

UNITED STATES NUCLEAR REGULATORY COMMISSION REGION II SAM NUNN ATLANTA FEDERAL CENTER 61 FORSYTH STREET, SW, SUITE 23T85 ATLANTA, GEORGIA 30303-8931

May 13, 2008

Mr. David Stinson President and Chief Operating Officer Shaw AREVA MOX Services Savannah River Site P.O. Box 7097 Aiken, SC 29804-7097

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY – NRC TEAM INSPECTION REPORT 70-3098/2008-005

Dear Mr. Stinson:

During the period March 31 through April 4, 2008, the U. S. Nuclear Regulatory Commission (NRC) conducted a reactive team inspection of Energy and Process (E&P) in Tucker, Georgia and at the Mixed Oxide Fuel Fabrication Facility at the Savannah River Site. This reactive team inspection was sent in response to the identification of a large quantity of nonconforming reinforcing steel purchased for the Mixed Oxide Fuel Fabrication Facility. The purpose of the inspection was to determine whether activities authorized by the construction authorization regarding purchase of parts and components for installation into items relied on for safety (IROFS) were conducted safely and in compliance with NRC requirements. The results of the inspection of E&P on March 31 through April 2 are contained in inspection report 999-00866/ 2008-001. This inspection report can be found at the ADAMS internet address listed below. The enclosed inspection report documents the inspection results, for the period April 3 and 4, 2008, at the Mixed Oxide Fuel Fabrication Facility, hereafter referred to as MOX Services, which were discussed on April 4, 2008, with you and members of your staff.

The reactive inspection examined activities under your construction authorization as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your authorization. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. Based on the results of this inspection, no violations of NRC requirements were identified at MOX Services.

In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," this document may be accessed through the NRC's public electronic reading room, Agency-Wide Document Access and Management System (ADAMS) in the Internet at http: <u>www.nrc.gov/reading-rm/adams.html</u>.

Should you have any questions concerning this letter, please contact us.

Sincerely,

/RA/

Mark S. Lesser, Chief, Construction Inspection Branch 1 Division of Construction Inspection

Docket No. 70-3089 Construction Authorization No. CAMOX-001

Enclosure: NRC Inspection Report 07003098/2008-005 w/ attachment

cc: w/encl: (See page 3)

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cc: w/encl: (See page 3)

PUBLICLY AVAILABLE

NON-PUBLICLY AVAILABLE

NON-SENSITIVE

ADAMS: • Yes ACCESSION NUMBER: ML081340672

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SIGNATURE	JOC	Via Email	BLB	Via Email	Via Email	Via Email	
NAME	JCalle	JTapia	BBurgess	PBell	KHeck	DPasquale	
DATE	5/13/2008	04/29/08	4/12/2008	04/28/2008	04/28/2008	4/29/2008	
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<u>cc w/encl:</u> Garrett Smith, NNSA/HQ NA-261/Forrestal 1000 Independence Ave., SW Washington, DC 20585

A.J. Eggenberger, Chairman Defense Nuclear Facilities Safety Board 625 Indiana Ave., NW Suite 700 Washington, DC 20004

Joseph Olencz, NNSA/HQ 1000 Independence Ave., SW Washington, DC 20585

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Glenn Carroll Nuclear Watch South P.O. Box 8574 Atlanta, GA 30306

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Letter to D. Stinson from Mark Lesser dated May 13, 2008

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY – NRC INSPECTION REPORT 70-3098/2008005

Distribution w/encl:

