



# REGULATORY GUIDE

## REGULATORY GUIDE 1.185

(Draft was issued as DG-1272, dated December 2012)

# STANDARD FORMAT AND CONTENT FOR POST-SHUTDOWN DECOMMISSIONING ACTIVITIES REPORT

## A. INTRODUCTION

### Purpose

This regulatory guide identifies the type of information that the post-shutdown decommissioning activities report (PSDAR) must contain and establishes a standard format for the PSDAR that the U.S. Nuclear Regulatory Commission (NRC) staff considers acceptable. This regulatory guide applies only to holders of licenses to operate nuclear power reactors under Parts 50 (Ref. 1) and 52 (Ref. 2) of Title 10 of the *Code of Federal Regulations* (10 CFR) and they may use this standard format to prepare PSDARs.

### Applicable Rules and Regulations

- 10 CFR Part 50 provides for the NRC's domestic licensing of production and utilization facilities.
  - 10 CFR 50.2 provides definitions.
  - 10 CFR 50.4 provides the requirements for written communications.
  - 10 CFR 50.54 provides the conditions for a license.
  - 10 CFR 50.75 provides the requirements for reporting and recordkeeping for decommissioning planning.
  - 10 CFR 50.82 provides the requirements for termination of a license including a requirement for nuclear power reactors licensees to submit a PSDAR.

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Electronic copies of this regulatory guide, previous versions of this guide, and other recently issued guides are available through the NRC's public Web site under the Regulatory Guides document collection of the NRC Library at <http://www.nrc.gov/reading-rm/doc-collections/>. The regulatory guide is also available through the NRC's Agencywide Documents Access and Management System (ADAMS) at <http://www.nrc.gov/reading-rm/adams.html>, under ADAMS Accession No. 13140A038. The regulatory analysis may be found in ADAMS under Accession No. ML13140A039. There were no public comments on DG-1272.

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- 10 CFR Part 51 (Ref. 3) provides the requirements for environmental protection regulations for the NRC’s domestic licensing and related regulatory functions.
- 10 CFR Part 52 governs the issuance of early site permits, standard design certifications, combined licenses, standard design approvals, and manufacturing licenses for nuclear power facilities licensed under Section 103 of the Atomic Energy Act of 1954, as amended (68 Stat. 919), and Title II of the Energy Reorganization Act of 1974 (88 Stat. 1242).

### **Related Guidance**

- Regulatory Guide (RG) 1.184, “Decommissioning of Nuclear Power Reactors” provides overall guidance on steps involved with the decommissioning of power reactors (Ref. 4).
- RG 4.21, “Life Cycle Planning for Decommissioning” provides guidance to license applicants on the steps that can be taken to minimize contamination and facilitate decommissioning in the context of a risk-informed approach (Ref. 5).
- RG 4.22, “Decommissioning Planning During Operations” provides guidance on implementation of the Decommissioning Planning Rule (Ref. 6).
- NRC, “Final Standard Review Plan for Decommissioning Cost Estimates for Nuclear Power Reactors,” NUREG-1713 provides information on how the NRC staff will review site-specific decommissioning cost estimates (Ref. 7).

### **Purpose of Regulatory Guides**

The NRC issues regulatory guides to describe to the public methods that the staff considers acceptable for use in implementing specific parts of the agency’s regulations, to explain techniques that the staff uses in evaluating specific problems or postulated accidents, and to provide guidance to applicants. Regulatory guides are not substitutes for regulations and compliance with them is not required. Methods and solutions that differ from those set forth in regulatory guides will be deemed acceptable if they provide a basis for the findings required for the issuance or continuance of a permit or license by the Commission.

### **Paperwork Reduction Act**

This regulatory guide contains information collection requirements covered by 10 CFR Part 50, 10 CFR Part 51, and 10 CFR Part 52 that the Office of Management and Budget (OMB) approved under OMB control number 3150-0011, 3150-0021, and 3150-0151, respectively. The NRC may neither conduct nor sponsor, and a person is not required to respond to, an information collection request or requirement unless the requesting document displays a currently valid OMB control number.

## **B. DISCUSSION**

### **Reason for Change**

Since the issuance of RG 1.185 in 2000, several licensees have submitted PSDARs for NRC review. As a result of these reviews, the NRC staff has found common areas that have resulted in NRC issuing requests for additional information and licensees performing additional analyses to address those requests. These additional activities result in delays in completing these reviews. Further, the additional

requests resulted in increased costs to licensees, either because of the costs associated with responding to them, or NRC charges for additional staff time to complete the reviews. Lessons learned applicable to the PSDAR include:

- **Communications** - Early and frequent discussions between NRC staff and licensees are encouraged during the planning and scoping phase supporting the preparation of a PSDAR would be beneficial.
- **Ground water** - Additional environmental monitoring data may be needed because licensees may not have enough operational environmental monitoring of groundwater for adequate site characterization and dose assessments. This will be an important consideration in preparing site-specific estimates of decommissioning costs.
- **Decommissioning Cost Estimate** - The discussion should include a clear relationship between the planned decommissioning activities and the associated updated cost estimate.
- **Environmental Assessments** - Some environmental submittals have not provided sufficient information addressing non-radiological impacts of the proposed action, as required by the National Environmental Policy Act.

