EHS&L Document

SNM-1227 - Chapter 9 Environmental Protection

Nature of Changes

| Item | Paragraph | Description | Justification | | | | |
|--|-----------------|---|---------------------|--|--|--|--|
| 1. | Entire Document | Changed AREVA Inc. to Framatome Inc. | Company Name Change | | | | |
| 2. | | | | | | | |
| 3. | | | | | | | |
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| 9. | | | | | | | |
| 10. | | | | | | | |
| List Below any Documents, including Forms & Operator Aids which must be issued concurrently with this document revision: | | | | | | | |
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This Document contains a total of 10 pages excluding the signature page.

DOCUMENT REVIEW/APPROVAL/DELETION CHECKLIST

All new and/or revised procedures shall be approved by the change author, cognizant manager(s) of areas affected by the changes, and by applicable manager(s) of any function that approved the previous revision of the document unless responsibility for such approval has been transferred to another organization. Also, the procedure shall be approved by manager(s) of functional organizations that provide technical reviews with the exception of the Training Department. Finally, Document Control shall verify that the required approvals have been properly obtained and that any documents that must be issued concurrently are ready to be issued.

| Document | Document Approvals | | | |
|------------------------------------|---|------------------------------|--|------------------------------|
| Purpose/Function of Review | Specify Reviewer(s) (Optional except for change author) | (Check all that apply) | Title of Approver | (Check all that Apply) |
| Document Control (Automatic) | | | Document Control (Automatic) | \square |
| Change Author | CD Manning | \square | Author | \square |
| Independent Technical Review | | | | |
| Operability Review(s) | | | Mgr, Richland Operations ⁽¹⁾ | |
| Conversion | | | Mgr, Uranium Conversion & | |
| Recovery | | | Recovery Operations ⁽¹⁾ | |
| Ceramics | | | Mgr, Ceramic Operations ⁽¹⁾ | |
| Rods | | | Mar Dodo & Dundloo ⁽¹⁾ | |
| Bundles | | | Mgr, Rous & Buridles | |
| Components | | | Mgr, Component Fabrication ⁽¹⁾ | |
| Maintenance Review | | | Mgr, Maintenance ⁽¹⁾ | |
| Lab Review | | | Mgr, Production Support ⁽¹⁾ | |
| Transportation | | | Mgr, Ops Strategy & Supply Chain | |
| EHS&L Review(s) | | | Mgr, EHS&L ⁽²⁾ | \square |
| Criticality | | | Mar Nuclear Safety ⁽²⁾ | |
| Radiation Protection | | | Mgr, Nuclear Salety | |
| Safety | | | Mgr, Safety ⁽²⁾ | |
| Security/Emergency Prep. | | | Mgr, Security & Emergency | |
| Fire Safety | | | Preparedness ⁽²⁾ | |
| MC&A | | | | |
| Transportation | | | Mgr, Licensing & Compliance ⁽²⁾ | |
| Environmental | CD Manning | \square | | |
| Mechanics Richland Review | | | Mar Mechanics Richland | |
| Mechanics Lynchburg Review | | | | |
| Thermal-Hydraulics Richland Review | | | Mgr, Thermal-Hydraulics Richland | |
| Thermal-Mechanics Richland Review | | | Mgr, Materials & Therm-Mechs | |
| Project & Reliability Review | | | Mgr, Project & Reliability Eng. | |
| Quality Review | | | Mgr, Richland Site Quality | |
| Purchasing Review | | | Mgr, PP&CPC | |
| Others: | | | Mgr, Richland Site/Other | |
| Document Control | | | Richland Records Management | |
| Training & Employee Dev.: (3) | | | Training & Employee Dev. | |

⁽¹⁾Note: If approvals include 2 or more product center managers, the Operations manager can be substituted for the applicable product center managers.

⁽²⁾Note: If approvals include 2 or more EHS&L functional managers, the EHS&L manager can be substituted for the applicable EHS&L functional managers.