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No:	70-3098	
Construction Authorization No:	CAMOX-001	
Report No:	07003098/2008-005	
Certificate Holder:	Shaw AREVA MOX Services	
Location:	Savannah River Site Aiken, South Carolina	
Inspection Dates:	April 3 – April 4, 2008 (March 31 – April 2, 2008 at Energy and Process; Inspection Report 99900866/2008-001)	
Inspectors:	 B. Burgess, Senior Project Manager, Construction Projects Branch 2, (CPB2), Division of Construction Projects (DCP), Region II (RII) J. Tapia, P.E., Senior Reactor Inspector, Construction Inspect Branch 2, (CIB2), Division of Construction Inspection (DCI), J. Calle, P.E., Senior Construction Inspector, CIB2, DCI, RII P. Bell, Senior Quality Assurance Engineer, Fuel Cycle Safet and Safeguards (FCSS), Office of Nuclear Materials Safety Safeguards (NMSS), Headquarters (HQ) K. Heck, Reactor Operations Engineer, Construction Quality Vendor Branch (CQVB), Division of Construction Inspection Program (DCIP), Office of Nuclear Reactor (NRO), HQ D. Pasquale, Senior Operations Engineer, CQVB, DCIP, NRO HQ 	
Approved:	Mark S. Lesser, Chief Construction Inspection Branch 1 Division of Construction Inspection	

EXECUTIVE SUMMARY

Shaw AREVA MOX Services Mixed Oxide Fuel Fabrication Facility NRC Inspection Report No. 70-3098/2008-005

This reactive inspection was performed in response to the identification of a large quantity of nonconforming reinforcing steel purchased for MOX Services. This team inspection consisted of specialists from the Office of New Reactors (NRO), the Office of Nuclear Materials Safety and Safeguards (NMSS), and Region II. The team inspection involved observation and evaluation of the oversight provided by MOX Services of Energy & Process' (E&P) procurement, storage and distribution of items relied on for safety (IROFS) during construction of the facility. The team inspection also evaluated the identification, analysis and resolution of problems in accordance with the MOX Projects Quality Assurance Plan (MPQAP), including application of 10 CFR Part 21. The scope of the inspection was consistent with the guidance contained in inspection procedure (IP) 88115, Supplier/ Vendor Inspection (Construction Phase). The following areas were addressed during this inspection:

Purchasing Processes

The inspection team concluded that appropriate actions had been implemented by MOX Services to control the purchase of items relied on for safety from E&P. The inspectors determined that quality related documents including, drawings, specifications, inter-disciplinary reviews, routing slips and related correspondence, were being effectively posted in the "e-room." No violations were identified.

Surveillances

The inspection team concluded that the surveillance program at MOX Services was being implemented consistent with the MPQAP. No violations were identified.

Audits

The inspection team concluded that MOX Services (Shaw/AREVA) was applying appropriate corrective actions to the July 2006 audit of E&P by Duke, Cogema, Stone and Webster, which the team determined was deficient. Duke, Cogema, Stone and Webster was the authorized constructor of the MOX Services facility during the 2006 time frame. A condition report was written to address the deficient 2006 audit. In addition, MOX Services will evaluate adequacy of other audits performed by Duke, Cogema, Stone and Webster prior to January 2007. January 2007 was the transition from Duke Cogema, Stone and Webster to Shaw/AREVA. No violations were identified.

Quality Affecting Item Procurement and Commercial Grade Item Dedication Process (IP 88114)

The inspection team determined that MOX Services had identified numerous problems with items supplied by E&P through a dedication process as basic components. Although MOX Services Quality Assurance (QA) personnel did not formally document the fact that commercial grade dedication of items supplied by E&P was in doubt and that each commercial grade dedication must be verified, the noted deficiencies were entered promptly into the corrective

action program (CAP). MOX Services had already drafted commercial grade dedication packages for reinforcing steel and other items procured through E&P. No violations were identified.

Corrective Actions

The inspectors verified that nonconforming items and deficiencies were evaluated for potential adverse effects, including the performance of a root-cause analysis for significant conditions adverse to quality, and that appropriate 10 CFR Part 21 evaluations and notifications were completed for defects and noncompliances. The inspection team identified that MOX Services had effectively quarantined the subject material, notified the supplier of the nonconforming condition and completed a thorough extent of condition review of the nonconforming rebar, including analysis of the worst case condition. On April 4, 2008, MOX Service submitted a voluntary Part 21 to the NRC addressing the nonconforming reinforcing steel supplied by E&P. No violations were identified.