## The PSDAR

As defined in 10 CFR 50.2, “decommission” means to remove a facility or site safely from service and reduce residual radioactivity to a level that permits either:

- (1) Release of the property for unrestricted use and termination of the license;  
or
- (2) Release of the property under restricted conditions and termination of the license.

The purpose of the PSDAR is to provide the NRC and the public with a general overview of the licensee’s proposed decommissioning activities and to inform the NRC staff of the licensee’s expected activities and schedule so that the staff can plan for inspections and make decisions about its oversight activities. The PSDAR is also a mechanism that informs the public of the proposed decommissioning activities before the conduct of those activities.

The NRC published a final rule on decommissioning nuclear power reactors in the *Federal Register* (61 FR 39278) on July 29, 1996. It amended the NRC’s regulations on decommissioning procedures that will lead to the termination of an operating license for nuclear power reactors. This rule included changes to 10 CFR Part 2, “Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders;” 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities;” and 10 CFR Part 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.” On June 17, 2011, the NRC promulgated the Decommissioning Planning Rule (DPR) (76 FR 35512). The DPR requires all licensees to establish operational practices to minimize site contamination and perform reasonable subsurface radiological surveys and sets forth new financial assurance requirements which require more detail in the cost estimate submitted with the PSDAR than the estimates done for the financial assurance requirements of 10 CFR 50.75. The ultimate goal of the DPR is for licensees to have sufficient funds to conduct site remediation and terminate their licenses effectively and efficiently.

For licensees that submitted a decommissioning plan before August 28, 1996, the NRC considers the decommissioning plan and the associated environmental review to be the PSDAR submittal (10 CFR 50.82, "Termination of License"). Decommissioning plans normally contain sufficient information to satisfy the requirements of the PSDAR. Licensees that have an approved decommissioning plan must submit an update for activities that they had not considered in their decommissioning plans to comply with 10 CFR 50.82(a)(7). The NRC encourages licensees to replace their decommissioning plans with a PSDAR update that uses the format and content specified in this document.

The regulation at 10 CFR 50.82(a)(4)(i) requires the licensee to submit a PSDAR to the NRC either before or not later than 2 years after permanent cessation of operations. The report must include a description of the licensee's planned decommissioning activities, a schedule for the accomplishment of significant milestones, and an estimate of all expected costs. The PSDAR should also document the results of the licensee's evaluation of the environmental impacts associated with site-specific decommissioning activities. The evaluation should include a comparison of the site-specific environmental impacts of the proposed decommissioning to those impacts identified in previously issued environmental statements, that is, NUREG-0586, "Final Generic Environmental Impact Statement [GEIS] on Decommissioning of Nuclear Facilities," issued August 1988 (Ref. 8), and NUREG-1496, Volume 1, "Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Nuclear Facilities," issued July 1997 (Ref. 9).

The regulation at 10 CFR 50.82(a)(5) prohibits the licensee from performing any major decommissioning activities until 90 days after the NRC has received its PSDAR submission and until the licensee has submitted the certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel. In 10 CFR 50.2, "Definitions," the NRC defines major decommissioning activities as "...any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components for shipment containing greater than class C waste...." It defines major radioactive components as "the reactor vessel and internals, steam generators, pressurizers, large bore reactor coolant system piping, and other large components that are radioactive to a comparable degree."

Once the NRC receives the PSDAR, it will docket the report and publish a notice of receipt in the *Federal Register* to solicit comments on the PSDAR from the public in accordance with 10 CFR 50.82(a)(4)(ii). A copy of the PSDAR will be made available to the public at the Public Document Room and electronically through the NRC Library on the NRC's Web site at <http://www.nrc.gov/reading-rm/adams>. The NRC will schedule a public meeting in the vicinity of the site to describe planned activities and to hear public comments. Comments received by the NRC staff on the PSDAR will be addressed at the public meeting, and a question and answer period will follow the presentations. The NRC will prepare a written transcript of the meeting and make it available to the public through the Public Document Room and electronically through the NRC Library on the NRC's Web site at <http://www.nrc.gov/reading-rm/adams>. To the extent possible, the public meeting should be held within 90 days of the NRC's receipt of the licensee's PSDAR submittal; it normally would be held about 30 days before the 90-day period ends.

