



10 CFR 70.5

March 1, 2011

AES-O-NRC-11-00840

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

AREVA Enrichment Services LLC  
Eagle Rock Enrichment Facility  
NRC Docket No: 70-7015

Subject: Response to Request for Additional Information for Revised Quality Assurance Program Description

On September 10, 2010 (Reference 1), AREVA Enrichment Services LLC (AES) submitted Revision 4 of the Quality Assurance Program Description (QAPD) to incorporate revised definitions and associated definition clarifications pertaining to Part 21 and to implement a revised commercial grade item procurement strategy and dedication process and implementing procedures.

The NRC reviewed Revision 4 of the QAPD and requested additional information (RAI) by letter dated February 2, 2011 (Reference 2). The purpose of this letter is to provide responses to the fourteen questions contained in the RAI.

We trust the additional information and clarifications provided resolves the NRC questions. If you have any further questions regarding this submittal, please contact me at (508) 573-6554.

Respectfully,

A handwritten signature in black ink that reads 'James A. Kay'.

James A. Kay  
Licensing Manager

References:

1. James A. Kay (AES) Letter to the U.S. Nuclear Regulatory Commission, Revised Quality Assurance Program Description Incorporating the 10 CFR Part 21 Exemption, dated September 10, 2010.
2. M. Breeda Reilly (U.S. Nuclear Regulatory Commission) Letter to James A. Kay (AES), Request for Additional Information for AREVA Enrichment Services Eagle Rock Enrichment Facility Revised Quality Assurance Program Description Incorporating the 10 CFR Part 21 Exemption, dated February 2, 2011.

**AREVA ENRICHMENT SERVICES LLC**

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AREVA Enrichment Services LLC  
AES-O-NRC-11-00840  
Page 2 of 2

Enclosures: 1. Response to Request for Additional Information  
2. Markup Pages for the EREF QAPD

Commitment: The EREF QAPD markup pages will be included in Revision 5 of the QAPD that will accompany Revision 3 of the EREF License Application.

cc: Breeda Reilly, U.S. NRC Senior Project Manager

The following AREVA Enrichment Services (AES) responses are provided to the fourteen Requests for Additional Information (RAIs) provided to AES by letter dated February 2, 2011.

**NRC RAI QAPD 1:**

Section 2.1 of the Quality Assurance Program Description (QAPD), "Quality Assurance Program," states for quality assurance (QA) Level 1 that for items relied on for safety (IROFS) that contain a Safe-by-Design attribute, only the attribute is considered to be QA Level 1. Please clarify how this description will apply to commercial grade items.

**AES Response to NRC RAI:**

For IROFS that contain a Safe-by-Design attribute, the attribute will require verification by means of a documented inspection using qualified inspectors and appropriate instruments calibrated in accordance with QAPD Section 12 requirements. If the component is procured as a Commercial Grade Item, then a Commercial Grade Dedication Plan will be developed that identifies the Critical Characteristics requiring verification to achieve a proper dedication. The method or methods chosen (Source Inspection, Commercial Survey or Receipt Inspection) would depend upon the equipment suppliers QA Program capabilities.

**NRC RAI QAPD 2:**

Please clarify if Section 1.0, "Introduction and Organization" and Section 2.0, "Quality Assurance Program" of the QAPD are applicable to fire protection systems.

**AES Response to NRC RAI:**

QAPD Sections 1.0 and 2.0 apply to all fire protection structures, systems, and components credited as IROFS. The specific elements of the QAPD that have been modified in QAPD Revision 4 are applicable to QA Level FP IROFS100 only (pre-action fire sprinkler systems). All other fire protection IROFS will conform to all requirements of the QAPD consistent with their assigned quality level (QA Level 1 or QA Level 2), as appropriate. Section A.2.0 has been added to the QAPD Appendix in Enclosure 2 to state that Section 1.0 of the QAPD applies and Section 2.0 of the QAPD applies with the clarification for QA Level FP. In addition, the definition of QA Level FP will be revised in QAPD Section 2.1 to state that QA Level FP items applies only to automatic fire suppression systems located in buildings and/or over areas containing licensed material-at-risk, which if released could exceed 10 CFR 70.61 performance requirements, and are designated as IROFS to satisfy 10 CFR 70.64(b) requirements.