Report Details

1.0 Purchasing Processes

a. Inspection Scope

This team inspection evaluated the procedures maintained by MOX Services to provide guidance for several anticipated purchasing scenarios against the requirements of NQA-1, 1994, including 1995 addenda and 10 CRF 50 Appendix B as outlined in the MOX Projects Quality Assurance Plan (MPQAP), Revision 5. The evaluation included a review of those procedures applicable to the procurement of rebar from Energy and Process (E&P) in Tucker, Georgia. Additionally, an assessment of MOX Services' Approved Suppliers List (ASL) was performed to verify that it had been updated to adequately reflect current performance issues. The inspection team also performed an assessment of the MOX Services' electronic exchange of purchasing related documentation referred to as the "e-room."

b. Observations and Findings

The team inspection noted that the MOX Services MPQAP integrates the elements of NQA-1 and 10 CFR 50 Appendix B, Criterion IV and is the governing quality document for the project. Section 10, "Procurement" of the MPQAP contains the implementing documents used to incorporate the MPQAP quality assurance (QA) aspects into the project's procurement activities. During the inspection of procurement activities at MOX Services, the inspectors identified that a conditional clause had been applied to E&P's ASL record stating that "until adequate performance and quality improvements are implemented and realized regarding rebar fabricated and shipped to the MOX Services facility, no additional contract awards are to be made to E&P until released by the MOX Services QA Department." This statement was in response to a number of deficient conditions identified by MOX QA personnel regarding receipt of material from E&P. The inspection team concluded that appropriate actions had been implemented by MOX Services to control the purchase of items relied on for safety from E&P.

The inspection also reviewed the "e-room" used for control of MOX Service documents. The inspectors identified that the "e-room" was a unique area of the project's electronic document control database, specially designated as the interchange mechanism to securely transfer documents back and forth between the project and the supplier. It was observed by the inspectors that quality related documents including, drawings, specifications, inter-disciplinary reviews, routing slips and related correspondence, were being effectively posted in the e-room and that comments and review status were being adequately captured and controlled.

c. <u>Conclusions</u>

The inspection team concluded that appropriate actions had been implemented by MOX Services to control the purchase of items relied on for safety from E&P. The inspectors determined that quality related documents including, drawings, specifications, inter-disciplinary reviews, routing slips and related correspondence, were being effectively posted in the "e-room." No violations were identified

2.0 Surveillances

a. Inspection Scope

The inspectors reviewed the following documents: applicant plans and activities relating to contractor surveillance objectives, information on previous deficiencies including planned corrective actions, and surveillance plans for adequacy including scope and overall surveillance objectives. The inspectors also evaluated the adequacy of MPQAP implementation relating to the applicants conduct of surveillance activities including a pre-surveillance conference, execution of surveillances, identification and summarization of deficiencies and follow-up of corrective actions.

b. Observations and Findings

The inspection team concluded that the surveillance program at MOX Services was being implemented consistent with the MPQAP. No specific observations or findings were identified in the area of surveillances.

c. Conclusions

The inspection team concluded that the surveillance program at MOX Services was being implemented consistent with the MPQAP. No violations were identified.

3.0 Audits

a. Inspection Scope

The inspection team reviewed and verified that audits performed by MOX Services were performed in a manner consistent with the requirements specified in MPQAP. The inspectors also reviewed the MOX ASL and other related audit activities for parts supplied by E&P.

b. Observations and Findings

The inspection team reviewed the last audit performed in 2006 by Duke, Cogema, Stone and Webster of E&P and the accompanying Audit Report Energy and Process (EAP)-06-VE10. Duke, Cogema, Stone and Webster was the authorized constructor of the MOX Services facility during the 2006 time frame. The July 2006 audit was used to determine that the commercial grade dedication program at E&P was acceptable for purchase of Appendix B and NQA-1 parts. The inspection team discussed with MOX Services (Shaw/AREVA) a number of concerns developed by the team regarding E&Ps lack of capabilities to perform commercial grade dedication for Appendix B and NQA-1 parts. After discussion with the NRC team regarding the adequacy of the 2006 audit performed by Duke, Cogema, Stone and Webster, MOX Services (Shaw/AREVA) issued Condition Report No: 20080139. In this condition report, MOX Services also indicated that they will reevaluate the adequacy of dedication process used by E&P to dedicate commercial grade items. MOX Services (Shaw/AREVA) will also review any audit reports performed by Duke, Cogema, Stone and Webster prior to January 1, 2007, to determine the adequacy of vendor QA programs approved to provide basic parts.