The NRC will determine whether the licensee's PSDAR contains the information required by the regulation. Although the NRC's review and approval of the PSDAR is not required, if the NRC determines that the information provided by the licensee in the PSDAR does not comply with the requirements in 10 CFR 50.82(a)(4)(i), it will inform the licensee in writing of the additional information required by the regulations before the PSDAR public meeting and before major

decommissioning activities begin. Section C.5 of this guide lists factors that could cause the NRC to find the PSDAR deficient.

### **Harmonization with International Standards**

The following International Atomic Energy Agency safety standards provide useful information on decommissioning and this guide takes into account the criteria found in them:

“Decommissioning of Facilities Using Radioactive Material,” Safety Requirements Series WS-R-5 (Ref. 10);

“Decommissioning of Nuclear Power Plants and Research Reactors,” Safety Guide WS-G-2.1 (Ref. 11);

“Decommissioning of Medical, Industrial and Research Facilities,” Safety Guide WS-G-2.2 (Ref. 12);

“Decommissioning of Nuclear Fuel Cycle Facilities,” Safety Guide WS-G-2.4 (Ref. 13); and

“Safety Assessment for the Decommissioning of Facilities Using Radioactive Material,” Safety Guide WS-G-5.2 (Ref. 14).

## **C. STANDARD FORMAT AND CONTENT**

The purposes of the PSDAR are to: (1) inform the public of the licensee’s planned decommissioning activities, (2) assist in the scheduling of NRC resources necessary for the appropriate oversight activities, (3) ensure that the licensee has considered all the costs of the planned decommissioning activities and has considered the funding for the decommissioning process, and (4) ensure that the environmental impacts of the planned decommissioning activities are bounded by those considered in existing environmental impact statements.

The licensee must submit the PSDAR to the NRC 90 days before it begins any major decommissioning activities, as defined in 10 CFR 50.2. The regulation at 10 CFR 50.82(a)(4)(i) requires the licensee to include in the PSDAR: (1) a description of its planned major decommissioning activities, (2) a schedule for completing these activities, (3) an estimate of all the expected decommissioning costs, and (4) a discussion that provides the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements. The following sections discuss each of these items in further detail and describe the content expected by the NRC staff.

### **1. Description of the Licensee’s Planned Decommissioning Activities**

The PSDAR should describe the licensee’s planned activities for decommissioning. The purpose of the description is to inform the NRC and the public of the planned decommissioning by providing a general overview of the proposed decommissioning activities and by identifying specific activities to be accomplished or performed.

The licensee should describe in general terms the method or combination of methods selected for decommissioning. The available methods are: (1) long-term storage (SAFSTOR) followed by decontamination and dismantlement, (2) prompt decontamination and dismantlement, and (3) partial

decontamination and dismantlement followed by long-term storage and then final decontamination and dismantlement. In addition, the licensee should list and describe the major activities and tasks related to decommissioning and should identify and discuss them briefly in the order in which they will occur. The level of detail of the description provided for each of the activities will depend, in part, on the nature of the activity. The licensee should describe activities that are unique to the facility and that would thus require additional NRC staff oversight in greater detail than for routine activities. For example, a chemical decontamination of a slightly radioactively contaminated system using a mild acid would need only a short description of the process. However, to allow the staff to determine the proper level of oversight, the NRC expects that the use of a unique chemical decontamination method on a system containing large amounts of contamination (e.g., the primary system) would result in a more detailed description of the process. Likewise, the licensee should discuss in greater detail an activity that could result in an environmental impact that may be outside the bounds of those considered in NUREG-0586, the decommissioning GEIS, such as the removal, processing, and storage of fuel debris contained in a system or in the spent fuel pool.

This guide provides the activities listed below merely as examples; they are not meant to be all-inclusive or to imply that a given licensee should include each of the activities in the decommissioning process. The description of the licensee's planned decommissioning activities should provide a general, site-specific overview of all the activities that occur from the time of certification of permanent removal of the fuel to the anticipated termination of the license.

For prompt decontamination and dismantlement, the licensee should describe activities, such as the following:

- a. Removing the reactor vessel and internals;
- b. Removing other large components, including major radioactive components;
- c. Removing the balance of the primary system (e.g., the charging and boron control systems);
- d. Conducting general activities related to the removal of other significant radioactive components and any structures;
- e. Decontaminating radioactive components, including the use of chemical decontamination techniques;
- f. Decontaminating structures or buildings, such as the auxiliary and fuel handling buildings;
- g. Conducting activities related to special or unusual programs (e.g., the removal and processing of fuel debris from the spent fuel pool) that might result in impacts that were not considered in the decommissioning GEIS (these activities would need to be described in greater detail);
- h. Storing components on site;
- i. Shipping and processing low-level radioactive waste, including any anticipated compaction; minimization, or incineration of the waste;
- j. Locating the ultimate disposal site (if known) for low-level radioactive waste, and plans for interim storage, if necessary;

- k. Storing or removing the spent fuel and greater-than-Class-C waste, including the use (if planned) of an independent spent fuel storage installation or wet storage facility;
- l. Removing hazardous radioactive (mixed) wastes; and
- m. Making changes to management and staffing.