**NRC RAI QAPD 3:**

Section A.1 of Appendix A to the QAPD states the following:

"Those fire protection structures, systems, and components (SSCs) designated as QA Level Fire Protection (FP) IROFS will be:

1. Designed, specified, procured, installed, and tested in accordance with requirements of the applicable NFPA code and/or standard(s) (see exceptions to IROFS commitments below),
2. Listed and/or approved by an independent agency such as Underwriters Laboratories, Factory Mutual, or other acceptable agency except in cases where such listing/approval is not required by NFPA code/standard (e.g., sprinkler piping is not required to be listed),
3. Inspected on receipt consistent with QAPD requirements to verify compliance to the criteria specified above.”

From the statement above please clarify the following:

1. Please list the specific National Fire Protection Association (NFPA) codes and standards that will be considered the codes of record for fire protection systems at the facility.
2. Please clarify how the independent agencies (Underwriter Laboratories, Factory Mutual, etc.) will be verified for acceptance of items and services.
3. Please clarify which QAPD requirements will be used during receipt inspection to verify compliance that the QA Level FP IROFS are designed, specified, procured, installed and tested in accordance with the applicable NFPA Code.

**AES Response to NRC RAI:**

**Item 1** - The NFPA codes of record are those cited in SAR Section 3.3.7 and SAR Table 3.3-10. The edition year of record will be those in force and effect at the time the relevant IROFS Fire Protection Systems are submitted to Bonneville County, Idaho for construction permitting.

**Item 2** - AES does not intend to verify the agencies. The agency approval processes in use by Underwriter Laboratories (UL)/ Factory Mutual (FM) to place specific vendors and products in the Fire Protection Equipment Directory and/or the FM Approval Guide are commercial grade and are considered adequate for QA Level FP components.

**Item 3** - AES will confirm that QA-FP IROFS are designed, procured, installed and tested in accordance with applicable NFPA Codes and Specifications by application of the QAPD in the following areas:

- QAPD Section 2.0, Quality Assurance Program, for use of Qualified Inspection and Test Personnel,
- QAPD Section 3.0, Design Control, with the exceptions as noted in Appendix A,
- QAPD Section 4.0, Procurement Document Control, with the exceptions as noted in Appendix A (as will be modified by this letter which indicates AES will revise Appendix A to indicate this criteria is applicable with the exception of paragraphs 4.2 and 4.3),

- QAPD Section 5.0, Instructions, Procedures or Drawings, ensuring the use of approved instructions, procedures and drawings during receipt inspection, installation and testing,
- QAPD Section 6.0, Document Control, to ensure inspections are performed to the latest approved procurement and design documents,
- QAPD Appendix A, Section A.2.6 which specifies QA Level FP Items shall be receipt inspected,
- QAPD Section 8.0, Identification and Control of Items, to identify the status of the received item(s),
- QAPD Section 10.0, Inspection, for documenting of receiving inspection activities, installation and testing activities,
- QAPD Section 11.0, Test Control, for specifying and documenting of test activities,
- QAPD Section 12.0, Control of Measuring and Test Equipment, for use of calibrated instruments where applicable in performing inspection or testing activities (as modified by this letter which indicates AES will revise Appendix A to indicate this criteria is applicable without exception),
- QAPD Section 13.0, Handling, Storage and Shipping, requirements,
- QAPD Section 14.0, Inspection, Test and Operating Status,
- QAPD Section 15.0, Control of Nonconforming Items, for the identification of nonconforming conditions identified at receipt inspection,
- QAPD Section 16, Corrective Action, if nonconforming conditions identified at receipt, during installation or testing indicate corrective actions are required, with the exception of 10CFR Part 21 reportability as noted in Appendix A,
- QAPD Section 17, Quality Assurance Records, for storage and retention of supplier documentation and receiving inspection records,
- QAPD Section 18, Audits, for conducting internal audit activities during design, procurement, installation, testing, maintenance and operations.

#### **NRC RAI QAPD 4:**

Section A.2.1 of Appendix A to the QAPD states, "Automatic fire suppression systems located in buildings and/or over areas containing licensed material-at-risk, which if released could exceed 10 CFR 70.61 performance requirements, and are designated as IROFS to satisfy 10 CFR 70.64(b) requirements. These IROFS will be designated as QA Level Fire Protection (QA Level FP)." The cover letter dated September 10, 2010, for the Revised QAPD incorporating the 10 CFR Part 21 Exemption states "This new QA designation describes the QA requirements for automatic pre-action fire sprinkler."

1. Please clarify if the scope of Appendix A to the QAPD is only automatic pre-action fire sprinklers.
2. If Appendix A is only applicable to automatic fire suppression systems, please clarify the QA controls that will be used for other fire protection IROFS.

