18-2, 87 NRC 78 (2018)
in context of import and export licensing, "radioactive waste" is defined; CLI-18-2, 87 NRC 78 (2018)
intervention standards in 10 C.F.R. Part 2, Subpart C do not apply to export and import license proceedings; CLI-18-2, 87 NRC 78 (2018)
persons without an affected interest in an export license proceeding are not as likely as persons with an affected interest to contribute to NRC decisionmaking by showing that a hearing would be in the public interest and assisting in making the statutory determinations; CLI-18-2, 87 NRC 78 (2018)

SUBJECT INDEX

petitioner must show how a hearing on an export license would bring new information to light; CLI-18-2, 87 NRC 78 (2018)

public participation in licensing proceedings is allowed only when such participation will be in the public interest and will assist the Commission in making the statutory determinations required by the Atomic Energy Act; CLI-18-2, 87 NRC 78 (2018)

where petitioners have already submitted detailed information as to the basis for their position, the Commission does not believe a hearing will result in significant new information that is not already available to and considered by the Commission in making the requisite statutory determinations; CLI-18-2, 87 NRC 78 (2018)

FAIRNESS

every participant must fulfill the obligations imposed by and in accordance with applicable law and NRC regulations; CLI-18-4, 87 NRC 89 (2018)

FIRES

identification of an omission in the environmental report and demonstration that spent fuel pool accident consequences either must be considered or shown to be remote and speculative to satisfy the NRC's obligations under NEPA is sufficient for an admissible contention of omission; CLI-18-5, 87 NRC 119 (2018)

spent fuel pool fire analysis is not required at the early site permit stage because focus of an early site permit is the alternative site analysis and whether there is any obviously superior alternative to the site proposed; CLI-18-5, 87 NRC 119 (2018)

FUKUSHIMA ACCIDENT

request for safety analysis of the accident based on the NRC's plans for a short-term and long-term lessons-learned review was granted and portions of a petition relating to pending design certification applications, including the AP1000 amendment, were referred to NRC Staff as comments on the design certification rulemakings; CLI-18-1, 87 NRC 39 (2018)

GENERAL LICENSES

license does not authorize the import of radioactive waste in any quantity; CLI-18-2, 87 NRC 78 (2018)

license is effective without the filing of an application with NRC or issuance of licensing documents to a particular person; CLI-18-2, 87 NRC 78 (2018)

license limits import of source and/or special nuclear material to no more than 100 kilograms per shipment; CLI-18-2, 87 NRC 78 (2018)

license may be granted to any person for the import of byproduct, source, or special nuclear material if the U.S. consignee is authorized to receive and possess the material under the relevant NRC or Agreement State regulations; CLI-18-2, 87 NRC 78 (2018)

two exceptions to the general license would require an importer to seek a specific license; CLI-18-2, 87 NRC 78 (2018)

HEARING REQUESTS

petitioner must set forth with particularity the contentions sought to be raised; CLI-18-4, 87 NRC 89 (2018)

See also Abeyance of Hearing Request

HYDROGEOLOGY

migration of contention that applicant fails to include adequate hydrogeological information to demonstrate ability to contain fluid migration is decided; LBP-18-2, 87 NRC 21 (2018)

IMPORT LICENSES

for both exports and imports, purpose of the phrase "equivalent facility" is to ensure the linkage between import and export licensing and domestic licensing by requiring a specific import or export license only when applicant intends to dispose of material in a radioactive waste site rather than a hazardous waste site; CLI-18-2, 87 NRC 78 (2018)

general license does not authorize import of more than 100 kilograms per shipment of source and/or special nuclear material; CLI-18-2, 87 NRC 78 (2018)

general license does not authorize import of radioactive waste in any quantity; CLI-18-2, 87 NRC 78 (2018)

general license may be granted to any person for the import of byproduct, source, or special nuclear material if the U.S. consignee is authorized to receive and possess the material under the relevant NRC or Agreement State regulations; CLI-18-2, 87 NRC 78 (2018)

SUBJECT INDEX

- in context of import and export licensing, “radioactive waste” is defined; CLI-18-2, 87 NRC 78 (2018)
- in import context, the term “equivalent facility” refers to an Agreement State-licensed facility; CLI-18-2, 87 NRC 78 (2018)
- intervention standards in 10 C.F.R. Part 2, Subpart C do not apply to export and import license proceedings; CLI-18-2, 87 NRC 78 (2018)
- two exceptions to the general license would require an importer to seek a specific license; CLI-18-2, 87 NRC 78 (2018)
- IN SITU LEACH MINING**
 - migration of contention that materials license amendment application fails to provide sufficient information to establish potential effects of the project on the adjacent surface water and groundwater resources is decided; LBP-18-2, 87 NRC 21 (2018)
- INCORPORATION BY REFERENCE**
 - applicants frequently incorporate by reference certain material in NRC proceedings; CLI-18-2, 87 NRC 78 (2018)
- INFORMATION NOTICE**
 - reliance solely on and Information Notice to support a contention is insufficient support; LBP-18-1, 87 NRC 1 (2018)
- INJURY IN FACT**
 - contemporaneous judicial concepts of standing require petitioner to allege an injury in fact that is fairly traceable to the challenged action and is likely to be redressed by a favorable decision; LBP-18-1, 87 NRC 1 (2018)
- INTEREST**
 - export license hearing request must specify, when a person asserts that his interest may be affected, both the facts pertaining to his interest and how it may be affected; CLI-18-2, 87 NRC 78 (2018)
 - persons without an affected interest in an export license proceeding are not as likely as persons with an affected interest to contribute to NRC decisionmaking by showing that a hearing would be in the public interest and assisting in making the statutory determinations; CLI-18-2, 87 NRC 78 (2018)
- INTERESTED GOVERNMENTAL ENTITY**
 - city was granted right to participate as an interested local government after admission of its contentions was denied; CLI-18-1, 87 NRC 39 (2018)
- INTERPRETATION**
 - board is allowed to reasonably interpret a pro se petitioner’s arguments; CLI-18-4, 87 NRC 89 (2018)
- INTERVENTION**
 - petitioner must demonstrate standing and raise at least one admissible contention that meets the six-factor test; CLI-18-5, 87 NRC 119 (2018); LBP-18-1, 87 NRC 1 (2018)
 - public participation in export licensing proceedings is allowed only when such participation will be in the public interest and will assist the Commission in making the statutory determinations required by the Atomic Energy Act; CLI-18-2, 87 NRC 78 (2018)
 - standards in 10 C.F.R. Part 2, Subpart C do not apply to export and import license proceedings; CLI-18-2, 87 NRC 78 (2018)
- INTERVENTION PETITIONS**
 - challenged material must bear a sufficient nexus to the facts and arguments in the initial petition and answers to warrant being included in the reply; LBP-18-1, 87 NRC 1 (2018)
 - export license hearing request must specify, when a person asserts that his interest may be affected, both the facts pertaining to his interest and how it may be affected; CLI-18-2, 87 NRC 78 (2018)
 - petitioner must show how a hearing on an export license would bring new information to light; CLI-18-2, 87 NRC 78 (2018)
 - petitioner, not the board, must provide the information required to satisfy contention admissibility standards; CLI-18-4, 87 NRC 89 (2018)
- INTERVENTION RULINGS**
 - appeal as of right on the question whether a petition to intervene should have been wholly denied is allowed; CLI-18-4, 87 NRC 89 (2018)
 - board acted within its authority to consider intervention petition as a whole and to reformulate contentions for clarity, succinctness, and efficiency; CLI-18-4, 87 NRC 89 (2018)