If long-term storage (longer than approximately 5 years) followed by dismantlement is selected as a decommissioning option, the licensee should list and describe activities related to preparing the facility and site for storage. It should also discuss activities and tasks for maintaining the facility and site in safe storage preparatory to dismantlement. The description of the preparation process and the storage phase should specifically identify activities, such as those in the following examples:

- a. Draining of specific systems and removal of resins from ion exchangers;
- b. Decontamination of specific high-dose areas;
- c. Removal of low-level waste that is ready for shipment;
- d. Shipment and processing or storage of the fuel and greater-than-Class-C waste;
- e. Reenergization or deactivation of specific systems;
- f. Reconfiguration of ventilation systems and fire protection systems for use during the storage period;
- g. Inspection and monitoring of plans during the storage period;
- h. Maintenance of any systems critical to final dismantlement during the storage period;
- i. Management of any systems that remain connected to operating units on the site; and
- j. Changes to management and staffing.

The licensee should also describe, to the extent known, activities related to the transition from long-term storage to decommissioning and activities related to the final decommissioning of the facility. The regulation at 10 CFR 50.82(a)(3) requires the licensee to complete decommissioning within 60 years of permanent cessation of operation unless the NRC approves a longer term for completion as necessary for public health and safety.

The NRC does not require or expect details in the PSDAR on the radiation protection plan or the security plan or discussions on quality assurance related to decommissioning; however, this information may be required in periodic updates to the final safety analysis report.

## **2. Schedule of Planned Decommissioning Activities**

The purpose of the schedule is to inform the NRC and the public of the anticipated timing of decommissioning events and to allow the NRC to schedule resources necessary for appropriate oversight activities. The schedule should show the relationship between the activities for the major activities described in Section C.1 of this guide so that the reader understands the sequence and timing of the events.

Schedules or diagrams should clearly indicate the estimated dates of the initiation and completion of major decommissioning activities, especially those with potential increased risk to the workers, public, or environment or those that are unique to the facility. The licensee should identify any activities that will require a significant NRC licensing effort, including the estimated start and end dates for activities, such as the submission of defueled technical specifications; the approval and licensing of an independent spent fuel storage installation; the licensing activities associated with a certificate of compliance for the transportation of major components; or the approval of the license termination plan. Section C.6 of this guide addresses changes to the schedule following submission of the PSDAR.

The schedule's level of detail will depend on the timing of the activity and will assist the NRC in determining the degree of oversight required. The schedule for major activities in the near term (about 5 years) should provide the nearest month and year. The licensee may schedule activities that will follow a storage period of at least 5 years to the closest year.

### **3. Estimate of Expected Decommissioning Costs**

The regulation at 10 CFR 50.75(b)(2) requires the licensee to annually adjust the minimum amount of decommissioning funds required by 10 CFR 50.75(c)(2). The cost estimate presented in the PSDAR should be based on the latest annual update and include the cost of any contamination identified during site surveys. The amount estimated cannot be less than the minimum adjusted amount specified in 10 CFR 50.75(c).

The PSDAR must include an updated estimate of the expected decommissioning costs. The updated cost estimate required by 10 CFR 50.82(a)(4)(i) may be: (1) the amount of decommissioning funds estimated to be required under 10 CFR 50.75(b) and (c) as currently reported to the NRC in accordance with 10 CFR 50.75(f)(1), (2) a site-specific cost estimate that is based on the activities and schedule discussed in Sections C.1 and C.2 above, (3) an estimate based on actual costs at similar facilities that have undergone similar decommissioning activities, or (4) a generic cost estimate. The cost of remediating known environmental contamination should be included (soil, groundwater, surface water, etc.). The licensee should base its decision on which type of estimate to include in the PSDAR on specific plans for decommissioning. If a licensee has chosen extended safe storage of the facility followed by decontamination and dismantlement, the NRC would consider using generic information acceptable because cost estimates of final dismantlement could occur far in the future. The licensee is reminded that a site-specific cost estimate is required within 2 years of permanently ceasing operation (10 CFR 50.82(a)(8)(iii)). The licensee may consider submitting site-specific cost estimate data before or concurrently with the PSDAR if it is planning immediate decontamination and dismantlement to avoid the temporal limits on spending more than 23 percent of the decommissioning funds. Following submission of a site-specific cost estimate, if the licensee specifies the delayed completion of decommissioning in its PSDAR, it must provide a means of adjusting cost estimates and associated funding levels over the duration of the storage or surveillance period to ensure that the appropriate amount of funding will be available to terminate the license as required by 10 CFR 50.82(a)(8)(iv). The PSDAR should describe that mechanism.