**AES Response to NRC RAI:**

**Item 1** - QA Level FP only applies to the automatic pre-action fire sprinklers. The definition of QA Level FP will be revised in QAPD Section 2.1 to state that QA Level FP items applies only to automatic fire suppression systems located in buildings and/or over areas containing licensed material-at-risk, which if released could exceed 10 CFR 70.61 performance requirements, and are designated as IROFS to satisfy 10 CFR 70.64(b) requirements.

**Item 2** - All other fire protection SSCs credited as IROFS will conform to QAPD requirements for QA Level 1 or QA Level 2, as appropriate.

**NRC RAI QAPD 5:**

Section A.2.2 of Appendix A to the QAPD states, "The requirement for design verification in accordance with American Society of Mechanical Engineers (ASME) Nuclear Quality Assurance (NQA)-1, 1994 edition, Supplement 3S-1 for methods of design verification including any one or a combination of the following, as defined in design reviews, alternate calculations, or the performance of qualification tests, is not applicable." The staff's interpretation of the NQA-1 reference in Section 3.4 of the QAPD was that it was guidance for implementation.

Please clarify the use of Supplement 3S-1 in the AES QA Program. Does AES commit to comply with Supplement 3S-1 of NQA-1-1994 for QA Levels 1 and 2 items under Section 3 of the QAPD, or is the ASME guidance used only for reference in developing QA requirements in the QAPD? The staff notes that it is clear that AES does not intend to commit to Supplement 3S-1 for FP IROFS.

**AES Response to NRC RAI:**

The staff's interpretation of the NQA-1 reference in Section 3.4 of the QAPD is correct. AES is not committing to Supplement 3S-1 for FP IROFS.

Additionally, AES has made reference to various portions of NQA-1 in:

- QAPD Section 2.4
- QAPD Section 3.4
- QAPD Section 3.6
- QAPD Section 11.5
- QAPD Section 17.3
- QAPD Section 17.9

It is AES's intent to utilize the ASME NQA-1 sections, as referred to in our QAPD, as guidance (not as a commitment) in the development of our procedures to control activities associated with the design, procurement, fabrication, testing and installation of IROFS. The QAPD will be modified accordingly to clarify this intent.

### **NRC RAI QAPD 6:**

Section A.2.3 of Appendix A to the QAPD states, "Section 4.0 is not applicable (e.g., Commercial Grade dedication and Part 21 do not apply). Procurement Document Control will be in accordance with applicable NFPA codes/standards and commercial grade practices."

Please clarify the following of the above statement:

1. Please clarify the intent of the following statement, "Commercial Grade dedication and Part 21 do not apply." There have not been any Part 21 exemption requests for reporting requirements issued for these components. Part 21 reporting requirements apply to all safety-related components that could create a substantial safety hazard and whose failure would exceed the performance requirements in 10 CFR 70.61.
2. Please describe the controls for Procurement Documents that are required by NFPA Codes and Standards. Please describe and justify any reduced level of QA procurement documentation control that will be provided for FP IROFS than that provided for QL-1 and QL-2 IROFS.

### **AES Response to NRC RAI:**

**Item 1** - AES does not believe an exemption from Part 21 is required for IROFS100 fire sprinkler systems as they do not require treatment as basic components under Part 21. NRC stated in their letter dated March 25, 2010:

*For new facilities, 10 CFR 70.64(b) requires that facility and system design and facility layout be based on defense-in-depth practices. The design must incorporate to the extent practicable a preference for the selection of engineering controls over administrative controls. For fire protection, this requirement can be met by selecting at least one engineered system to meet the 10 CFR 70.61 performance requirements for every fire-initiated sequence where practicable.*

AES in its response dated May 28, 2010, regarding quality assurance requirements for FP IROFS, stated the intention to treat QA Level FP IROFS consistent with commercial grade and good industry practice. As noted in that letter, fire sprinklers are being credited to meet the preference statement in 10 CFR 70.64(b) (selection of engineered controls over administrative controls to increase overall system reliability), not because they were necessary to meet the performance criteria of 10 CFR 70.61. Other in-place IROFS are available to meet the performance requirements of 10 CFR 70.61. Facility fires involving expected fire loads (in-situ and routine quantities of transient combustibles) have been evaluated in the EREF Fire Hazards Analysis and Integrated Safety Analysis Summary. These fire accident sequences were developed consistent with NUREG-1520 and with NFPA 801, *Standard for Fire Protection for Facilities Handling Radioactive Materials*, and shown to satisfy 10 CFR 70.61 performance requirements without crediting fire suppression systems as IROFS.

On this basis, AES does not consider the IROFS100 fire sprinkler systems as “basic components” under Part 21. This is consistent with AES’ definition of basic component as accepted by the NRC.