c. Conclusions

The inspection team concluded that MOX Services (Shaw/AREVA) was applying appropriate corrective actions to team identified deficient July 2006 audit of E&P by Duke, Cogema, Stone and Webster. Duke, Cogema, Stone and Webster was the authorized constructor of the MOX Services facility during the 2006 time frame. A condition report was written to address the deficient 2006 audit. In addition, MOX Services (Shaw/AREVA) will evaluate adequacy of other audits performed by Duke, Cogema, Stone and Webster prior to January 2007. No violations were identified.

4.0 Quality Affecting Item Procurement and Commercial Grade Item Dedication Process (IP 88114)

a. Inspection Scope

The inspectors reviewed various documents generated by the certificate holder covering the issue with the deficient items supplied by E&P. Specifically, documents discussing deficiencies with E&P's commercial grade dedication of rebar, plate and piping supplied to MOX Services were reviewed.

b. Observations and Findings

The inspectors determined that the certificate holder's assessment of E&P's commercial grade dedication of the supplied items clearly identified significant deficiencies. MOX Services response to this assessment included separating the questionable material and conducting their own evaluation and verification of the material and dimensional characteristics. Once these actions were completed and determined acceptable, the items in question were re-released for field installation.

The team identified that audits and surveillances of E&P completed by MOX Services QA personnel identified numerous deficiencies with the dedication of commercial grade items. In 2007 through 2008, MOX services had written approximately 83 nonconformance reports against E&P for various deficiencies. MOX Services' assessment of E&P's commercial grade dedication process brought into guestion the validity of the commercially supplied items being classified, after E&P dedication, as guality level 1 (QL-1) for use as an IROFS. The MPQAP, Section 7.2.12, Commercial Grade Items, requires that a commercial grade item undergo a commercial grade dedication process prior to classification as QL-1 for use as an IROFS. MOX Services did not formally document the fact that commercial grade dedication of items supplied by E&P was in doubt and that the commercial grade dedication must be verified. However, given the prompt response by MOX Services to document this issue in the corrective action program and with the number of corrective actions already in progress, including the development of commercial grade dedication packages for reinforcing steel and other items procured through E&P, this issue was considered by the team to be adequately addressed. MOX is in the process of initiating a program to trend nonconforming items with the intent of responding more quickly to supplier issues that exhibit common cause attributes.

c. Conclusions

The inspection team determined that MOX Services had identified numerous problems with items supplied by E&P. Although MOX Services Quality Assurance (QA) personnel did not formally document the fact that commercial grade dedication of items supplied by E&P was in doubt and that each commercial grade dedication must be verified, the noted deficiencies were entered promptly into the corrective action program (CAP). MOX Services had already drafted commercial grade dedication packages for reinforcing steel and other items procured through E&P. No violations were identified.

5.0 Corrective Actions

a. Inspection Scope

The inspectors verified that nonconforming items and deficiencies were evaluated for potential adverse effects, including the performance of a root-cause analysis for significant conditions adverse to quality, and that appropriate 10 CFR Part 21 evaluations and notifications were performed for defects and noncompliances. Specifically, the inspection verified that the nonconforming reinforcing steel was evaluated for potential adverse effects and included a review of 10 CFR Part 21 requirements. The inspectors also reviewed MOX Services Surveillance and Nonconformance Reports related to items supplied by E&P.

b. Observations and Findings

The MOX Services disposition of the Nonconformance Report related to the reinforcing steel was to reject the defective bars, notify the supplier of the nonconforming condition and to evaluate, by calculation, the impact of the defect on installed concrete placements. The MOX Services review of the extent of condition was thorough. The assessment of potential impact was addressed by performing an ANSYS stress analysis with the worse case condition defined. The inspectors reviewed the analysis and determined that it provided technical justification for the acceptance of reinforcing steel already installed. On April 4, MOX Services submitted a voluntary 10 CFR Part 21 to the NRC addressing the nonconforming reinforcing steel supplied by E&P.

c. <u>Conclusions</u>

The inspection team identified that MOX Services had effectively quarantined the subject material, notified the supplier of the nonconforming condition and completed a thorough extent of condition review of the nonconforming rebar, including analysis of the worst case condition. On April 4, 2008, MOX Services submitted a voluntary 10 CFR Part 21 to the NRC addressing the nonconforming reinforcing steel supplied by E&P. No violations were identified.