The licensee's method of providing financial assurance may affect the type of cost estimate provided in the PSDAR. Note that the financial assurance provisions of 10 CFR 50.75(e)(1)(i) and (ii) require the licensee to provide a site-specific cost estimate under certain conditions. For example, if the licensee intends to take credit for projected future earnings on the decommissioning funds held in a prepaid or external sinking fund account during a period of safe storage, then the licensee must provide a site-specific cost estimate that specifically describes the cash flows during the decommissioning period. A licensee that certifies its decommissioning financial assurance only to the formula amount of 10 CFR



50.75(c) may take an earnings credit only for the first 7 years after permanent shutdown.

Generic cost estimate methods appear in NUREG/CR-0672, “Technology, Safety and Costs of Decommissioning a Reference Boiling Water Reactor Power Station,” issued June 1980, including Addenda 1–4 (Ref. 15); NUREG/CR-0130, “Technology, Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station,” issued June 1978 (Ref. 16); NUREG/CR-5884, “Revised Analysis of Decommissioning for the Reference Pressurized Water Reactor Power Station,” issued November 1995 (Ref. 17); NUREG/CR-6174, “Revised Analyses of Decommissioning for the Reference Boiling Water Reactor Power Station,” issued July 1996 (Ref. 18); and NUREG-0586 the GEIS on decommissioning.

#### **4. Environmental Impacts**

Under 10 CFR 50.82(a)(4)(i), a licensee’s PSDAR must include the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by previously issued environmental impact statements. Before preparing the PSDAR, the licensee should evaluate the potential environmental impacts associated with the site-specific decommissioning activities, including those activities listed in Section C.1 of this guide. The potential environmental impacts associated with decommissioning should be compared to similar impacts given in the final environmental statement (FES) for the plant (as supplemented), the GEIS on decommissioning (NUREG-0586), and site-specific environmental assessments. The comparison to impacts in the GEIS should recognize the unique nature of the site. If the licensee has already considered the postulated impacts associated with decommissioning in the plant-specific FES, as supplemented, or in the GEIS, the licensee should state this in the PSDAR (10 CFR 50.82(a)(4)(i)). The PSDAR does not need to include an analysis of the specific environmental impacts associated with decommissioning activities. For those activities determined to have impacts greater than those evaluated in the decommissioning GEIS, FES, or site-specific analysis, the licensee must complete a supplement to these documents before it initiates activities. Although the PSDAR does not need to include an analysis of the specific environmental impacts associated with decommissioning activities, the licensee must ensure that supporting documentation and analyses are available at the reactor site for inspection by the NRC staff. Potential impacts include both radiological and non-radiological impacts. Examples of potential impacts that should be examined to ensure that they are within the envelope of impacts predicted in the GEISs on decommissioning or radiological criteria for license termination, FES, or site-specific analysis include: occupational dose; public dose; environmental releases to air, water, and soil and the resulting population doses; quantity of low-level radioactive waste generated; transportation impacts; and impacts from non-radiological hazards, such as dust, noise, water use, and hazardous (non-radiological) waste.

The licensee’s dose estimates should be for total effective dose equivalent to workers and to the public, including that from releases and transportation. The licensee should briefly describe how these estimates of total effective dose equivalent compare to, or are different from, the GEIS or FES whole body and organ dose estimates.

The licensee should also specifically examine impacts to endangered and threatened species. In many cases, the list of endangered or threatened species has changed since the most recent FES. The licensee should obtain a current list from the appropriate U.S. Fish and Wildlife Service office and should make a determination as to the likelihood that a protected species is found on the site. If any species is likely to be affected by the decommissioning of the facility, the PSDAR should identify this potential.

Any planned decommissioning activity using a method not considered in the NUREG-0586, the GEIS on decommissioning, could cause an environmental impact that the licensee had not considered

and should be specifically examined. For example, the explosive destruction of buildings could result in environmental impacts not considered in the GEIS or in the site-specific FES.

If significant environmental impacts are identified that have not been considered in the plant-specific FES or in the GEISs on decommissioning (Ref. 8) and on radiological criteria for license termination (Ref. 9), 10 CFR 50.82(a)(6)(ii) prohibits the licensee from undertaking the activity that would result in such an impact without first complying with 10 CFR Part 51. The licensee must submit a supplement to its environmental report that relates to the additional impacts under 10 CFR Part 51.

For plants that do not have an FES, an environmental assessment, such as that prepared for the change from a provisional operating license to a full-term operating license, is appropriate.

