

**Proposed Mixed Oxide Project**  
**Quality Assurance Plan Changes**  
**Introduction**

- Separate items relied on for safety (IROFS) into Safety Importance – LOW, MEDIUM, HIGH.
- Safety function will be verified for all IROFS.
- The approach ensures the Quality Assurance (QA) controls are established commensurate with importance to safety.
- Any activities performed in safety ranking process and assignment of QA controls will be documented, reviewed and approved in accordance with project procedures. The documentation will be maintained as a permanent QA record.
- Design change control process will require review of the safety ranking evaluations.
- Corrective Action trending and lessons learned will be used to determine whether QA Program Controls applied to high, medium and low safety ranked IROFS requires adjustment.
- All IROFS, including those ranked as low importance to safety, are required to comply with the mixed project quality assurance plan (MPQAP) with the proposed changes.

## MPQAP SECTION 2.0

### **CHANGES TO MPQAP**

Add to Section 2.2.2

QL-1LR is a subset of QL-1 IROFS where the importance to safety is low.

Add to Section 2.2.3.B

Add "Degree of Standardization"

Replace Section 2.2.3.C with:

#### **IROFS Importance to Safety Ranking Process and Application of QA Controls**

The purpose of this process is to define relative importance of IROFS to the overall safety criteria for the application of graded QA controls. Those items that result in high/medium importance will be maintained as QL-1 IROFS with all associated QA controls as defined in the MPQAP. Those that are defined as low safety importance will be identified in the IROFS database as QL-1LR and QA controls will be applied commensurate with the IROFS importance to safety.

The process is applied to individual IROFS control groups as identified in nuclear safety evaluations. Each ranking criteria is scored according to its importance to safety with justification for the selection. The overall importance to safety ranking for the control group is determined with the use of the importance matrix. If an IROFS performs multiple safety functions, then there must be an evaluation for each and the highest importance ranking score is assigned. The evaluation is documented, reviewed, approved and maintained as a QA record. The IROFS database is updated with the results. Design changes subsequent to the evaluation are reviewed to determine the impact on the importance to safety evaluation results.

The importance to safety ranking criteria is based on the relative likelihood and consequences of IROFS failure.

The likelihood criteria are:

- Likelihood of the initiating event
- Reliability of the IROFS control group
- Surveillance of the IROFS
- The safety margin from normal operations to the safety limit

The consequence criteria are:

- Monitoring versus controlling function of the IROFS
- The consequences associated with the IROFS control group failure
- The safety margin from the safety limit to the event consequences
- The additional protection features

The grading process used on QL-1 SSCs determines the QA controls applied based on the relative importance of IROFS as determined in the evaluation. Those items that result in high/medium importance will be maintained as QL-1 IROFS with all associated QA controls. Those identified as low importance will be identified as QL-1LR for the application of graded controls. These evaluations are performed and documented using approved procedures.

The results of the application of the graded approach to quality are incorporated into design requirements documents, specifications, procedures, instructions, drawings, inspection plans, test plans, procurement documents and other documents that establish the requirements for items and activities. The specific application of graded QA controls is discussed in Sections 2.0, 3.0, 4.0, 7.0, 10.0, 17.0 and 18.0 of the MPQAP.

## **REQUIREMENTS**

- MPQAP Section 2.2.3.C currently allows the use of augmented QA Programs for IROFS. Augmented Quality Programs are grading at the program level.
- Title 10 of the *Code of Federal Regulations* (10 CFR) 50 Appendix B Criteria 2 states, "The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistence with their importance to safety."The safety ranking process provides a more efficient and effective means of determining the safety importance.

## **PRECEDENCE**

- There is currently industry precedence for using grading based on importance to safety:
  - Quality Assurance Program Description for the American Centrifuge Plant (ACP), Docket No. 70-7004, August 2004 (including NRC Safety Evaluation Report [SER])
  - Louisiana Energy Service (LES) License Amendment Request (LAR) December 23, 2010, as approved by the NRC
  - 10 CFR 50.69, *Risk-Informed Categorization and Treatment of Structures Systems and Components for Nuclear Power Reactors*

- Regulatory Guide 1.189, *Fire Protection for Operating Nuclear Power Plants*
- Regulatory Guide 1.143, *Radioactive Waste Management Systems*
- Regulatory Guide 4.15, *Radiological Monitoring Programs*

## MPQAP SECTION 3.0

### **CHANGES TO MPQAP**

#### Add to Section 3.2.3.O

When QL-1LR IROFS are procured commercially, Engineering will identify the critical attributes, verification method and acceptance criteria in the procurement document or specification. The basis for selection of critical attributes shall be documented and approved.

### **REQUIREMENT**

- Safety function verification methodology.
- Engineering is responsible to define the verification requirements
- Improved efficiency without compromising the safety objectives
- The design related activities required to support this approach shall be defined in project procedures and shall be carried out in compliance with current MPQAP requirements.
- The design requirements will be documented in design output and will be maintained as project QA records.

## MPQAP SECTION 4.0

### **CHANGES TO MPQAP**

Add as Section 4.2.1.B.5

QL-1LR IROFS that are procured as commercially available items will use the criteria of this section and the criteria for commercial grade dedication as detailed in Section 7.0. These items will be designated as a basic component at final acceptance.