SUBJECT INDEX

board's contention admissibility decision was reversed on the ground that the board improperly provided the nexus between proposed contentions and the application, and itself supplied support for those contentions; CLI-18-4, 87 NRC 89 (2018)

Commission defers to a board's contention admissibility rulings unless the appeal points to an error of law or abuse of discretion; CLI-18-4, 87 NRC 89 (2018); CLI-18-5, 87 NRC 119 (2018)

if an export license hearing request or intervention petition asserts an interest that may be affected, the Commission will consider nature of the alleged interest, how that issue relates to issuance or denial, and possible effect of any order on that interest; CLI-18-2, 87 NRC 78 (2018)

licensing board has an independent obligation to determine whether a petitioner satisfies standing requirements, even if there is no challenge; LBP-18-1, 87 NRC 1 (2018)

party other than petitioner has a right to appeal on the question whether a petition to intervene should have been wholly denied; CLI-18-5, 87 NRC 119 (2018)

where petitioners have already submitted detailed information as to the basis for their position, the Commission does not believe a hearing will result in significant new information that is not already available to and considered by the Commission in making the requisite statutory determinations; CLI-18-2, 87 NRC 78 (2018)

LICENSE APPLICATIONS

applicants frequently incorporate by reference certain material in NRC filings; CLI-18-2, 87 NRC 78 (2018)

See also Combined License Application; Early Site Permit Application; Operating License Applications

LICENSE TRANSFER PROCEEDINGS

in light of Settlement Agreement and petitioners' notices of anticipated withdrawal, motion to hold in abeyance petition for leave to intervene and request for hearing is granted pending further notification from petitioners or applicants or further Commission order; CLI-18-3, 87 NRC 87 (2018)

LICENSING BOARDS

boards will not hunt for evidence that the draft environmental assessment is not substantially similar to the environmental report, plumb the record for arguments that there is a reasonable basis to conclude that the new information adequately addresses the deficits, or generally do counsels' work for them; LBP-18-2, 87 NRC 21 (2018)

LICENSING BOARDS, AUTHORITY

board acted within its authority to consider intervention petition as a whole and to reformulate contentions for clarity, succinctness, and efficiency; CLI-18-4, 87 NRC 89 (2018)

board is allowed to reasonably interpret a pro se petitioner's arguments; CLI-18-4, 87 NRC 89 (2018)

in appropriate circumstances, a board may define the scope of a contention in light of the foundational support that leads to its admission; LBP-18-2, 87 NRC 21 (2018)

in determining contention admissibility, licensing board has authority to reformulate contentions to eliminate extraneous issues or to consolidate issues for a more efficient proceeding; CLI-18-4, 87 NRC 89 (2018)

key limitation of the board's reformulation authority is that the board may not provide new or missing information to render a contention admissible; CLI-18-4, 87 NRC 89 (2018)

licensing board may consider the readily apparent legal implications of a pro se petitioner's arguments, even if not expressly stated in the petition; CLI-18-4, 87 NRC 89 (2018)

licensing boards are allowed some latitude with respect to pro se petitioners; CLI-18-4, 87 NRC 89 (2018)

MAIN STEAM ISOLATION VALVES

failure to identify design deficiencies involving secondary missiles from the safety-related main steam safety valve room pressurization is a non-cited violation; DD-18-1, 87 NRC 111 (2018)

request for action on deficiencies in the analysis of record for the main steam isolation valve room pressurization following a high-energy line break is granted in part; DD-18-1, 87 NRC 111 (2018)

MAINTENANCE PROGRAMS

board excluded petitioner's claim that monitoring intervals are too fixed on the grounds that this claim constituted an impermissible challenge to the maintenance rule; CLI-18-4, 87 NRC 89 (2018)

SUBJECT INDEX

MANDATORY HEARINGS

all safety and environmental matters relevant to a combined license application, except those resolved in the contested proceeding, are subject to review in the uncontested proceeding; CLI-18-1, 87 NRC 39 (2018)

combined license application is not reviewed de novo, but rather, the inquiry is whether NRC Staff's review was sufficient to support its findings; CLI-18-1, 87 NRC 39 (2018)