## **5. Factors That Could Cause the NRC To Find the PSDAR Deficient**

A number of factors could cause the NRC to find the PSDAR deficient. These factors are directly related to the topics included in the PSDAR, as discussed above. The NRC could find the PSDAR deficient under the following circumstances:

- The licensee could not complete its plan for decommissioning as described (e.g., if the plan called for immediate decontamination and dismantlement of the facility but no waste disposal facilities available for use by the facility exist at that time).
- The schedule includes a decommissioning process that the licensee could not complete within 60 years of the permanent cessation of operations as required by 10 CFR 50.82(a)(3) unless the NRC determines that a longer decommissioning period is necessary to protect public health and safety. The NRC would consider such actions on a case-by-case basis.
- The licensee's decommissioning plans, as presented in the PSDAR, include a decommissioning process that could not be completed for the estimated cost using the generic guidelines in the decommissioning GEIS and using previous facility decommissioning costs or that could not be completed if the estimated costs were less than the minimum amount in 10 CFR 50.75(c).
- The PSDAR includes activities that would endanger public health and safety by proposing activities that do not comply with the NRC's health and safety regulations or that would result in a significant detrimental impact to the environment that is not bounded by the current environmental impact statements.

## **6. Changes to the PSDAR**

The regulation at 10 CFR 50.82(a)(7) requires the licensee to notify the NRC, in writing with a copy to the affected States, before it performs any significant decommissioning activity that could be considered inconsistent with, or a significant schedule change from, the planned decommissioning activities or schedules described in the PSDAR. Changes to the PSDAR may be in the form of a written letter to the NRC or may be an actual revision to the PSDAR. Changes that result in any type of environmental impact that is not bounded by previously issued environmental impact statements would need a supplement to the environmental report. As with an initial PSDAR submittal, the licensee should submit the supplement to the NRC with the planned PSDAR change and should send a copy to the affected States. The regulation also requires the licensee to notify the NRC of changes that significantly increase the decommissioning costs and to send a copy to the affected States.

The licensee may change the PSDAR any time after submittal. However, if the licensee makes significant changes to major schedules or to the cost estimate, it must provide written notification to the NRC per 10 CFR 50.82(a)(7). The NRC staff will use changes to the milestone schedule to schedule inspections of the licensee's activities and to provide assurance that the licensee is conducting decommissioning safely and in accordance with regulatory requirements. Examples of changes in activities and schedule include, but are not limited to, changing from long-term storage to active dismantlement, changing the method used to remove the reactor vessel or steam generators from cutting and segmenting to intact removal, or changing the schedule to affect major milestones. Licensees do not need to report changes on the removal of structures, systems, or components that are not contaminated or in the immediate proximity of contaminated systems that could result in a worker dose.

Examples of significant increases in cost associated with decommissioning the facility include (1) a revised cost estimate that is more than 20 percent greater than the site-specific cost estimate or the PSDAR cost estimate, or (2) a 25-percent increase in cost needed to complete any major milestone. For any significant increase in cost, the licensee must provide written notification to the NRC. Notification should be made only if cost changes occur as a result of changes in the timing of activities, or if the change in planned decommissioning activities results in a significant increase in decommissioning costs. Notification of increased decommissioning costs is not necessary if the increases are simply because of higher estimated costs caused by inflation. However, the licensee should include this information in the annual report submitted in accordance with 10 CFR 50.75(f).

The licensee should evaluate changes in decommissioning activities as to their potential environmental impact. If the expected impact is greater than that predicted in the GEIS or the site-specific FES or if it is outside the bounds of these documents, the licensee must notify the NRC in writing and provide a supplement to the environmental report for the facility that evaluates the impact of the change. For facilities that either have an approved decommissioning plan or submitted a decommissioning plan before the effective date of the 1996 decommissioning rule (August 28, 1996), the decommissioning plan is considered to be the PSDAR submittal in accordance with 10 CFR 50.82. This is appropriate because the decommissioning plan was required to contain all the information required by the PSDAR but in greater detail.

For facilities with approved decommissioning plans, decommissioning can proceed under the associated decommissioning order. In accordance with 10 CFR 50.82(a)(7), significant changes in major milestones, schedules, or cost estimates require written notification to the NRC.

Written notifications of changes to the PSDAR to the NRC that are made under 10 CFR 50.82(a)(7) do not require a 90-day waiting period before the initiation of activities. Typically, the staff would not hold a public meeting to discuss the proposed changes. However, if the licensee proposes changing the method of decommissioning (e.g., from long-term storage followed by decontamination and dismantlement to prompt decontamination and dismantlement), the NRC may conduct a public meeting.

## **7. Format of the PSDAR**

Graphic presentations, such as drawings, maps, diagrams, sketches, and tables, should be employed where the information may be presented more adequately or conveniently by such means. The licensee should ensure that all information presented is legible, symbols are defined, and scales are not reduced to the extent that visual aids are necessary to interpret pertinent items of information. These graphic presentations should be located in the section where they are primarily addressed.

References should appear either as footnotes to the page where they were discussed or at the end of each chapter.