*Basic component:* A basic component means a structure, system, or component or part thereof that affects their IROFS function that is directly procured by the licensee or activity subject to the regulations in Part 70; and in which a defect or failure to comply with any applicable regulation in this chapter, order, or license issued by the Commission would create a substantial safety hazard (i.e., exceed performance requirements of 10 CFR 70.61). In all cases, basic components include IROFS-related design, analysis, inspection, testing, fabrication, replacement parts, or consulting services that are associated with the component hardware; whether these services are performed by the component supplier or others.

As described above, IROFS100 is not needed to meet the performance criteria of 10 CFR 70.61 and is only credited to meet the purpose statement in 10 CFR 70.64(b); therefore IROFS100 is not a basic component.

This categorization for fire sprinklers is consistent with NRC guidance applicable to Part 50 facilities. Regulatory Guide 1.189, Rev. 2, October 2009, Section 1.7 states: *Fire protection systems are not “safety-related” and, therefore, are not within the scope of Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,” to 10 CFR Part 50 (Ref. 1), unless the licensee has committed to include these systems under the plant’s Appendix B program.”*

While EREF is not a Part 50 facility, AES’s modification to its QAPD to develop a Fire Protection Quality Assurance Level (QA Level FP) was based on developing an approach to quality assurance implementation specific for these fire protection sprinkler systems consistent with good industry practice and which is practicable considering the expansive nature of the IROFS boundary. This IROFS boundary includes the sprinklers and piping, but also, the fire protection water supply including storage tanks, fire pumps, underground fire main loop, and fire alarm and detection panels and components that actuate pre-action sprinkler valves. This QA Level FP is intended to be discrete from QA Level 1 and QA Level 2 IROFS. QA Level 1 and 2 IROFS are relied upon to meet 10 CFR 70.61 performance requirements, QA Level FP sprinkler systems are not. The modifications that AES proposed to the QAPD to develop and implement QA Level FP reflect this difference and are consistent with augmented quality assurance controls typical to fire protection systems in commercial nuclear power plants (i.e., good industry practices).

To ensure overall system reliability, AES will establish operability limits for QA Level FP IROFS with associated time-based compensatory measures (i.e., fire watches, alternate water supply, etc.) consistent with NFPA requirements and good industry practices. Details of these measures will be submitted for NRC concurrence.

**Item 2** – QAPD Section 4 does apply to QA Level FP IROFS. However, since IROFS100 is not a basic component as discussed above, QAPD Sections 4.2 and 4.3 do not apply to QA Level FP IROFS.

**NRC RAI QAPD 7:**

Section A.2.6 of Appendix A to the QAPD states the following:

*“Section 7.0 of the QAPD is not applicable. The following shall apply:*

- *Purchase documents shall include requirements for appropriate certifications to applicable NFPA code/standard requirements (i.e., listed and/or approved).*
- *Purchase documents shall be reviewed and approved by QA and personnel with sufficient experience and knowledge in the NFPA code/standard requirements.*
- *Receipt inspection will be performed to confirm certification of procured items as meeting applicable NFPA code/standard requirements (i.e., listed and/or approved).”*

Please describe the controls for “Control of Purchased Items and Services” that are required by NFPA Codes and Standards. Please describe and justify any reduced level of QA procurement documentation control that will be provided for FP IROFS than that provided for QL-1 and QL-2 IROFS.

**AES Response to NRC RAI:**

AES will establish the following controls for “Control of Purchased Items and Services” for QA Level FP IROFS:

- Qualified personnel will perform and approve of the adequacy of fire protection requirements and quality requirements stated in procurement documents. This review will determine that fire protection requirements and quality requirements are correctly stated, inspectable, and controllable; and that there are adequate acceptance and rejection criteria. The fire protection approval shall be by an individual who satisfies qualifications for Society of Fire Protection Engineer (SFPE) professional member status.
- Receipt inspection shall be conducted by qualified personnel using checklists prepared from the procurement documents governing QA Level FP Items and the associated NFPA codes and standards, as applicable.
- Components required to be UL listed and/or FM Approved will be confirmed at receipt against current UL Fire Protection Equipment Directory or FM Approval Guides, as appropriate.
- Components not required to be UL listed and/or FM Approved (e.g., piping) will be confirmed at receipt against the applicable design and/or manufacturing standard (i.e., applicable ASTM, ISO, or other standard).