Commission considers whether NRC Staff review of the application has been adequate to support the findings set forth in the governing regulations; CLI-18-1, 87 NRC 39 (2018)

Commission does not review construction permit application de novo, but rather determines whether NRC Staff's review was sufficient to support the required findings; CLI-18-6, 87 NRC 130 (2018)

Commission must hold a hearing, after 30 days' notice and publication in the Federal Register, on each application under AEA section 103 or 104b for a construction permit for a facility, and on any application under AEA section 104c for a construction permit for a testing facility; CLI-18-6, 87 NRC 130 (2018)

environmental matters that must be must addressed in the combined license hearing are outlined in 10 C.F.R. 51.107(a); CLI-18-1, 87 NRC 39 (2018)

NRC must hold a hearing on each application to construct a nuclear power plant, regardless of whether an interested member of the public requests a hearing on the application; CLI-18-1, 87 NRC 39 (2018)

safety matters that must be must addressed in the combined license hearing are outlined in 10 C.F.R. 52.97(a)(1); CLI-18-1, 87 NRC 39 (2018)

MATERIALS LICENSE AMENDMENT PROCEEDINGS

migration of contention that materials license amendment application fails to provide sufficient information to establish potential effects of the project on the adjacent surface water and groundwater resources is decided; LBP-18-2, 87 NRC 21 (2018)

MATERIALS LICENSES

medical radioisotope production facility will need to apply for and obtain an operating license as well as a license to receive, possess, and use special nuclear material in its operations, including the proposed target fabrication process; CLI-18-6, 87 NRC 130 (2018)

See also Byproduct Materials Licenses

MEDICAL RADIOISOTOPE PRODUCTION FACILITY

accident analysis methodology for facility is discussed; CLI-18-6, 87 NRC 130 (2018)

application of radiological and chemical consequence and likelihood criteria in accident analysis for radioisotope production facility is acceptable; CLI-18-6, 87 NRC 130 (2018)

criteria of Part 100 do not expressly apply to these facilities; CLI-18-6, 87 NRC 130 (2018)

environmental findings that NRC must make to support issuance of a construction permit for the facility are described; CLI-18-6, 87 NRC 130 (2018)

exemption from 10 C.F.R. 70.23(a)(7) will be granted if target fabrication will not affect the quality of the environment after weighing the environmental, economic, technical, and other benefits against environmental costs and considering available alternatives; CLI-18-6, 87 NRC 130 (2018)

final detailed facility design may be submitted as part of a future operating license application; CLI-18-6, 87 NRC 130 (2018)

findings for issuance of a construction permit require that site criteria in 10 C.F.R. Part 100 be considered to ensure that the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public; CLI-18-6, 87 NRC 130 (2018)

in making its findings on a construction permit, the Commission is guided by the additional considerations in 10 C.F.R. 50.40(a)-(d); CLI-18-6, 87 NRC 130 (2018)

items relied on for safety are engineered or administrative controls or control systems that are applied to reduce the likelihood of an accident such that the event either becomes highly unlikely or its consequences are reduced to meet the performance requirements in 10 C.F.R. 70.61(b)-(e); CLI-18-6, 87 NRC 130 (2018)

licensee will need to apply for and obtain a byproduct material license to process and ship molybdenum-99; CLI-18-6, 87 NRC 130 (2018)

licensee will need to apply for and obtain an operating license as well as a license to receive, possess, and use special nuclear material in its operations, including the proposed target fabrication process; CLI-18-6, 87 NRC 130 (2018)

SUBJECT INDEX

methodologies described in standard review plan for fuel cycle facility are an acceptable way to demonstrate adequate safety in design and operation of a radioisotope production facility; CLI-18-6, 87 NRC 130 (2018)

NRC Staff must weigh unavoidable adverse environmental impacts and resource commitments (environmental costs) of the project against the project's benefits; CLI-18-6, 87 NRC 130 (2018)

NRC will issue a construction permit in such form and containing such conditions and limitations that it deems appropriate and necessary; CLI-18-6, 87 NRC 130 (2018)

periodic reports regarding design of the criticality accident alarm system must demonstrate sufficient detector coverage to meet the requirements in 10 C.F.R. 70.24(a); CLI-18-6, 87 NRC 130 (2018)

proposed design incorporates safety-related and non-safety-related structures, systems, and components that are further categorized based on whether they would be designed to meet the performance requirements for accidents or for normal operations; CLI-18-6, 87 NRC 130 (2018)

safety determinations that NRC must make to allow construction of a commercial facility are described; CLI-18-6, 87 NRC 130 (2018)

to ensure that NRC's obligations are fulfilled for a construction permit proceeding, NRC must determine whether the NEPA review conducted by NRC Staff has been adequate; CLI-18-6, 87 NRC 130 (2018)

MIGRATION TENET

basic form of a contention may not be changed from a contention of omission to one of adequacy; LBP-18-2, 87 NRC 21 (2018)

boards need only permit migration of an admitted contention where information in NRC Staff's environmental review document is sufficiently similar to material in applicant's environmental report; LBP-18-2, 87 NRC 21 (2018)

consideration must be given to case law that distinguishes between a contention of omission and a contention of adequacy; LBP-18-2, 87 NRC 21 (2018)

contention challenging applicant's environmental report generally may be viewed by a board as a challenge to NRC Staff's subsequently issued environmental review documents; LBP-18-2, 87 NRC 21 (2018)

contention's sponsor may choose not to make any submission regarding an admitted ER-based environmental contention that it believes will properly migrate and can simply await an applicant or Staff filing challenging the contention's continued viability in light of the Staff's environmental document; LBP-18-2, 87 NRC 21 (2018)

failure to submit a contention migration declaration is not, in and of itself, a reason for a board to refuse to allow the environmental portion of a contention to migrate as a challenge to NRC Staff's draft environmental assessment; LBP-18-2, 87 NRC 21 (2018)