### **Paper Size**

Text pages should be 8-1/2 x 11 inches.

Drawings and graphics should be 8-1/2 x 11 inches; however, a larger size is acceptable provided the finished copy when folded does not exceed 8-1/2 x 11 inches.

### **Paper Stock and Ink**

Use suitable quality in substance, paper color, and ink density for handling and for reproduction by or image-copying equipment.

### **Page Margins**

The margin should be 1 inch or more on the top, bottom, and binding side of all pages submitted.

### **Printing**

Text pages should be single spaced.

Type face and style should be suitable for image-copying equipment, including computer scanning.

The PSDAR may be mechanically or photographically reproduced. All pages of text should be printed on both sides, and the image should be printed head to head.

### **Binding**

No requirements.

### **Page Numbering**

Pages should be numbered sequentially.

### **Table of Contents**

A table of contents should be included.

### **Procedures for Updating or Revising Pages**

Data and text should be updated or revised by replacing pages. The changed or revised portion on each page should be highlighted by a change indicator mark, consisting of a bold vertical line drawn in the margin opposite the binding margin. The line should be of the same length as the portion actually changed.

All pages submitted to update, revise, or add pages to the report should show the date of change and a change or amendment number. A guide page listing the pages to be inserted and the pages to be

removed should accompany the revised pages. When major changes or additions are made, a revised table of contents should be provided.

### **Exceptions to Physical Specifications**

Electronic media may be used in accordance with 10 CFR 50.4(a). Other forms may be used in accordance with 10 CFR 50.4(c).

## **D. IMPLEMENTATION**

The purpose of this section is to provide information on how licensees<sup>1</sup> may use this guide and information regarding the NRC's plans for using this regulatory guide. In addition, it describes how the NRC staff complies with 10 CFR 50.109, "Backfitting" and any applicable finality provisions in 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

### **Use by Licensees**

Licensees may voluntarily<sup>2</sup> use the guidance in this document to demonstrate compliance with the underlying NRC regulations. Methods or solutions that differ from those described in this regulatory guide may be deemed acceptable if they provide sufficient basis and information for the NRC staff to verify that the proposed alternative demonstrates compliance with the appropriate NRC regulations. Current licensees may continue to use guidance the NRC found acceptable for complying with the identified regulations as long as their current licensing basis remains unchanged.

Licensees may use the information in this regulatory guide for actions which do not require NRC review and approval such as changes to a facility design under 10 CFR 50.59, "Changes, Tests, and Experiments." Licensees may use the information in this regulatory guide or applicable parts to resolve regulatory or inspection issues.

### **Use by NRC Staff**

The NRC staff does not intend or approve any imposition or backfitting of the guidance in this regulatory guide. The NRC staff does not expect any existing licensee to use or commit to using the guidance in this regulatory guide, unless the licensee makes a change to its licensing basis. The NRC staff does not expect or plan to request licensees to voluntarily adopt this regulatory guide to resolve a generic regulatory issue. The NRC staff does not expect or plan to initiate NRC regulatory action which would require the use of this regulatory guide. Examples of such unplanned NRC regulatory actions include issuance of an order requiring the use of the regulatory guide, requests for information under 10 CFR 50.54(f) as to whether a licensee intends to commit to use of this regulatory guide, generic communication, or promulgation of a rule requiring the use of this regulatory guide without further backfit consideration.

During regulatory discussions on plant specific operational issues, the staff may discuss with licensees various actions consistent with staff positions in this regulatory guide, as one acceptable means of meeting the underlying NRC regulatory requirement. Such discussions would not ordinarily be considered backfitting even if prior versions of this regulatory guide are part of the licensing basis of the

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1 In this section, "licensees" refers to licensees of nuclear power plants under 10 CFR Parts 50 and 52.

2 In this section, "voluntary" and "voluntarily" means that the licensee is seeking the action of its own accord, without the force of a legally binding requirement or an NRC representation of further licensing or enforcement action.

facility. However, unless this regulatory guide is part of the licensing basis for a facility, the staff may not represent to the licensee that the licensee's failure to comply with the positions in this regulatory guide constitutes a violation.

If an existing licensee voluntarily seeks a license amendment or change and (1) the NRC staff's consideration of the request involves a regulatory issue directly relevant to this new or revised regulatory guide and (2) the specific subject matter of this regulatory guide is an essential consideration in the staff's determination of the acceptability of the licensee's request, then the staff may request that the licensee either follow the guidance in this regulatory guide or provide an equivalent alternative process that demonstrates compliance with the underlying NRC regulatory requirements. This is not considered backfitting as defined in 10 CFR 50.109(a)(1) or a violation of any of the issue finality provisions in 10 CFR Part 52.