This level of procurement documentation is consistent with augmented quality practices for commercial nuclear plant fire protection features. An inoperability of the IROFS fire sprinkler systems is not a failure of a “safety-related” component, does not “create a substantial safety hazard”, and does not result in unacceptable risk of exceeding the performance requirements of

10 CFR 70.61 since other in-place IROFS are available to meet the performance requirements of 10 CFR 70.61.

**NRC RAI QAPD 8:**

Section A.2.8 of Appendix A to the QAPD states, "Section 9.0 of the QAPD is not applicable. Control of Special Processes will be in accordance with applicable NFPA codes/standards and commercial practices." Please describe the measures that will implement the Control of Special Processes as required by the NFPA codes/standards and justify any reduced level of QA control that will be provided for FP IROFS than that provided for QL-1 and QL-2 IROFS.

**AES Response to NRC RAI:**

AES does not anticipate that the need for "Control of Special Processes" associated with QA Level FP IROFS. See the AES response to NRC RAI QAPD 9 regarding testing and commissioning of QA Level FP IROFS. If any "Special Processes" become necessary, AES would develop qualified procedures consistent with NFPA code requirements, approved by qualified QA and FP representatives prior to performance.

This level of special process control is consistent with augmented quality practices for commercial nuclear plant fire protection features. An inoperability of the IROFS fire sprinkler systems is not a failure of a "safety-related" component, does not "create a substantial safety hazard", and does not result in unacceptable risk of exceeding the performance requirements of 10 CFR 70.61 since other in-place IROFS are available to meet the performance requirements of 10 CFR 70.61.

**NRC RAI QAPD 9:**

Section A.2.9 of Appendix A to the QAPD states, "Section 10 of the QAPD is not applicable. Inspection will be in accordance with applicable NFPA codes/standards and commercial practices." Please describe the controls that will implement the inspection as required by the NFPA codes/standards and justify any reduced level of QA inspection control that will be provided for FP IROFS than that provided for QL-1 and QL-2 IROFS.

**AES Response to NRC RAI:**

AES proposes to revise Section A.2.9 of Appendix A as shown in Enclosure 2. Factory acceptance, installation, and field acceptance testing and/or commissioning of QA Level FP IROFS will be conducted using written, approved procedures and incorporating the requirements of the applicable NFPA Code or Standard (i.e., NFPA 13, 20, 22, 24, and 72) for the component(s) under test or being commissioned.

On-going surveillance, inspection, test and maintenance of QA Level FP IROFS will be conducted using written, approved procedures following the requirements of the NFPA Code or Standard (i.e., NFPA 25 and 72) for the respective component(s) and at the NFPA specified frequencies.

This level of inspection testing and commissioning is consistent with augmented quality practices for commercial nuclear plant fire protection features. An inoperability of the IROFS fire sprinkler systems is not a failure of a "safety-related" component, does not "create a substantial safety hazard", and does not result in unacceptable risk of exceeding the performance requirements of 10 CFR 70.61 since other in-place IROFS are available to meet the performance requirements of 10 CFR 70.61.

**NRC RAI QAPD 10:**

Section A.2.10 of Appendix A to the QAPD states, "Section 11 of the QAPD is applicable except for Paragraph 11.5, "Computer Program Testing." Please clarify the following:

1. Paragraph 11.5 of the QAPD states, "Computer Program Testing is carried out in accordance with ASME NQA-1-1994, Basic Requirement 11, Test Control, and Supplement 11S-2, Supplementary Requirements for Computer Program Testing." Please clarify the intent of AES with regard to the use of NQA-1-1994 for computer program testing. Is the reference in the QAPD a commitment to comply with the provisions of ASME NQA-1-1994, Basic Requirement 11 and Supplement 11S-2, Supplementary Requirements for Computer Program Testing for Quality Level 1 and 2 IROFS? If this is a commitment, please ensure that it is referenced as such in applicable portions of the license application and the QAPD and that sufficient guidance and criteria is included in the QAPD to provide reasonable assurance that the provisions of 11S-2 of NQA-1-1994 will be met.
2. Please clarify if any fire components IROFS will be initiated by computer programs that will need to be tested.

**AES Response to NRC RAI:**

**Item 1** – It is AES's intent to utilize ASME NQA-1-1994, Basic Requirement 11, Test Control, and Supplement 11S-2, Supplementary Requirements for Computer Program Testing" for QA Levels 1 and 2 items as guidance (not as a commitment) in the development of our procedures to control activities associated with design output that consist of computer programs. AES will clarify the QAPD to clearly state that design outputs that consist of computer programs are developed, validated, and managed following the guidance on this point.