issuance of NRC Staff's safety evaluation report does not trigger the migration tenet; LBP-18-2, 87 NRC 21 (2018)

migration of contention that applicant fails to include adequate hydrogeological information to demonstrate ability to contain fluid migration is decided; LBP-18-2, 87 NRC 21 (2018)

motion to deny contention migration must state with particularity the grounds upon which relief is sought and be accompanied by any affidavits or other evidence relied on; LBP-18-2, 87 NRC 21 (2018)

movant challenging contention migration has the burden of proof to show that it should not be permitted; LBP-18-2, 87 NRC 21 (2018)

previously admitted contention challenging applicant's environmental report may be construed as a challenge to a later-issued NRC Staff environmental review document without requiring the contention's proponent to file a new or amended contention; LBP-18-2, 87 NRC 21 (2018)

proponent of a contention is not required to resubmit the contention if it maintains that the contention will properly migrate; LBP-18-2, 87 NRC 21 (2018)

MOLYBDENUM-99

medical radioisotope production facility will need to apply for and obtain a byproduct material license to process and ship molybdenum-99; CLI-18-6, 87 NRC 130 (2018)

MONITORING

licensees are required to monitor performance or condition of structures, systems, or components against licensee-established goals, in a manner sufficient to provide reasonable assurance that these SSCs are capable of fulfilling their intended functions; CLI-18-4, 87 NRC 89 (2018)

See also Radiation Monitoring System

SUBJECT INDEX

MOTIONS

proponent has the burden of proof; LBP-18-2, 87 NRC 21 (2018)

NATIONAL ENVIRONMENTAL POLICY ACT

agencies are required to use a systematic, interdisciplinary approach that will insure integrated use of natural and social sciences and environmental design arts in decisionmaking that may impact the environment; CLI-18-1, 87 NRC 39 (2018); CLI-18-6, 87 NRC 130 (2018)

agencies must study, develop, and describe appropriate alternatives to proposed actions; CLI-18-1, 87 NRC 39 (2018); CLI-18-6, 87 NRC 130 (2018)

consideration of alternatives that are only remote and speculative possibilities is not required; LBP-18-1, 87 NRC 1 (2018)

environmental impact statement must assess the relationship between local short-term uses and long-term productivity of the environment, consider alternatives, and describe unavoidable adverse environmental impacts and the irreversible and irretrievable commitments of resources associated with the proposed action; CLI-18-1, 87 NRC 39 (2018); CLI-18-6, 87 NRC 130 (2018)

environmental report must address the environmental impacts of the proposed action and compare them to impacts of reasonable alternatives to the proposed action; LBP-18-1, 87 NRC 1 (2018)

NRC is required to address the environmental consequences of spent fuel pool accidents unless they could be found to be remote and speculative; CLI-18-5, 87 NRC 119 (2018)

NRC is required to consider the impacts of its actions on environmental values; CLI-18-6, 87 NRC 130 (2018)

NEED FOR POWER

early site permit applicant may choose to defer until the combined license stage a discussion of need for power and energy alternatives; CLI-18-5, 87 NRC 119 (2018)

NRC Staff must not include a discussion of need for power or energy alternatives if they are not addressed in the environmental report; CLI-18-5, 87 NRC 119 (2018)

NRC GUIDANCE DOCUMENTS

methodologies described in standard review plan for fuel cycle facility are an acceptable way to demonstrate adequate safety in design and operation of a radioisotope production facility; CLI-18-6, 87 NRC 130 (2018)

NRC STAFF REVIEW

combined license application is not reviewed de novo in the mandatory hearing but rather, the inquiry is whether NRC Staff's review was sufficient to support its findings; CLI-18-1, 87 NRC 39 (2018)

in determining reactor site acceptability, NRC Staff evaluates physical characteristics of the site, with particular focus on security and emergency plans and measures that ensure the public health and safety; CLI-18-1, 87 NRC 39 (2018)

in uncontested mandatory proceeding, Commission considers whether NRC Staff review of the application has been adequate to support the findings set forth in the governing regulations; CLI-18-1, 87 NRC 39 (2018)

NRC Staff must weigh unavoidable adverse environmental impacts and resource commitments (environmental costs) of the project against the project's benefits; CLI-18-6, 87 NRC 130 (2018)

Staff must determine that the special circumstances warranting an exemption for a departure from a certified design outweigh any decrease in safety resulting from the reduction in standardization that may result from the exemption; CLI-18-1, 87 NRC 39 (2018)

to ensure that NRC's obligations are fulfilled for a construction permit proceeding for a commercial medical radioisotope production facility, NRC must determine whether the NEPA review conducted by NRC Staff has been adequate; CLI-18-6, 87 NRC 130 (2018)

NUCLEAR POWER PLANTS

in determining reactor site acceptability, NRC Staff evaluates physical characteristics of the site, with particular focus on security and emergency plans and measures that ensure the public health and safety; CLI-18-1, 87 NRC 39 (2018)

reactor sites in areas of low population density are generally preferred, but a particular site not in an area of low density but located away from a high-density population may still be acceptable; CLI-18-1, 87 NRC 39 (2018)

reactor sites should be located away from very densely populated centers; CLI-18-1, 87 NRC 39 (2018)

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NUCLEAR REGULATORY COMMISSION, AUTHORITY

NRC will issue a construction permit in such form and containing such conditions and limitations that it deems appropriate and necessary; CLI-18-6, 87 NRC 130 (2018)

OPERATING LICENSE APPLICATIONS

final detailed facility design may be submitted as part of a future operating license application; CLI-18-6, 87 NRC 130 (2018)