⁽³⁾Note: Training department review is required for all procedures that require or affect a Learning Plan and if additional training materials or curriculum must be revised before issuing procedure.

23371 (Rev. 001, 01/09/2018)

| EHS&L CHANGE IMPACT EVALUATION FORM | | | | | | | | | | |
|--|---|---|--|--|-----------------------|---|---|--------|-------|--------|
| The scope and conter below. Future revisio previously excluded s | The scope and content of this document have been determined by EHS&L to not impact the safety disciplines checked below. Future revisions do not require review by those EHS&L component(s) unless the scope changes such that a previously excluded safety discipline may be impacted. | | | | | | | | | |
| Criticality Radiati | ion Protection | ety/Security | Emergency I | Preparedness | | MC&A | Transportatior | n 🗌 Er | viron | mental |
| DOCUMENT VERSION: | EHS&L REVIEW C | OMPONENT: | EVALUATION | DATE: | Сн | ANGE EVALU | ATOR*: | | | |
| | 2 [№] PARTY APPROVAL*: | | | | | | | | | |
| | _ | | | | _ | | | _ | _ | |
| The scope and content handling of licensed r 10CFR 70.72 change handling of licensed r | nt of this document naterials (enriched evaluation unless t naterials. | have been (uranium). F he scope of | determined b Future revision the documen | y EHS&L to ns to this do t changes s | o not ocum such | directly imp nent do not r that it direct | act the safe equire the tly impacts the | he | | |
| DOCUMENT / ECN NO** | : | EVALUATIO | ON DATE: | | | CHANGE | EVALUATOR: | | | |
| E10-08 | -009 | | 1/19/18 | 8 | | | CD Ma | anning | | |
| Does the change pote | entially impact Criti | cality Alarm | System (CAS | s) coverage | ? | | | | ES | 🛛 No |
| | | EVALUATIO | ON OF NRC | PRE-APPR | ROV | AL: | | | | |
| IS NRC PRE-APPROVA > Ba > Ba | IS NRC PRE-APPROVAL (LICENSE AMENDMENT) NEEDED? > Based on "YES" answer to any of five questions below. > Based on "NO" answer to all five questions below. | | | | | | 🛛 No | | | |
| 1. Does the change would exceed the consequence ev Summary? | 1. Does the change create new types of accident sequences that, unless mitigated or prevented, would exceed the performance requirements of 10 CFR 70.61 (create high or intermediate consequence events) and that have not previously been described in Framatome's ISA □ YES □ No | | | | | | 🛛 No | | | |
| 2. Does the change no prior experier | Does the change use new processes, technologies, or control systems for which Framatome has no prior experience? | | | | | | 🛛 No | | | |
| Does the change remove, without at least an equivalent replacement of the safety function an item relied on for safety (IROFS) that is listed in the ISA Summary? | | | | | | | 🛛 No | | | |
| 4. Does the change alter any item relied on for safety, listed in the ISA Summary, that is the sole item preventing or mitigating an accident sequence of high or intermediate consequences? | | | | | 🛛 No | | | | | |
| 5. Does the change condition? | 5. Does the change qualify as a change specifically prohibited by NRC regulation, order or license condition? | | | | | 🛛 No | | | | |
| Evaluation of Actions Required PRIOR TO OR CONCURRENT with Change Implementation: | | | | | | | | | | |
| 6. Modification / Addition to CAS system or system coverage documentation | | | | | | | | | | |
| 7. Acquire NRC pre-approval (LICENSE AMENDMENT) Yes No 8. Conduct/modify ISA Yes No | | | | | | X NO X No | | | | |
| 9. Modify / update the following: | Modify / update the following: □ None □ ISA Database □ NCSA □ NCSP □ RHA □ ChHA | | | | | | A edures | | | |
| Evaluation of Actions Required <u>SUBSEQUENT TO</u> Change Implementation: | | | | | | | | | | |
| 10. Modify / update the following: ISA Database ISA Database RHA ChHA 10. Modify / update the following: Other ISA Database NCSA PHA RHA Pha 10. MCSP ISA Database ISA Data | | | | | | | | | | |
| | | | | | | | | | | |

(*) Only required if one or more of the boxes to exclude a particular safety discipline review is checked.