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Shaw Areva MOX Services

- D. Stinson, President and Chief Operating Officer
- W. Elliot, Engineering Vice President
- J. Adair, Civil- Mechanical Engineering Manager
- G. Shell, Quality Assurance Manager
- N. Simpson, MOX Services Licensing
- D. Yates, MOX Services Licensing
- D. Kehoe, QA Engineer
- R. Whitley, Supplier QA Manager

National Nuclear Security Administration

S. Glen, Project Engineer

INSPECTION PROCEDURES (IPS) USED

- IP 88155 Supplier/Vendor Inspection (Construction Phase)
- IP 88114 Quality Affecting Item Procurement and Commercial Grade Item Dedication Process

ITEMS OPENED, CLOSED, AND DISCUSSED

None

PARTIAL LIST OF DOCUMENTS REVIEWED

Miscellaneous Documents

MOX Project Quality Assurance Plan (MPQAP) Rev. 5

Construction Specification, DCS01-BKA-DS-SPE-B-09328-3

Commercial Grade Item Evaluation for Concrete Reinforcement, DCS01-BKA-DS-CGD-M-65827-0

Commercial Grade Item Evaluation for Concrete Reinforcement, DCS01-UFJ-DS-CGD-T-12017-0

Engineering Change Request, ECR No. 000665, Rev. 0

MOX Purchase Order 10888-S1526

MOX Purchase Order 10888-S1383

Shaw AREVA MOX Services Approved Suppliers List, Revision 61, dated March 03, 2008

MOX Services FY 2008 Audit/Surveillance/Evaluation Schedule

MOX Services Audit of Energy and Process

MOX Services Technical Report on Reinforcing Bar Failing Minimum Bend Radius Requirements, February 26, 2008

MOX Services Calculation DCS01-XGA-DS-CAL-B-01102-0, "Technical Justification of Rebar Bend Diameter Inadequacy in Existing Concrete of BMF Structure," February 26, 2008

Procedures

MOX Procedure PP1 Quality Assurance Grading MOX Procedure PP3-7, Audits MOX Procedure PP3-11, Assessments MOX Procedure PP3-12, Supplier Evaluation MOX Procedure PP3-12, Supplier Evaluation MOX Procedure PP3-13, Supplier Verification MOX Procedure PP3-28, Quality Control Receiving Inspection MOX Procedure PP3-29, Inspection at Supplier Facilities MOX Procedure PP9-18 Commercial Grade Item Evaluations MOX Procedure PP10-5, Supplier/Subcontractor Pregualification MOX Procedure PP10-6, Interfacing with Suppliers/Subcontractors MOX Procedure PP10-8, Reguisitioning Items and Services MOX Procedure PP10-14, Vendor Submittal Management MOX Procedure PP10-25, Vendor Evaluation MOX Procedure PP10-29, MOX Subcontractor Purchase of Permanent Material MOX Procedure PP11-25. Control of QL1 and QL2 Material

Non-Conformances

Non-Conformance Report, EN-07-0048, Non-Conformance Report, EN-07-0053 Non-Conformance Report, EN-07-00812 Non-Conformance Report, EN-07-0082 Non-Conformance Report, EN-07-0083 Non-Conformance Report, EN-07-0085 Non-Conformance Report, EN-07-0087 Non-Conformance Report, EN-07-0091 Non-Conformance Report, EN-07-0097 Non-Conformance Report, EN-07-0118 Non-Conformance Report, EN-07-0134 Non-Conformance Report, EN-07-0143 Non-Conformance Report, EN-08-0173 Non-Conformance Report, QC-07-0001-S Non-Conformance Report, QC-07-0005-S Non-Conformance Report, QC-07-0006 Non-Conformance Report, QC-07-0011 Non-Conformance Report, QC-07-0012 Non-Conformance Report, QC-07-0019 Non-Conformance Report, QC-07-0028