OPERATING LICENSE RENEWAL

license renewal applicant's use of an aging management program identified in the GALL Report constitutes reasonable assurance that it will manage the targeted aging effect during the renewal period; LBP-18-1, 87 NRC 1 (2018)

reasonable alternative energy source considered in the application should be commercially viable and technically capable of producing the required baseload power in the region of interest by the expiration date of the license; LBP-18-1, 87 NRC 1 (2018)

OPERATING LICENSE RENEWAL PROCEEDINGS

contention alleging that license renewal application does not undertake an adequate aging management review of the concrete on the containment vessel fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)

contention that applicant's environmental report does not properly and adequately state a purpose and need for relicensing fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)

proximity presumption is applicable; LBP-18-1, 87 NRC 1 (2018)

OPERATING LICENSES

medical radioisotope production facility will need to apply for and obtain an operating license as well as a license to receive, possess, and use special nuclear material in its operations, including the proposed target fabrication process; CLI-18-6, 87 NRC 130 (2018)

OVERPRESSURIZATION

request for action on deficiencies in the analysis of record for the main steam isolation valve room pressurization following a high-energy line break is granted in part; DD-18-1, 87 NRC 111 (2018)

PERMITS

See Construction Permits; Early Site Permit Application

PLEADINGS

document put forth as basis for a contention is subject to scrutiny both for what it does and does not show; CLI-18-4, 87 NRC 89 (2018)

fairness to all involved in NRC's adjudicatory procedures requires that every participant fulfill the obligations imposed by and in accordance with applicable law and Commission regulations; CLI-18-4, 87 NRC 89 (2018)

neither the Commission nor the board is obliged to look through lengthy documents for information on which a litigant relies; LBP-18-2, 87 NRC 21 (2018)

petitioner has an obligation not just to refer generally to voluminous documents, but to provide analysis and supporting evidence as to why particular sections of those documents provide a basis for a contention; LBP-18-2, 87 NRC 21 (2018)

POPULATION DENSITY

emergency plans must be continually maintained and updated, including accounting for changes in population characteristics; CLI-18-1, 87 NRC 39 (2018)

reactor sites in areas of low population density are generally preferred, but a particular site not in an area of low density but located away from a high-density population may still be acceptable; CLI-18-1, 87 NRC 39 (2018)

reactor sites should be located away from very densely populated centers; CLI-18-1, 87 NRC 39 (2018)

PRO SE LITIGANTS

board is allowed to reasonably interpret a pro se petitioner's arguments; CLI-18-4, 87 NRC 89 (2018)

licensing board may consider the readily apparent legal implications of a pro se petitioner's arguments, even if not expressly stated in the petition; CLI-18-4, 87 NRC 89 (2018)

licensing boards are allowed some latitude with respect to pro se petitioners; CLI-18-4, 87 NRC 89 (2018)

petitioners not represented by counsel are not held to the same standards as parties represented by counsel; CLI-18-4, 87 NRC 89 (2018)

SUBJECT INDEX

PROBABILISTIC RISK ASSESSMENT

application of radiological and chemical consequence and likelihood criteria in accident analysis for radioisotope production facility is acceptable; CLI-18-6, 87 NRC 130 (2018)

PROXIMITY PRESUMPTION

50-mile proximity presumption is simply a shortcut for determining standing in certain cases; LBP-18-1, 87 NRC 1 (2018)

petitioner is presumed to have standing to intervene if petitioner lives within approximately 50 miles of the facility in question; LBP-18-1, 87 NRC 1 (2018)

standing based on proximity was applied in a reactor license renewal proceeding; LBP-18-1, 87 NRC 1 (2018)

standing rests on the finding that persons living within the roughly 50-mile radius of a facility face a realistic threat of harm if a release from the facility of radioactive material were to occur; LBP-18-1, 87 NRC 1 (2018)

QUALITY ASSURANCE

measures must be established to ensure that conditions adverse to quality, such as nonconformances, are promptly identified and corrected; DD-18-1, 87 NRC 111 (2018)

RADIATION MONITORING SYSTEM

petitioner's request that NRC reconsider issuance of amendment to source materials license, citing deficiencies in environmental radiation monitoring plan for depleted uranium, is denied; DD-18-2, 87 NRC 163 (2018)

RADIOACTIVE WASTE

general license does not authorize the import of radioactive waste in any quantity; CLI-18-2, 87 NRC 78 (2018)

in context of import and export licensing, "radioactive waste" is defined; CLI-18-2, 87 NRC 78 (2018) to the extent that petitioners seek to waive Part 110's definition of radioactive waste so that applicant would need a specific import license, Commission finds that petitioners have not shown that the definition of "radioactive waste" fails to serve the purposes for which it was adopted; CLI-18-2, 87 NRC 78 (2018)

RADIOACTIVE WASTE DISPOSAL

applicant seeking approval of an alternative waste disposal procedure must include a description of the waste, proposed manner and conditions of disposal, analysis of the nature of the environment, nature and location of other potentially affected facilities, analyses and procedures to ensure that doses are maintained as low as is reasonably achievable and within the dose limits of Part 20; CLI-18-1, 87 NRC 39 (2018)

approach to disposal of liquid radioactive waste must meet the requirements of 10 C.F.R. 20.2002; CLI-18-1, 87 NRC 39 (2018)

criteria for evaluating dose are normally used in calculating dose to the maximally exposed individual for surface water disposals of liquid effluent; CLI-18-1, 87 NRC 39 (2018)

design of the liquid waste management system must satisfy the requirements of 10 C.F.R. 20.1301(e), 20.1302, 50.34a, and Part 50, Appendix A, GDC 60 and 61; CLI-18-1, 87 NRC 39 (2018)

for both exports and imports, the purpose of the phrase "equivalent facility" is to ensure the linkage between import and export licensing and domestic licensing by requiring a specific import or export license only when the applicant intends to dispose of the material in a radioactive waste site rather than a hazardous waste site; CLI-18-2, 87 NRC 78 (2018)