(**) If this form exists as a part of a document, the document number is not required.

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9.0 Environmental Protection

9.1 Environmental ALARA

The Richland site's as low as reasonably achievable (ALARA) program is described in Chapter 4.0, "Radiation Protection." With respect to environmental protection, Framatome Inc.'s (Framatome's) goal is to maintain concentrations of radioactive materials in plant effluents and the surrounding environs at ALARA levels. Furthermore, environmental releases shall be limited and monitored such that compliance with the public dose limits of 10 CFR 20.1301 and the effluent limits of 10 CFR 20.1302 can be achieved and demonstrated.

9.2 Gaseous Effluent Control

Operating and engineered controls will be used as necessary to ensure that environmental airborne concentrations of radioactive materials attributable to gaseous effluents and resultant radiological doses to members of the public comply with the concentration limits and public dose limits specified in 10 CFR 20. The site will maintain procedures with action levels to assure that compliance with applicable limits is maintained. This includes the ALARA constraint on air emissions of 10 CFR 20.1101(d).

Dose calculations as well as environmental concentrations in 10 CFR 20, Appendix B, Table 2 for members of the public may be modified based on ICRP 66 and 68, assuming an Activity Median Aerodynamic Diameter (AMAD) of 1 micrometer.

9.2.1 Gaseous Effluent Sampling

Continuous representative sampling shall be provided on stacks exhausting air with potential concentrations of radioactive materials that are significant with respect to the site's compliance with 10 CFR 20. These samples shall be periodically analyzed for particulate radioactive material, generally on a weekly basis. Stack samples of gaseous effluents potentially containing uranium shall be analyzed for gross alpha activity. Non-uranium isotopes likely to contribute less than 0.1 mrem total effective dose equivalent (TEDE) per year to a member of the public will not necessarily be accounted for.

Sampling of exhaust air stacks may be suspended when the underlying ventilation system has been shut down in conjunction with a cessation of the processing of radioactive materials in the affected ventilated spaces (see Sec. 4.6.1, Ventilation). Any passive emissions of radioactive materials from the stack shall be abated via the continued presence of the HEPA filters required to be in place when the emission unit is operating. Special provisions for restart, if deemed necessary, shall be formally documented/implemented.

9.2.2 High-Efficiency Particulate Absolute (HEPA) Filtration

Air exhausted from areas, equipment, and/or activities that may contain concentrations of radioactive materials that are significant with respect to the site's compliance with 10 CFR 20 shall be passed through at least one stage of HEPA filtration prior to release via an exhaust stack. Fire-resistant HEPA filters that are certified by the manufacturer as meeting HEPA efficiency specifications shall be used.

The adequacy of final HEPA filter installations shall be verified by in-place testing prior to initiating operations with radioactive materials in the following instances:

- Startup of a new facility.
- Following replacement of final filters
- After maintenance work on the final filter bank that could have foreseeable adverse impacts on their effective operation.
- After exposure of the final filters to a condition or agent that may have adversely impacted their effective operation, if deemed necessary based on a visual/operational inspection.

9.2.3 Final HEPA Filter Surveillance

Measures will be taken to conservatively monitor the potential onset of, or adverse emissions impacts from, HEPA filter deterioration caused by corrosive chemical fumes. These measures will include the following:

- implementation of a preventive maintenance (PM) procedure for the periodic inspection of HEPA filters (primary and final banks) in systems exhausting air from areas or process equipment containing corrosive fumes. The PM procedure will designate the applicable systems, specify required frequencies of inspections, and identify required actions in the event of unacceptable results.
- maintenance of a site procedure for the periodic measurement of differential pressures across HEPA filter banks; and
- maintenance of a stack emissions monitoring procedure that includes action levels triggering notifications to the maintenance/engineering organization and performance of HEPA filter inspections at measured offgas radionuclide concentrations well below applicable modified 10 CFR 20 Appendix B effluent limits. Inspections trigger repair or replacement as needed.