If a licensee believes that the NRC is either using this regulatory guide or requesting or requiring the licensee to implement the methods or processes in this regulatory guide in a manner inconsistent with the discussion in this Implementation section, then the licensee may file a backfit appeal with the NRC in accordance with the guidance in NUREG-1409, "Backfitting Guidelines" (Ref. 19), and the NRC Management Directive 8.4, "Management of Facility-Specific Backfitting and Information Collection" (Ref. 20).

## REFERENCES<sup>3</sup>

1. *U.S. Code of Federal Regulations*, “Domestic Licensing of Production and Utilization Facilities,” Appendix A, “General Design Criteria for Nuclear Power Plants,” Part 50, Title 10, “Energy.”
2. *U.S. Code of Federal Regulations*, “Licenses, Certifications, and Approvals for Nuclear Power Plants,” Part 52, Title 10, “Energy.”
3. *U.S. Code of Federal Regulations*, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions,” Part 51, Title 10, “Energy.”
4. U.S. Nuclear Regulatory Commission (NRC), “Decommissioning of Nuclear Power Reactors,” Regulatory Guide 1.184.
5. NRC, “Life Cycle Planning for Decommissioning,” RG 4.21, Washington, DC.
6. NRC, “Decommissioning Planning During Operations,” RG 4.22, Washington, DC.
7. NRC, “Final Standard Review Plan for Decommissioning Cost Estimates for Nuclear Power Reactors,” NUREG-1713, December 2004, ADAMS Accession No. ML043510113.
8. NRC, “Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities,” Volumes 1 & 2 of Supplement 1, NUREG-0586, Washington, DC, November 2002, ADAMS Accession No. ML023470327 and ML023500310.
9. NRC, “Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Nuclear Facilities,” Volume 1, NUREG-1496, July 1997, ADAMS Accession No. ML042310492.
10. International Atomic Energy Agency (IAEA), “Decommissioning of Facilities Using Radioactive Material,” Safety Requirements Series WS- R-5.
11. IAEA, “Decommissioning of Nuclear Power Plants and Research Reactors,” Safety Guide WS-G-2.1, December 1999.
12. IAEA, “Decommissioning of Medical, Industrial and Research Facilities,” Safety Guide WS-G-2.2, December 1999.
13. IAEA, “Decommissioning of Nuclear Fuel Cycle Facilities,” Safety Guide WS-G-2.4, June 2001.
14. IAEA, “Safety Assessment for the Decommissioning of Facilities Using Radioactive Material,” Safety Guide WS-G-5.2, February 2009.

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<sup>3</sup> Publicly available NRC published documents are available electronically through the NRC Library on the NRC’s public Web site at <http://www.nrc.gov/reading-rm/doc-collections/>. The documents can also be viewed online or printed for a fee in the NRC’s Public Document Room (PDR) at 11555 Rockville Pike, Rockville, MD; the mailing address is USNRC PDR, Washington, DC 20555; telephone (301) 415-4737 or (800) 397-4209; fax (301) 415-3548; and e-mail [pdr.resource@nrc.gov](mailto:pdr.resource@nrc.gov).

15. NRC, "Technology, Safety and Costs of Decommissioning a Reference Boiling Water Reactor Power Station," NUREG/CR-0672, Pacific Northwest Laboratory, Richland, WA, June 1980, Legacy Library Accession No. 8006250171 (including Addendum 1, July 1983; Legacy Library Accession No. 8308180441; Addendum 2, September 1984, Legacy Library Accession No. 8410170289; Addendum 3, July 1988, Legacy Library Accession No. 8808120112; and Addendum 4, December 1990) Legacy Library Accession No. 9102280246.
16. NRC, "Technology, Safety, and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station," NUREG/CR-0130, Pacific Northwest Laboratory, Richland, WA, June 1978, Legacy Library Accession No. 79-9260338; (including Addendum 1, July 1979, Legacy Library Accession No. 7909260338; Addendum 2, July 1983, Legacy Library Accession No. 8308170163; Addendum 3, September 1984, Legacy Library Accession No. 8410170293; and Addendum 4, July 1988, Legacy Library Accession No. 8808120069.
17. NRC, "Revised Analysis of Decommissioning for the Reference Pressurized Water Reactor Power Station," NUREG/CR-5884, Pacific Northwest Laboratory, Richland, WA, November 1995, Legacy Library Accession No. 952260293 (v.1) and 9512260336 (v. 2).
18. NRC, "Revised Analyses of Decommissioning for the Reference Boiling Water Reactor Power Station," NUREG/CR-6174, Pacific Northwest National Laboratory, Richland, WA, July 1996, Legacy Library Accession No.9608210240 (v.1) and 9608210245 (v.2).
19. NRC, "Management of Facility-specific Backfitting and Information Collection," NRC Management Directive 8.4.
20. NRC, "Backfitting and Information Collection, NUREG-1409, July 1990, ADAMS Accession No. ML032230247.