NRC Staff typically approves requests that will result in a dose to a member of the public that is no more than a few millirem/year; CLI-18-1, 87 NRC 39 (2018)

RADIOLOGICAL EXPOSURE

criteria for evaluating dose are normally used in calculating dose to the maximally exposed individual for surface water disposals of liquid effluent; CLI-18-1, 87 NRC 39 (2018)

REACTOR DESIGN

combined license application references latest revision of the AP1000 certified reactor design; CLI-18-1, 87 NRC 39 (2018)

departures from a certified design that involve a change to the design as described in the rule certifying the design require an exemption from NRC regulations; CLI-18-1, 87 NRC 39 (2018)

SUBJECT INDEX

- NRC Staff designated the Levy County combined license application as a “reference” application for five common departures and exemptions; CLI-18-1, 87 NRC 39 (2018)
- NRC Staff may approve an exemption for a departure from a certified design where it finds that the exemption is authorized by law, will not present undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption; CLI-18-1, 87 NRC 39 (2018)
- NRC Staff must determine that the special circumstances warranting an exemption for a departure from a certified design outweigh any decrease in safety resulting from the reduction in standardization that may result from the exemption; CLI-18-1, 87 NRC 39 (2018)
- request for safety analysis of Fukushima accident based on the NRC’s plans for a short-term and long-term lessons-learned review was granted and portions of a petition relating to pending design certification applications, including the AP1000 amendment, were referred to NRC Staff as comments on the design certification rulemakings; CLI-18-1, 87 NRC 39 (2018)
- where a combined license applicant references a certified design, changes to the design may be made in the combined license if proposed as a departure from the certified design, but some departures may be made without prior Commission approval; CLI-18-1, 87 NRC 39 (2018)
- REASONABLE ASSURANCE**
- license renewal applicant’s use of an aging management program identified in the GALL Report constitutes reasonable assurance that it will manage the targeted aging effect during the renewal period; LBP-18-1, 87 NRC 1 (2018)
- REGULATIONS**
- NRC rules are not subject to collateral attack during adjudicatory proceedings; CLI-18-2, 87 NRC 78 (2018)
- REGULATIONS, INTERPRETATION**
- criteria of Part 100 do not expressly apply to radioisotope production facilities; CLI-18-6, 87 NRC 130 (2018)
- RENEWABLE ENERGY SOURCES**
- at contention admissibility stage, petitioner bears the burden of providing some minimal factual support or expert opinion sufficient to demonstrate a genuine dispute as to whether an alternative energy source or a combination of sources can meet that standard; LBP-18-1, 87 NRC 1 (2018)
- contention alleging that the environmental report failed to consider renewable energy and energy efficiency as alternatives to renewing an operating license fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)
- Federal Energy Regulatory Commission has recently adopted policies that promote the expansion of the transmission grid; LBP-18-1, 87 NRC 1 (2018)
- for an alternative energy source to be deemed reasonable, it must be a current or impending reality in the region of interest; LBP-18-1, 87 NRC 1 (2018)
- mere potential for or theoretical capacity of renewable energy and energy efficiency in lieu of nuclear power is insufficient to show their commercial viability as sources of baseload power in the region of interest by the expiration date of the license; LBP-18-1, 87 NRC 1 (2018)
- REPLY BRIEFS**
- challenged material must bear a sufficient nexus to the facts and arguments in the initial petition and answers to warrant being included in the reply; LBP-18-1, 87 NRC 1 (2018)
- REPORTING REQUIREMENTS**
- periodic reports regarding design of the criticality accident alarm system must demonstrate sufficient detector coverage to meet the requirements in 10 C.F.R. 70.24(a); CLI-18-6, 87 NRC 130 (2018)
- REQUEST FOR ACTION**
- director of NRC office shall either institute the requested proceeding, take any other action as may be proper, or advise petitioner in writing that no proceeding will be instituted; DD-18-2, 87 NRC 163 (2018)
- petition that does not request enforcement action does not meet the criteria for acceptance for review; DD-18-1, 87 NRC 111 (2018)
- petitioner’s request that NRC reconsider issuance of amendment to source materials license, citing deficiencies in environmental radiation monitoring plan for depleted uranium, is denied; DD-18-2, 87 NRC 163 (2018)

SUBJECT INDEX

REVERSAL OF RULING

board's contention admissibility decision was reversed on the ground that the board improperly provided the nexus between proposed contentions and the application, and itself supplied support for those contentions; CLI-18-4, 87 NRC 89 (2018)

REVIEW

See Appellate Review; Environmental Review; NRC Staff Review; Standard of Review; Standard Review Plans

RULEMAKING

board's rejection of a hearing request in which requester sought a hearing on an individual licensing action on the ground that NRC Staff had constructively denied its pending rulemaking petition was affirmed; CLI-18-4, 87 NRC 89 (2018)

licensing board should not accept in individual license proceedings contentions that are or are about to become the subject of general rulemaking by the Commission; CLI-18-4, 87 NRC 89 (2018)

rule prohibiting litigation of matters that are or are about to become subject to rulemaking does not apply; CLI-18-4, 87 NRC 89 (2018)

RULES OF PRACTICE

appeal as of right on the question whether a petition to intervene should have been wholly denied is allowed; CLI-18-4, 87 NRC 89 (2018)

contentions must be raised at the earliest possible opportunity; CLI-18-5, 87 NRC 119 (2018)

failure to fulfill any of the contention admissibility requirements of 10 C.F.R. 2.309(f)(1) renders a contention inadmissible; CLI-18-4, 87 NRC 89 (2018); LBP-18-1, 87 NRC 1 (2018)

intervenor seeking to admit a new or amended contention must base its filing on information that is materially different from that which was previously available; LBP-18-2, 87 NRC 21 (2018)

intervention petitioner in a licensing proceeding must demonstrate standing and proffer a contention that satisfies this agency's contention admissibility criteria; LBP-18-1, 87 NRC 1 (2018)

party other than petitioner has a right to appeal on the question whether a petition to intervene should have been wholly denied; CLI-18-5, 87 NRC 119 (2018)

proponent of a motion has the burden of proof; LBP-18-2, 87 NRC 21 (2018)

request for hearing must set forth with particularity the contentions sought to be raised; CLI-18-4, 87 NRC 89 (2018)