Non-Conformance Report, QC-07-0029-S Non-Conformance Report, QC-07-0030 Non-Conformance Report, QC-07-0037 Non-Conformance Report, QC-07-0049 Non-Conformance Report, QC-07-0050 Non-Conformance Report, QC-07-0052 Non-Conformance Report, QC-07-0061 Non-Conformance Report, QC-07-0067 Non-Conformance Report, QC-07-0068 Non-Conformance Report, QC-07-0145 Non-Conformance Report, QC-07-0146 Non-Conformance Report, QC-07-0152 Non-Conformance Report, QC-07-0156 Non-Conformance Report, QC-07-0157 Non-Conformance Report, QC-07-0180 Non-Conformance Report, BK-08-0192 Non-Conformance Report, BK-08-0220 Non-Conformance Report, CE-07-0154 Non-Conformance Report, CE-08-0170 Non-Conformance Report, CE-08-0180-S Non-Conformance Report, CE-08-0198 Non-Conformance Report, CE-08-0209 Non-Conformance Report, QC-08-194 Non-Conformance Report, QC-08-0203S Non-Conformance Report, QC-08-0211 Non-Conformance Report, QC-08-0225 Non-Conformance Report, QC-08-0257 Non-Conformance Report, QC-08-0266 Non-Conformance Report, QC-08-0267 Non-Conformance Report, QC-08-0268 QC Receiving Inspection Report, QC-RIR-08-067 QC Receiving Inspection Report, QC-RIR-08-077

Surveillances

Surveillance Report, EAP-07-0023 Surveillance Report, EAP-07-VS12 Surveillance Report, EAP-07-VS15 Surveillance Report, EAP-07-VS71 Surveillance Report, EAP-07-VS73 Surveillance Report, EAP-07-VS13 Surveillance Report, QC-07-0055 Surveillance Report, QC-07-0059 Surveillance Report, QC-07-0060 Surveillance Report, QC-07-0061 Surveillance Report, QC-07-0062 Surveillance Report, QC-07-0098 Surveillance Report, QC-08-VS16 Surveillance Report, QC-08-VS18 Surveillance Report, QC-08-VS18 Surveillance Report, EAP-08-VS26

Supplier Deficiency Reports

Supplier Deficiency Report, EAP-07-VS12-01 Supplier Deficiency Report, EAP-07-VS71-01 Supplier Deficiency Report, EAP-07-VS72-01 Supplier Deficiency Report, EAP-08-VS13-01 Supplier Deficiency Report, EAP-08-VS16-02 Supplier Deficiency Report, EAP-08-VS16-02 Supplier Deficiency Report, EAP-08-VS18-02 Supplier Deficiency Report, EAP-08-VS18-02 Supplier Deficiency Report, EAP-08-VS25-01 Supplier Deficiency Report, EAP-08-VS25-01

LIST OF ACRONYMS USED

ASLApproved Supplier ListCAPCorrective Action ProgramE&PEnergy and Process CorporationEAPEnergy and Process CorporationIROFSItems Relied On For SafetyMOX ServicesShaw/AREVA Mixed Oxide Fuel Fabrication FacilityMPQAPMOX Project Quality Assurance PlanNMSSOffice of Nuclear Materials Safety and SafeguardsNRCNuclear Regulatory CommissionNROOffice of New ReactorsQAQuality AssuranceQCQuality ControlQL-1Quality Level 1	ADAMS	Agency Wide Document Access and Management System
E&PEnergy and Process CorporationEAPEnergy and Process CorporationIROFSItems Relied On For SafetyMOX ServicesShaw/AREVA Mixed Oxide Fuel Fabrication FacilityMPQAPMOX Project Quality Assurance PlanNMSSOffice of Nuclear Materials Safety and SafeguardsNRCNuclear Regulatory CommissionNROOffice of New ReactorsQAQuality AssuranceQCQuality Control	ASL	Approved Supplier List
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QC Quality Control	NRO	Office of New Reactors
	QA	Quality Assurance
QL-1 Quality Level 1	QC	Quality Control
	QL-1	Quality Level 1