Also, see response to NRC question RAI QAPD 5 with regard to AES's intent to utilize the ASME NQA-1 sections as referred to in our QAPD as guidance in the development of our procedures to control activities associated with the design, procurement, fabrication, testing and installation of QA Level 1 and QA Level 2 IROFS only.

**Item 2** - Software-based logic will be employed for QA Level FP IROFS100. Specifically:

- pre-action sprinkler valves will require actuation signals from local Fire Alarm Control Panels (FACP) to open;

- fire pumps will require logic signals from local controllers to run on detection of pressure drop in the fire main loop;
- fire water supply tanks will have level and temperature conditions monitored to ensure they remain within operability limits;
- supervisory air or gas alarms will monitor pipe integrity to ensure piping systems are intact; and
- isolation valves at pre-action fire sprinkler risers will have valve position monitoring via FACP; other system valves may also have position monitoring.

Fire alarm system based logics are confirmed through testing as required by NFPA 72, National Fire Alarm Code requirements (i.e.; Input / Output device functional tests).

**NRC RAI QAPD 11:**

Section A.2.11 of Appendix A to the QAPD states, "Section 12 of the QAPD is not applicable. Control of Measuring and Test Equipment will be in accordance with applicable NFPA codes/standards and commercial practices." Please describe the measures that will implement for Control of Measuring and Test Equipment as required by the NFPA codes/standards and justify any reduced level of QA control of measuring and test equipment that will be provided for FP IROFS than that provided for QL-1 and QL-2 IROFS.

**AES Response to NRC RAI:**

This was an oversight in our submittal of QAPD Revision 4. Measuring and test equipment utilized for QA Level FP IROFS will be calibrated and controlled in accordance with the EREF M&TE program. Please see proposed revision to Appendix A in Enclosure 2.

**NRC RAI QAPD 12:**

Section A.2.13 of Appendix A to the QAPD states, "Section 14 of the QAPD is applicable. Inspection, Test and Operating Status will be in accordance with applicable NFPA codes/standards and commercial practices." Please clarify if Section 14.0 of the QAPD is applicable or not, and if the NFPA codes/standards will be additional requirements in this section. Please describe the controls that will implement NFPA code requirements.

**AES Response to NRC RAI:**

QAPD Section 14 is applicable as originally stated in Appendix A. To ensure clarity, AES proposes to remove "Inspection, Test and Operating Status will be in accordance with applicable NFPA codes/standards and commercial practices." Please see the proposed revision to Appendix A in Enclosure 2.

**NRC RAI QAPD 13:**

Section A.2.15 of Appendix A to the QAPD states, "All requirements of Section 16 "Corrective Action" shall apply except reportability requirements for 10 CFR Part 21." Please clarify the intent of the statement above. There have not been any Part 21 exemption requests for reporting requirements issued for these components. Part 21 reporting requirements apply to

all safety-related components that could create a substantial safety hazard and whose failure would exceed the performance requirements in 10 CFR 70.61.

**AES Response to NRC RAI:**

Please refer to the response to NRC RAI QAPD 6. An inoperability of the IROFS fire sprinkler systems is not a failure of a "safety-related" component, does not "create a substantial safety hazard", and does not result in unacceptable risk of exceeding the performance requirements of 10 CFR 70.61 since other in-place IROFS are available to meet the performance requirements of 10 CFR 70.61.

**NRC RAI QAPD 14:**

Section A.2.17 of Appendix A to the QAPD states, "Section 18 of the QAPD is applicable except Section 18.2 "External Audits" is not required but may be implemented at the discretion of AES." Please describe the controls that will be implemented to verify the acceptability of suppliers of fire components and justify any reduced level of QA controls that will be provided for FP IROFS than that provided for QL-1 and QL-2 IROFS.

**AES Response to NRC RAI:**

AES will selectively monitor vendors and may perform on-site inspection and testing oversight (e.g., Factory Acceptance testing for fire alarm control panels). AES does not intend to have a mandatory requirement for supplier audits for QA Level FP items. As is consistent with practices for commercial nuclear plant fire protection, reliance for the quality of fire protection features rests in the UL and/or FM Mark. Such approvals represent an acceptable standard of care as-is applied to the Fire Protection component industry. Both UL and FM classify manufacturers and their products based on multiple criteria including 1) conformance to specific component and sub-component listing standards, 2) documentation that the test criteria of those component standards are satisfied, and 3) that representative samples of these products have been submitted to the listing agency and found to comply with the applicable requirements.

**Associated EREF License Application Revisions:**

The EREF License Application will be revised as follows to incorporate the RAI responses:

The QAPD will be revised to reflect the responses provided to these RAIs. The markups to the QAPD related to Appendix A are provided in Enclosure 2.