SAFETY ANALYSIS

accident analysis methodology for radioisotope production facility is discussed; CLI-18-6, 87 NRC 130 (2018)

determinations that NRC must make to allow construction of a commercial medical radioisotope production facility are described; CLI-18-6, 87 NRC 130 (2018)

licensee must provide for verifying or checking adequacy of design, such as by performance of design reviews, by use of alternative or simplified calculational methods, or by performance of a suitable testing program; DD-18-1, 87 NRC 111 (2018)

request for action on deficiencies in the analysis of record for the main steam isolation valve room pressurization following a high-energy line break is granted in part; DD-18-1, 87 NRC 111 (2018)

SAFETY CULTURE

chilling effect letter is a regulatory tool that NRC uses to ensure that licensees are taking appropriate actions to foster a workplace environment that encourages employees to raise safety concerns and to feel free to do so without fear of retaliation; DD-18-1, 87 NRC 111 (2018)

issuance of a demand for information was not necessary to evaluate the safety-conscious work environment concerns expressed in the 2.206 petition; DD-18-1, 87 NRC 111 (2018)

SAFETY EVALUATION REPORT

issuance of NRC Staff's SER does not trigger the migration tenet; LBP-18-2, 87 NRC 21 (2018)

SAFETY ISSUES

Advisory Committee on Reactor Safeguards is a committee of technical experts who provide the Commission with an independent assessment of the safety aspects of an application; CLI-18-1, 87 NRC 39 (2018)

matters resolved at the design certification stage are generally excluded from review of a combined license; CLI-18-1, 87 NRC 39 (2018)

SUBJECT INDEX

matters that must be must addressed in the combined license mandatory hearing are outlined in 10 C.F.R. 52.97(a)(1); CLI-18-1, 87 NRC 39 (2018)

SAFETY-RELATED

items relied on for safety are engineered or administrative controls or control systems that are applied to reduce the likelihood of an accident such that the event either becomes highly unlikely or its consequences are reduced to meet the performance requirements in 10 C.F.R. 70.61(b)-(e); CLI-18-6, 87 NRC 130 (2018)

methodologies described in standard review plan for fuel cycle facility are an acceptable way to demonstrate adequate safety in design and operation of a radioisotope production facility; CLI-18-6, 87 NRC 130 (2018)

nuclear power plant structures, systems, and components important to safety must be designed to withstand the effects of earthquakes and other natural phenomena without loss of their safety functionality; CLI-18-4, 87 NRC 89 (2018)

proposed design of medical radioisotope production facility incorporates safety-related and non-safety-related structures, systems, and components that are further categorized based on whether they would be designed to meet the performance requirements for accidents or for normal operations; CLI-18-6, 87 NRC 130 (2018)

SEISMIC DESIGN

nuclear power plant structures, systems, and components important to safety must be designed to withstand the effects of earthquakes and other natural phenomena without loss of their safety functionality; CLI-18-4, 87 NRC 89 (2018)

SETTLEMENT AGREEMENTS

in light of settlement agreement and petitioners' notices of anticipated withdrawal, motion to hold in abeyance petition for leave to intervene and request for hearing is granted pending further notification from petitioners or applicants or further Commission order; CLI-18-3, 87 NRC 87 (2018)

SITE HYDROLOGY

migration of contention that applicant fails to include adequate hydrogeological information to demonstrate ability to contain fluid migration is decided; LBP-18-2, 87 NRC 21 (2018)

SITE SUITABILITY

findings for issuance of a construction permit require that site criteria in 10 C.F.R. Part 100 be considered to ensure that the proposed radioisotope production facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public; CLI-18-6, 87 NRC 130 (2018)

NRC Staff evaluates physical characteristics of the site, with particular focus on security and emergency plans and measures that ensure the public health and safety; CLI-18-1, 87 NRC 39 (2018)

reactor sites in areas of low population density are generally preferred, but a particular site not in an area of low density but located away from a high-density population may still be acceptable; CLI-18-1, 87 NRC 39 (2018)

reactor sites should be located away from very densely populated centers; CLI-18-1, 87 NRC 39 (2018)

SOURCE MATERIALS LICENSE AMENDMENT

petitioner's request that NRC reconsider issuance of amendment to source materials license, citing deficiencies in environmental radiation monitoring plan for depleted uranium, is denied; DD-18-2, 87 NRC 163 (2018)

SPECIAL CIRCUMSTANCES

NRC Staff must determine that the special circumstances warranting an exemption for a departure from a certified design outweigh any decrease in safety resulting from the reduction in standardization that may result from the exemption; CLI-18-1, 87 NRC 39 (2018)

SPENT FUEL POOLS

fire analysis is not required at the early site permit stage because focus of an early site permit is the alternative site analysis and whether there is any obviously superior alternative to the site proposed; CLI-18-5, 87 NRC 119 (2018)

identification of an omission in the environmental report and demonstration that spent fuel pool accident consequences either must be considered or shown to be remote and speculative to satisfy the NRC's obligations under NEPA is sufficient for an admissible contention of omission; CLI-18-5, 87 NRC 119 (2018)

