

**EHS&L Document**

**SNM-1227 - Chapter 3  
Integrated Safety Analysis (ISA) and ISA Summary**

**Nature of Changes**

Item	Paragraph	Description	Justification
1.	Entire Document	Changed AREVA Inc. to Framatome Inc.	Company Name Change
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
List Below any Documents, including Forms & Operator Aids which must be issued concurrently with this document revision:			

This Document contains a total of 6 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 Reviews			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)		<input checked="" type="checkbox"/>	Document Control (Automatic)	<input checked="" type="checkbox"/>
Change Author	CD Manning	<input checked="" type="checkbox"/>	Author	<input checked="" type="checkbox"/>
Independent Technical Review		<input type="checkbox"/>		
Operability Review(s)			Mgr, Richland Operations <sup>(1)</sup>	<input type="checkbox"/>
Conversion		<input type="checkbox"/>	Mgr, Uranium Conversion & Recovery Operations <sup>(1)</sup>	<input type="checkbox"/>
Recovery		<input type="checkbox"/>	Mgr, Ceramic Operations <sup>(1)</sup>	<input type="checkbox"/>
Ceramics		<input type="checkbox"/>	Mgr, Rods & Bundles <sup>(1)</sup>	<input type="checkbox"/>
Rods		<input type="checkbox"/>	Mgr, Component Fabrication <sup>(1)</sup>	<input type="checkbox"/>
Bundles		<input type="checkbox"/>	Mgr, Maintenance <sup>(1)</sup>	<input type="checkbox"/>
Components		<input type="checkbox"/>	Mgr, Production Support <sup>(1)</sup>	<input type="checkbox"/>
Maintenance Review		<input type="checkbox"/>	Mgr, Ops Strategy & Supply Chain	<input type="checkbox"/>
Lab Review		<input type="checkbox"/>	Mgr, EHS&L <sup>(2)</sup>	<input checked="" type="checkbox"/>
Transportation		<input type="checkbox"/>	Mgr, Nuclear Safety <sup>(2)</sup>	<input type="checkbox"/>
EHS&L Review(s)			Mgr, Safety <sup>(2)</sup>	<input type="checkbox"/>
Criticality	WL Doane	<input checked="" type="checkbox"/>	Mgr, Security & Emergency Preparedness <sup>(2)</sup>	<input type="checkbox"/>
Radiation Protection		<input type="checkbox"/>	Mgr, Licensing & Compliance <sup>(2)</sup>	<input type="checkbox"/>
Safety		<input type="checkbox"/>	Mgr, Mechanics Richland	<input type="checkbox"/>
Security/Emergency Prep.		<input type="checkbox"/>	Mgr, Thermal-Hydraulics Richland	<input type="checkbox"/>
Fire Safety		<input type="checkbox"/>	Mgr, Materials & Therm-Mechs	<input type="checkbox"/>
MC&A		<input type="checkbox"/>	Mgr, Project & Reliability Eng.	<input type="checkbox"/>
Transportation		<input type="checkbox"/>	Mgr, Richland Site Quality	<input type="checkbox"/>
Environmental		<input type="checkbox"/>	Mgr, PP&CPC	<input type="checkbox"/>
Mechanics Richland Review		<input type="checkbox"/>	Mgr, Richland Site/Other	<input type="checkbox"/>
Mechanics Lynchburg Review		<input type="checkbox"/>	Richland Records Management	<input type="checkbox"/>
Thermal-Hydraulics Richland Review		<input type="checkbox"/>	Training & Employee Dev. <sup>(3)</sup>	<input type="checkbox"/>
Thermal-Mechanics Richland Review		<input type="checkbox"/>		
Project & Reliability Review		<input type="checkbox"/>		
Quality Review		<input type="checkbox"/>		
Purchasing Review		<input type="checkbox"/>		
Others:		<input type="checkbox"/>		
Document Control		<input type="checkbox"/>		
Training & Employee Dev.: <sup>(3)</sup>		<input type="checkbox"/>		

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

<sup>(2)</sup>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.

<sup>(3)</sup>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.