### **REQUIREMENT**

- Using criteria similar to commercial grade dedication ensures verification/verification method of the safety function
- Reinforces MOX Services commitment for QL-1 and QL-1LR IROFS to be “basic components”
- Regarding Commercial Procurements:
  1. Design requirements shall be specified in design output documents
  2. To ensure safety function is demonstrated the specification specifies the critical attributes, verification method and acceptance criteria.
  3. Receipt inspection verifies satisfactory accomplishment of verification to stated acceptance criteria. Where post installation testing is used these will be tracked using verification actions in accordance with project procedures.
  4. When determined necessary by Engineering, such as for complex items, supplier selection and evaluation will be performed.
  5. The method for verification will be inspection or test; supplier performance, source inspection, survey or a combination of these methods.

### **PRECEDENCE**

- Quality Assurance Program Description for the ACP, Docket No. 70-7004, August 2004 (including NRC SER)
- LES LAR December 23, 2010, as approved by the NRC
- 10 CFR 50.69, *Risk-Informed Categorization and Treatment of Structures Systems and Components for Nuclear Power Reactors*
- Regulatory Guide 1.189, *Fire Protection for Operating Nuclear Power Plants*
- Regulatory Guide 1.143, *Radioactive Waste Management Systems*
- Regulatory Guide 4.15, *Radiological Monitoring Programs*

## MPQAP SECTION 7.0

### **CHANGES TO MPQAP**

Add Section 7.2.6.1.C (move current C to D)

QL-1LR IROFS procured as commercially available items may be accepted based on the following:

1. A nationally recognized accreditation such as Factory Mutual (FM) or Underwriters Laboratory (UL)
2. A recognized accreditation service such as National Ready Mixed Concrete Association (NRMCA) or signatories to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Agreement (MRA)
3. Supplier provided commercial documentation with over-checks from MOX Services such as using Positive Material Identification to validate material properties.

Add Section 7.2.6.4 G

1. For QL-1LR items where sampling is utilized in the performance of receipt inspection, reduced sampling is accepted when authorized by Engineering.

### **REQUIREMENT**

- Use of accreditation ensures processes/approach has been validated by independent sources
- Independent checks will provide added assurance that the product and submitted documentation are acceptable.
- Sample sizes will be sufficient to ensure compliance. Reduced sampling is consistent with low importance to safety ranking
- When accreditation is used as the basis for supplier selection, the following criteria will be met:
  1. The accreditation organization must be a recognized nationally/internationally accreditation body.
  2. For manufactured items acceptance of the item includes evaluation of the design and satisfactory completion of testing.
  3. The acceptance of items and/or services includes evaluation of quality process including on site evaluation of process execution.
  4. The continued acceptance of the item and/or services requires periodic re-verification.

## **PRECEDENCE**

- Regulatory Guides 4.15, 1.189 and 1.143 allows the use of material testing reactor for certified material test report for material verification.
- MOX Services investigation to NRC finding established confidence in material test reports.



## MPQAP SECTION 10.0

### **CHANGES TO MPQAP**

Add to Section 10.2.2 C (move current C to D)

Peer Inspections – Inspection of QL-1LR installation and fabrication activities, except for connections to QL-1 items, may be performed by personnel approved by the responsible organization and consistent with procedure requirements.

### **REQUIREMENT**

- Inspection requirements, with the possible exception of using reduced sampling as authorized by Engineering, are not affected by this approach.
- Peer inspectors shall not have been involved with the performance of the work activity to be inspected and shall not report to the immediate supervisor responsible for the work activity.
- Peer inspectors will be qualified based on experience, training and/or proficiency demonstration per project procedures.
- Inspections and results will be documented.
- Unsatisfactory results shall be identified, documented in the corrective action program and resolved.

### **PRECEDENCE**

- Regulatory Guide 1.189 addresses peer inspection in Section 1.7.4, *Inspection* states “measures to ensure that inspection personnel are independent from the individuals performing the activity being inspected ...”
- Regulatory Guide 1.33, *Quality Assurance Program Requirements (Operation)*, adopts ANSI N18.7-1976/ANS-3.2, *Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants*. Section 5.2.17 of ANSI N18.7-1976/ANS-3.2 addresses inspection.

## MPQAP SECTION 17.0

### **CHANGES TO MPQAP**

Add to Example Tables in Section 17.0

Add Safety Ranking Reports as an example of a Lifetime QA record.

### **REQUIREMENTS**

- This is covered in the justification for changes made to Section 2.0

## MPQAP SECTION 18.0

### **CHANGES TO MPQAP**

Add new paragraph under section 18.2 prior to 18.2.1

Oversight of items and activities will utilize the following approach:

1. Performance monitoring, surveillance and assessments are the primary oversight methods for QL-1LR items and activities

Audits will be focused on the QL-1 items and activities not covered in 1) above

### **REQUIREMENTS**

- Safety ranking enhances ability to focus audits on structures, systems and components which have the most importance to safety
- Oversight of QL-1LR is assessed by using less formal approaches
- Performance will continue to be validated and problems will be identified in accordance with Section 15.0 and 16.0 of the MPQAP