**Commitments:**

The EREF QAPD markup pages will be included in Revision 5 of the QAPD that will accompany Revision 3 of the EREF License Application.

**Attachments:**

Enclosure 2 shows the markup to the EREF QAPD related to Appendix A.

## QAPD Markup

### 2.0 QUALITY ASSURANCE PROGRAM

2.1 QA elements of this section are applied to IROFS and SSCs that could interact with IROFS due to a seismic event, to assure they will be available and reliable in performing their safety functions when needed. Subcomponents of QA items may be classified, through engineering procedures, at different QA Levels based on their critical attributes. This classification QA Levels are established as follows:

<u>Level</u>	<u>Description</u>
QA Level 1	QA Level 1 items include those items whose failure or malfunction could directly result in a condition that adversely affects public, worker and the environment as described in 10 CFR 70.61. The failure of a single QA Level 1 item could result in a high or intermediate consequence. For IROFS that contain a Safe-by-Design attribute, only the attribute (diameter, volume, slab thickness or physical arrangement) is considered to be QA Level 1.
QA Level 2	QA Level 2 items include those items whose failure or malfunction could indirectly result in a condition that adversely affects public, worker and the environment as described in 10 CFR 70.61. The failure of a QA Level 2 item, in conjunction with the failure of an additional item, could result in a high or intermediate consequence. All building and structure IROFS associated with credible external events are QA Level 2. QA Level 2 items also include those attributes of items that could interact with IROFS due to a seismic event, and result in high or intermediate consequences as described in 10 CFR 70.61.
QA Level 3	QA Level 3 items include those items that are not classified as QA Level 1 or QA Level 2. QA Level 3 items are controlled in accordance with standard commercial practices.
QA Level FP	QA Level FP items apply only to automatic fire suppression systems located in buildings and/or over areas containing licensed material-at-risk, which if released could exceed 10 CFR 70.61 performance requirements, and are designated as IROFS to satisfy 10 CFR 70.64(b) requirements.

## **APPENDIX A (Complete Revision)**

### **Quality Assurance Requirements for Fire Protection Items Relied On For Safety**

- A.1** Quality Assurance program requirements provide assurance that QA Level FP IROFS are designed, fabricated, erected, tested, maintained, and operated so that they will function as intended.

Those fire protection structures, systems, and components (SSCs) designated as QA Level FP IROFS will be:

1. Designed, specified, procured, installed, and tested in accordance with requirements of the applicable NFPA code and/or standard(s) (see exceptions to IROFS commitments below)
2. Listed and/or approved by an independent agency such as Underwriters Laboratories, Factory Mutual, or other acceptable agency except in cases where such listing/approval is not required by NFPA code/standard (e.g., sprinkler piping is not required to be listed)
3. Inspected on receipt consistent with QAPD requirements to verify compliance to the criteria specified above.

- A.2** The following elements of the EREF QAPD (with noted exceptions) will be implemented to satisfy Quality Assurance requirements for the designated QA Level FP IROFS:

#### **A.2.0 Section 1.0 Introduction and Organization**

Section 1.0 of the QAPD is applicable.

#### **A.2.1 Section 2.0 Quality Assurance Program**

Section 2.0 of the QAPD is applicable with the following clarification:

Automatic fire suppression systems located in buildings and/or over areas containing licensed material-at-risk, which if released could exceed 10 CFR 70.61 performance requirements, and are designated as IROFS to satisfy 10 CFR 70.64(b) requirements. These IROFS will be designated as QA Level Fire Protection (QA Level FP).

#### **A.2.2 Section 3.0 Design Control**

Section 3.0 of the QAPD is applicable with the following exceptions:

Standard commercial design software may be used for performance of QA Level FP design activities. The guidance for design software to be compliant with ASME NQA-1, 1994 edition, Basic Requirement 11 and NQA-1, Part II, Subpart 2.7, "QA Requirements for Computer Software for Nuclear Plant Applications" is not applicable.

The guidance for design verification in accordance with ASME NQA-1, 1994 edition, Supplement 3S-1 for methods of design verification including any one or a combination

of the following, as defined in design reviews, alternate calculations, or the performance of qualification tests, is not applicable.

### **A.2.3 Section 4.0 Procurement Document Control**

Section 4.0 is applicable with the exception of Paragraphs 4.2 and 4.3 (e.g., Commercial Grade dedication and Part 21 do not apply).