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EHS&L CHANGE IMPACT EVALUATION FORM			
<p>The scope and content of this document have been determined by EHS&amp;L to not impact the safety disciplines checked below. Future revisions do not require review by those EHS&amp;L component(s) unless the scope changes such that a previously excluded safety discipline may be impacted.</p> <p> <input type="checkbox"/> Criticality   <input type="checkbox"/> Radiation Protection   <input type="checkbox"/> Safety/Security   <input type="checkbox"/> Emergency Preparedness   <input type="checkbox"/> MC&amp;A   <input type="checkbox"/> Transportation   <input type="checkbox"/> Environmental </p>			
DOCUMENT VERSION:	EHS&L REVIEW COMPONENT:	EVALUATION DATE:	CHANGE EVALUATOR*:
			2 <sup>ND</sup> PARTY APPROVAL*:

<p>The scope and content of this document have been determined by EHS&amp;L to not directly impact the safe handling of licensed materials (enriched uranium). Future revisions to this document do not require the <b>10CFR 70.72</b> change evaluation unless the scope of the document changes such that it directly impacts the handling of licensed materials.</p>			<input type="checkbox"/>
DOCUMENT / ECN No**:	EVALUATION DATE:	CHANGE EVALUATOR:	
E10-08-003	1/19/18	CD Manning	
Does the change potentially impact Criticality Alarm System (CAS) coverage?			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<b>EVALUATION OF NRC PRE-APPROVAL:</b>			
<b>IS NRC PRE-APPROVAL ( LICENSE AMENDMENT ) NEEDED?</b> <ul style="list-style-type: none"> <li>➤ Based on "YES" answer to any of five questions below.</li> <li>➤ Based on "NO" answer to all five questions below.</li> </ul>			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
1. Does the change create new types of accident sequences that, unless mitigated or prevented, would exceed the performance requirements of <b>10 CFR 70.61</b> (create high or intermediate consequence events) and that have not previously been described in Framatome's ISA Summary?			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
2. Does the change use new processes, technologies, or control systems for which Framatome has no prior experience?			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
3. Does the change remove, without at least an equivalent replacement of the safety function an item relied on for safety ( <b>IROFS</b> ) that is listed in the ISA Summary?			<input type="checkbox"/> YES <input checked="" type="checkbox"/> 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?			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
5. Does the change qualify as a change specifically prohibited by NRC regulation, order or license condition?			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<b>Evaluation of Actions Required <u>PRIOR TO OR CONCURRENT</u> with Change Implementation:</b>			
6. Modification / Addition to CAS system or system coverage documentation			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
7. Acquire NRC pre-approval (LICENSE AMENDMENT)			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
8. Conduct/modify ISA			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
9. Modify / update the following:	<input checked="" type="checkbox"/> None <input type="checkbox"/> Other	<input type="checkbox"/> ISA Database <input type="checkbox"/> Red-Line Drawings/P&ID	<input type="checkbox"/> NCSA <input type="checkbox"/> NCSS
		<input type="checkbox"/> NCSP <input type="checkbox"/> PHA	<input type="checkbox"/> RHA <input type="checkbox"/> FHA
			<input type="checkbox"/> ChHA <input type="checkbox"/> Procedures
<b>Evaluation of Actions Required <u>SUBSEQUENT TO</u> Change Implementation:</b>			
10. Modify / update the following:	<input checked="" type="checkbox"/> None <input type="checkbox"/> Other	<input type="checkbox"/> ISA Database <input type="checkbox"/> AS-Built Drawings/P&ID	<input type="checkbox"/> NCSA <input type="checkbox"/> NCSS
		<input type="checkbox"/> NCSP <input type="checkbox"/> PHA	<input type="checkbox"/> RHA <input type="checkbox"/> FHA
			<input type="checkbox"/> ChHA <input type="checkbox"/> Procedures
<p>Justification Section for "YES" preceding Questions 1 – 8 or other for 9, 10: Being prepared as part of a License Amendment, however pre-approval of the amendment prior to issuing is not required.</p>			

(\*) 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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### 3.0 Integrated Safety Analysis (ISA) and ISA Summary

#### 3.1 *ISA Program*

Framatome Inc. (Framatome) maintains an ISA program for the areas of the Richland Horn Rapids Road (HRR) facility that involve, or could impact the safe handling of, SNM as described in the ISA Summary approved by the NRC by letter dated October 25, 2007 or as subsequently approved. The ISA program consists of the following elements: 1) an ISA Summary, 2) ISA program commitments described in this chapter, and 3) ISA supporting information maintained at the facility. The supporting information includes items such as the nuclear criticality safety analyses (NCSAs), radiological hazards analyses (RHAs), fire hazards analyses (FHAs), process hazards analyses (PHAs), and chemical consequence determinations.