Final HEPA filter installations shall be equipped with pressure differential measuring/indicating devices. Measured differential pressures shall be used to evaluate the need for filter changeout/maintenance. See Chapter 4, Section 4.6.1 for evaluation criteria.

9.3 Liquid Effluent Controls

Operating and engineered controls will be used as necessary to ensure that concentrations of radioactive materials in liquid effluents and sewer discharges are compliant with 10 CFR 20.1302 and 10 CFR 20.2003, respectively. The site will maintain procedures with action levels to ensure that compliance with applicable limits is maintained.

9.3.1 Wastewater Collection/Treatment

Wastewaters contaminated with, or subject to contamination with, radioactive materials shall be managed, as appropriate, within the plant's process wastewater management system. After any necessary treatment, process wastewaters may be combined with plant sanitary sewage and non-contaminated cooling water streams for discharge to the City of Richland sewer system. The process wastewater management system shall provide treatment required to assure compliance with 10 CFR 20 radiological sewering limits.

9.3.2 Wastewater Sampling

The plant's combined liquid effluent shall be proportionately sampled for uranium and measured for flow at the Framatome plant effluent monitoring station prior to discharge to the city sewer. Utilization of an appropriate grab sampling program is permissible on a short-term interim basis

to cover instances when the proportional sampler is inoperable. Discharge data based on grab samples shall be so noted in the plant liquid effluent sampling records.

9.4 Environmental Monitoring

Framatome shall conduct a routine environmental surveillance program relative to operation of the Richland fuel fabrication facility. Surface environmental media and groundwater samples shall be collected from strategic locations in the surrounding environs and analyzed for pertinent constituents of concern.

9.4.1 Surface Environmental Sampling

Surface-level environmental media shall be sampled for uranium and fluorides per the following schedule. See Figure 9-1 for the location of the stations.

| Sample Station | Media | Frequency | Analysis |
|-------------------|--------|-----------|----------|
| 1 | Soil | Quarterly | Uranium |
| 2 | Soil | Quarterly | Uranium |
| 3 | Air | Monthly | Fluoride |
| 4 | Air | Monthly | Fluoride |
| 5 | Forage | Monthly* | Fluoride |
| 6 | Forage | Monthly* | Fluoride |
| | | | |

* During the growing season only (April-September)

9.4.2 Groundwater Sampling

Samples of groundwater shall be collected as outlined below. The program design (sampled constituents and well locations) focuses on current facilities managing the plant's major process wastewater streams as well as the legacy surface impoundment (lagoon) system. See Figure 9-2 for locations of the groundwater monitoring wells.

| Well Numbers | Frequency | Analysis |
|--------------------------|-----------|-----------------------------|
| GM-1, GM-2, GM-5, GM-6, | Semi- | Gross alpha/beta, fluoride, |
| GM-7, GM-8, GM-10, GM-12 | Annually | nitrate, pH |

9.4.3 Sanitary Sewer Sludge Sampling

The release of radioactive materials to the municipal sewer system shall be controlled and sampled as described in Section 9.3. In addition to the effluent monitoring described therein, Framatome shall conduct a routine sampling program for the radioactive content of sewage sludge produced at the City of Richland sewage treatment plant. Samples of the sludge in its dewatered (semi-dry) state, as subsequently landfilled, shall be collected quarterly and analyzed

for uranium and moisture content. The uranium-based activity in picocuries per gram of sewage sludge (as landfilled) shall be maintained below 30 pCi/gram for any confirmed single sample result and below 25 pCi/gram of sewage sludge as an annual running average. Results in excess of these values shall be cause for investigation, with a follow-up action plan as appropriate to restore compliance with limits.

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Figure 9-2 Groundwater Monitoring Wells