SUBJECT INDEX

- NRC is required to address the environmental consequences of spent fuel pool accidents unless they could be found to be remote and speculative; CLI-18-5, 87 NRC 119 (2018)
- SPENT FUEL STORAGE
Commission is not required under the Atomic Energy Act to make predictive findings regarding technical feasibility of spent fuel disposal as part of its reactor licensing decisions; CLI-18-1, 87 NRC 39 (2018)
- STANDARD OF REVIEW
Commission defers to a board's contention admissibility rulings unless the appeal points to an error of law or abuse of discretion; CLI-18-4, 87 NRC 89 (2018); CLI-18-5, 87 NRC 119 (2018)
Commission does not review construction permit application de novo, but rather determines whether NRC Staff's review was sufficient to support the required findings; CLI-18-6, 87 NRC 130 (2018)
- STANDARD REVIEW PLANS
methodologies described for fuel cycle facility are an acceptable way to demonstrate adequate safety in design and operation of a radioisotope production facility; CLI-18-6, 87 NRC 130 (2018)
- STANDING TO INTERVENE
contemporaneous judicial concepts of standing require petitioner to allege an injury in fact that is fairly traceable to the challenged action and is likely to be redressed by a favorable decision; LBP-18-1, 87 NRC 1 (2018)
fifty-mile proximity presumption is simply a shortcut for determining standing in certain cases; LBP-18-1, 87 NRC 1 (2018)
licensing board has an independent obligation to determine whether a petitioner satisfies standing requirements, even if there is no challenge; LBP-18-1, 87 NRC 1 (2018)
petitioner is presumed to have standing to intervene if petitioner lives within approximately 50 miles of the facility in question; LBP-18-1, 87 NRC 1 (2018)
proximity presumption rests on the finding that persons living within the roughly 50-mile radius of a facility face a realistic threat of harm if a release from the facility of radioactive material were to occur; LBP-18-1, 87 NRC 1 (2018)
proximity presumption was been applied in a reactor license renewal proceeding; LBP-18-1, 87 NRC 1 (2018)
- STANDING TO INTERVENE, REPRESENTATIONAL
petitioner must satisfy four requirements; LBP-18-1, 87 NRC 1 (2018)
- STRUCTURAL INTEGRITY
applicant for a combined license under Part 52 must include in the application a design-specific assessment of the proposed facility's ability to withstand the impact of an aircraft crash; CLI-18-5, 87 NRC 119 (2018)
contention alleging that license renewal application does not undertake an adequate aging management review of the concrete on the containment vessel fails to raise a genuine dispute; LBP-18-1, 87 NRC 1 (2018)
nuclear power plant structures, systems, and components important to safety must be designed to withstand the effects of earthquakes and other natural phenomena without loss of their safety functionality; CLI-18-4, 87 NRC 89 (2018)
- TRANSMISSION LINES
Federal Energy Regulatory Commission has recently adopted policies that promote the expansion of the transmission grid; LBP-18-1, 87 NRC 1 (2018)
- URANIUM
SEE Depleted Uranium
- URANIUM MINING AND MILLING
See In Situ Leach Mining
- VALVES
See Main Steam Isolation Valves
- VIOLATIONS
failure to identify design deficiencies involving secondary missiles from the safety-related main steam safety valve room pressurization is a non-cited violation; DD-18-1, 87 NRC 111 (2018)
- WAIVER OF RULE
Commission considers whether rule waiver proponents have shown or alleged special circumstances that were not contemplated during the rulemaking proceeding; CLI-18-2, 87 NRC 78 (2018)

SUBJECT INDEX

to the extent that petitioners seek to waive Part 110's definition of radioactive waste for this particular proceeding so that applicant would need a specific import license, Commission finds that petitioners have not shown that the definition of "radioactive waste" fails to serve the purposes for which it was adopted; CLI-18-2, 87 NRC 78 (2018)

WASTE DISPOSAL

See Radioactive Waste Disposal

WORK ENVIRONMENT

chilling effect letter is a regulatory tool that NRC uses to ensure that licensees are taking appropriate actions to foster a workplace environment that encourages employees to raise safety concerns and to feel free to do so without fear of retaliation; DD-18-1, 87 NRC 111 (2018)

FACILITY INDEX

BRAIDWOOD NUCLEAR POWER STATION, Units 1 and 2; Docket Nos. STN 50-456, STN 50-457
REQUEST FOR ACTION; April 24, 2018; DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206;
DD-18-1, 87 NRC 111 (2018)

BYRON NUCLEAR POWER STATION, Units 1 and 2; Docket Nos. STN 50-454, STN 50-455
REQUEST FOR ACTION; April 24, 2018; DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206;
DD-18-1, 87 NRC 111 (2018)

MEDICAL RADIOISOTOPE PRODUCTION FACILITY; Docket No. 50-609-CP
CONSTRUCTION PERMIT; May 3, 2018; MEMORANDUM AND ORDER; CLI-18-6, 87 NRC 130
(2018)

POHAKULOA TRAINING AREA; Docket No. 40-9083
REQUEST FOR ACTION; May 15, 2018; DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206;
DD-18-2, 87 NRC 163 (2018)

RIVER BEND STATION, Unit 1; Docket No. 50-458-LR
OPERATING LICENSE RENEWAL; January 8, 2018; MEMORANDUM AND ORDER (Denying Sierra
Club's Petition for Intervention and Request for Hearing); LBP-18-1, 87 NRC 1 (2018)

SEABROOK STATION, Unit 1
OPERATING LICENSE AMENDMENT; April 12, 2018; MEMORANDUM AND ORDER; CLI-18-4, 87
NRC 89 (2018)

TURKEY POINT NUCLEAR GENERATING Units 6 and 7; Docket Nos. 52-040-COL, 52-041-COL
COMBINED LICENSE; April 5, 2018; MEMORANDUM AND ORDER; CLI-18-1, 87 NRC 39 (2018)

VERMONT YANKEE NUCLEAR POWER STATION; Docket No. 50-271-LT-2
LICENSE TRANSFER; April 12, 2018; MEMORANDUM AND ORDER; CLI-18-3, 87 NRC 87 (2018)