##### 3.1.1 Process Safety Information

The uranium operations at the HRR facility consist of nuclear fuel fabrication, including chemical conversion, pellet fabrication, component assembly, and various uranium recovery operations. The complexity of some operations and the potential consequences of equipment failure are such that some operations require the use of piping and instrumentation diagrams (P&IDs), flow diagrams, and other aids to adequately assess these operations. The facility will maintain process safety information in sufficient detail to support the safety analysis, including process descriptions, P&IDs, equipment drawings, and hazardous material inventories.

##### 3.1.2 ISA Change Management

Changes to the facility that impact the ISA are accomplished using the configuration management system(s) described in Chapter 11. The Manager of the Environmental, Health, Safety and Licensing (EHS&L) function or his delegate determines whether an ISA team will convene and, if so, which disciplines are required to perform hazards evaluations for these changes.

##### 3.1.3 ISA Team (PHA)

PHAs will be performed by a team comprised of a team leader, individuals knowledgeable of the process, and individuals within appropriate safety functions, commensurate with the process being reviewed.

Prior to starting the hazards analysis, the team will be instructed in the methodology to be used. Team members may represent more than one functional area being evaluated. Functions that are not affected by the proposed change being evaluated do not require representation.

##### 3.1.4 Identification of Potential Accident Sequences

Credible accident sequences will be identified using any of the methodologies listed in NUREG 1513, "Integrated Safety Analysis Guidance Document" (e.g., What If, Check List, FMEA, HAZOP, fault trees).

##### 3.1.5 Identification of Consequences and Likelihood of Potential Accident Sequences

For each identified credible accident sequence, the consequences will be classified as "high," "intermediate," or "low." This determination is based on information included in existing safety analyses (PHAs, NCSAs, RHAs and FHAs). If insufficient information for this determination is included in these analyses, a subject matter expert is assigned to document a new consequence determination. The scope of the ISA does not include initiating events caused by acts of war or sabotage.

A qualitative risk assessment will be performed for credible accident sequences with high or intermediate consequences. Nuclear criticality accident sequences will be assumed to have high consequences. The ISA Summary provides a definition of the qualitative risk assessment methodology.

The ISA Summary will provide a description of each credible accident or bounding accident condition with intermediate or high consequences of concern.

#### 3.1.6 Identification of Items Relied On For Safety (IROFS)

After determination of potential accident sequences that result in consequences of concern, the IROFS will be identified for prevention or mitigation of these accidents. The reliability characteristics of the system of controls will be evaluated to ensure that high-consequence events are highly unlikely and that intermediate consequence events are at least unlikely as defined in the ISA Summary. Management measures for ensuring the availability and reliability of IROFS are described in Chapter 11.

### 3.2 **Chemical Hazards**

An evaluation of chemical use at this facility shall be performed against the criteria of 10 CFR 70.61, i.e. chemical hazards of licensed materials and hazardous chemicals produced from licensed material. This evaluation need not include hazardous chemicals prior to co-mingling with SNM or after they have been separated from SNM (except as potential initiating events that may adversely impact safety of SNM activities in other areas). The ISA Summary includes the quantitative chemical exposure criteria that define high or intermediate consequences.

### 3.3 **ISA Summary and ISA Documentation**

The ISA Summary is a stand-alone document and includes the following elements:

- General description of the site.
- General description of the facility.
- Description of facility processes, hazards, and types of accident sequences.
- Demonstration of compliance with 10 CFR 70.61 performance requirements.
- Description of the ISA team qualifications and ISA methods.
- Descriptive list of IROFS highlighting sole IROFS, if any.
- Definitions of the terms “credible”, “unlikely,” and “highly unlikely.”

Framatome’s ISA Summary is provided as E10-04, “ISA Summaries,” January 27, 2006, or as subsequently revised.

The ISA Summary will be updated at least annually by January 30 when changes affecting the summary have been made that did not require pre-approval in accordance with 10 CFR 70.72. A copy of this summary, along with its annual updates, will be submitted to the NRC.