In addition AES will require:

- Purchase documents shall include requirements for appropriate certifications to applicable NFPA code/standard requirements (i.e., listed and/or approved).
- Purchase documents shall be reviewed and approved by QA and personnel with sufficient experience and knowledge in the NFPA code/standard requirements. The fire protection approval shall be by an individual who satisfies qualifications for Society of Fire Protection Engineer (SFPE) professional member status.

### **A.2.4 Section 5.0 Instruction, Procedures and Drawings**

Section 5.0 of the QAPD is applicable.

### **A.2.5 Section 6.0 Document Control**

Section 6.0 of the QAPD is applicable.

### **A.2.6 Section 7.0 Control of Purchased Items**

Section 7.0 of the QAPD is not applicable. The following shall apply:

- The procurement of QA Level FP items is controlled through procedures to assure conformance with specified requirements. These controls provide for the following, as appropriate: evaluation of objective evidence of quality furnished by the supplier, and examination of items or services upon delivery or completion.
- Qualified personnel will perform and approve of the adequacy of fire protection requirements and quality requirements stated in procurement documents. This review will determine that fire protection requirements and quality requirements are correctly stated, inspectable, and controllable; and that there are adequate acceptance and rejection criteria. The fire protection approval shall be by an individual who satisfies qualifications for Society of Fire Protection Engineer (SFPE) professional member status.
- Acceptance of purchased items shall be verified by receipt inspection and/or post installation testing. Receipt inspection will be performed to confirm;
  - Items are in compliance with procurement document requirements,
  - No substitutions have been provided without engineering approval,
  - items were not damaged in shipment and

- Certification of procured items as meeting applicable NFPA code/standard requirements (i.e., listed and/or approved).
- Receipt inspection shall be conducted by qualified personnel using checklists prepared from the procurement documents governing QA Level FP Items and the associated NFPA codes and standards, as applicable.
- Components required to be UL listed and/or FM Approved will be confirmed at receipt against current UL Fire Protection Equipment Directory or FM Approval Guides, as appropriate.
- Components not required to be UL listed and/or FM Approved (e.g., piping) will be confirmed at receipt against the applicable design and/or manufacturing standard (i.e., applicable ASTM, ISO, or other standard).
- Post installation testing shall be performed, when needed, to verify specified performance requirements as defined in procurements documents have been satisfied. If post installation testing is required for final acceptance, receipt inspection will apply appropriate status indicators on the item as required by Section A.2.13 of this appendix to ensure the item is clearly identified as requiring "Post Installation Testing".

#### **A.2.7 Section 8.0 Identification and Control of Items**

Section 8.0 of the QAPD is applicable.

#### **A.2.8 Section 9.0 Control of Special Processes**

Section 9.0 of the QAPD is not applicable. Control of Special Processes will be in accordance with applicable NFPA codes/standards and commercial grade practices.

#### **A.2.9 Section 10.0 Inspection**

Section 10.0 of the QAPD is applicable.

Factory acceptance, installation, and field acceptance testing and/or commissioning of QA Level FP IROFS will be conducted using written, approved procedures and incorporating the requirements of the applicable NFPA Code or Standard (i.e., NFPA 13, 20, 22, 24, and 72) for the component(s) under test or being commissioned.

On-going surveillance, inspection, test and maintenance of QA Level FP IROFS will be conducted using written, approved procedures following the requirements of the NFPA Code or Standard (i.e., NFPA 25 and 72) for the respective component(s) and at the NFPA specified frequencies.

**A.2.10 Section 11.0 Test Control**

Section 11.0 of the QAPD is applicable except for Paragraph 11.5 "Computer Program Testing".

**A.2.11 Section 12.0 Control of Measuring and Test Equipment**

Section 12.0 of the QAPD is applicable.

**A.2.12 Section 13.0 Handling, Storage and Shipping**

Section 13.0 of the QAPD is applicable.

**A.2.13 Section 14.0 Inspection, Test and Operating Status**

Section 14.0 of the QAPD is applicable.

**A.2.14 Section 15.0 Control of Nonconforming Items**

Section 15.0 of the QAPD is applicable.

**A.2.15 Section 16.0 Corrective Actions**

All requirements of Section 16.0 "Corrective Action" shall apply except reportability requirements for 10CFR Part 21.

**A.2.16 Section 17.0 Quality Assurance Records**

Section 17.0 of the QAPD is applicable.

**A.2.17 Section 18.0 Audits**

Section 18.0 of the QAPD is applicable except Section 18.2 "External Audits" is not required but may be implemented at the discretion of AES.

**A.2.18 Section 19.0 Provision for Changes**

Section 19.0 of the QAPD is applicable.