EHS&L Document

SNM-1227 - Chapter 1
General Information

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 19 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)		☒	Document Control (Automatic)	☒
Change Author	CD Manning	☒	Author	☒
Independent Technical Review		☐		
Operability Review(s)			Mgr, Richland Operations[1]	☐
Conversion		☐	Mgr, Uranium Conversion & Recovery Operations[1]	☐
Recovery		☐		
Ceramics		☐	Mgr, Ceramic Operations[1]	☐
Rods		☐	Mgr, Rods & Bundles[1]	☐
Bundles		☐		
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]	☒
Criticality	WL Doane	☒	Mgr, Nuclear Safety[2]	☐
Radiation Protection		☐		
Safety		☐	Mgr, Safety[2]	☐
Security/Emergency Prep.		☐	Mgr, Security & Emergency Preparedness[2]	☐
Fire Safety		☐		
MC&A		☐	Mgr, Licensing & Compliance[2]	☐
Transportation		☐		
Environmental		☐		
Mechanics Richland Review		☐	Mgr, 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 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 ☐ Radiation Protection ☐ Safety/Security ☐ Emergency Preparedness ☐ MC&A ☐ Transportation ☐ Environmental

DOCUMENT VERSION:	EHS&L REVIEW COMPONENT:	EVALUATION DATE:	CHANGE EVALUATOR*: 2ND PARTY APPROVAL*:

The scope and content of this document have been determined by EHS&L to not directly impact the safe handling of licensed materials (enriched uranium). Future revisions to this document do not require the 10CFR 70.72 change evaluation unless the scope of the document changes such that it directly impacts the handling of licensed materials.	☐

DOCUMENT / ECN NO**:	EVALUATION DATE:	CHANGE EVALUATOR:
E10-08-001	1/19/18	CD Manning

Does the change potentially impact Criticality Alarm System (CAS) coverage?	☐ YES ☒ NO
EVALUATION OF NRC PRE-APPROVAL:	
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.	☐ YES ☒ NO
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 Summary?	☐ YES ☒ NO
2. Does the change use new processes, technologies, or control systems for which Framatome has no prior experience?	☐ YES ☒ NO
3. 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?	☐ YES ☒ 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?	☐ YES ☒ NO
5. Does the change qualify as a change specifically prohibited by NRC regulation, order or license condition?	☐ YES ☒ NO
Evaluation of Actions Required PRIOR TO OR CONCURRENT with Change Implementation:	
6. Modification / Addition to CAS system or system coverage documentation	☐ YES ☒ NO
7. Acquire NRC pre-approval (LICENSE AMENDMENT)	☐ YES ☒ NO
8. Conduct/modify ISA	☐ YES ☒ NO

9. Modify / update the following:	☒ None ☐ Other	☐ ISA Database ☐ Red-Line Drawings/P&ID	☐ NCSA ☐ NCSS	☐ NCSP ☐ PHA	☐ RHA ☐ FHA	☐ ChHA ☐ Procedures
Evaluation of Actions Required SUBSEQUENT TO Change Implementation:						
10. Modify / update the following:	☒ None ☐ Other	☐ ISA Database ☐ AS-Built Drawings/P&ID	☐ NCSA ☐ NCSS	☐ NCSP ☐ PHA	☐ RHA ☐ FHA	☐ ChHA ☐ Procedures

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.

(*) 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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1.0 General Information

1.1 *Facility and Process Information*

1.1.1 General Facility Description

The Framatome Inc. (Framatome) Richland fuel fabrication facility is located at 2101 Horn Rapids Road, just within the northern limits of the City of Richland. The fenced exclusion area of approximately 50 acres is located within 320 acres of Framatome-owned land, the remainder of which is either devoted to vehicle parking areas, is undeveloped, or is leased (currently) for agricultural purposes. The developed industrial site (fenced exclusion area plus surrounding parking areas) in relation to the overall Framatome site boundary is depicted in Figure 1-1. Additional information describing the Framatome Richland facility, including its location with respect to geographic features, roadways, population centers, industrial facilities, and public facilities, is provided in Section 1.3, “Site Description”.

1.1.2 Facility Buildings and Structures

The Framatome Richland facility contains numerous buildings plus various outside facilities/structures (tank farms, storage pads, etc.). The buildings and structures are confined within the secured fenced area and include the major SNM-processing production facilities, a number of SNM-handling production support facilities (product storage warehouses, waste treatment facilities, etc.), and a large number of non-SNM-handling production and administrative support facilities (materials warehouses, craft shops, office buildings, etc.). A map of the developed industrial site (fenced exclusion area plus surrounding parking areas) is provided as Figure 1-2.

The major site features and a statement as to their current primary function(s) are provided below. The current facility functions are provided for informational purposes and are not intended to be restrictive of future potential activities in those facilities.

UF_6 Cylinder Storage Facility - Receipt, handling and storage of full, empty, and heel-quantity uranium hexafluoride (UF_6) cylinders, including weighing and assaying of cylinder contents.

Dry Conversion Facility Chemical conversion of UF_6 to uranium dioxide (UO_2) powder and mechanical processing of the powder (powder preparation) for subsequent pellet pressing.

UO_2 Building Pressing of UO_2 powder into pellets and subsequent pellet sintering and grinding. Loading of finished pellets into fuel rods and assembly of fuel rods and associated hardware into fuel bundles. Loading of products (powder, pellets, fuel rods, assemblies) for shipment. Recovery of uranium via the ammonium diuranate (ADU) and supercritical CO_2 ($SCCO_2$) processes. Bulk UO_2 storage. Analytical laboratory and UF_6 cylinder washing activities.

Specialty Fuels (SF) Building Production of UO_2 fuel pellets (blending, pressing, sintering, grinding) containing neutron absorber additive. Housing of the Solid Waste Uranium Recovery (SWUR) incinerator.

Engineering Laboratory Operations (ELO) Building Dissolution and solvent extraction processing of uranium fuel scrap for removal of contaminants. Laboratory facilities for research and development activities in support of fuel fabrication and related functions.

UF_6 Cylinder Recertification Facility Testing and inspection for the recertification of UF_6 cylinders.

Uranyl Nitrate Building (UNB) – Downloading of uranyl nitrate (UN) from UN shipping containers. Tank storage of UN prior to transfer to the UO_2 Building.

UNH Drum Storage Warehouse Storage of drums of uranyl nitrate solution for eventual uranium recovery processing.

Warehouse 1, 2, 3, Facility Materials receipt and storage. Loading of containers of powder/pellet product into shipping containers; loading of containers into trucks. Mechanical component operations.

Fuel Storage Warehouse (Warehouse 4) Storage of uranium-bearing product or scrap. Miscellaneous production support activities.

Warehouse 5 Shipping container storage and set-up. Miscellaneous product support and general storage activities.

Burnable Poison Pellet Production Facility/Warehouse 6 – Production of burnable poison pellets (non-SNM) for inclusion into reactor control rods. Miscellaneous production support activities.

Operations Scrap Warehouse (Warehouse 7) Storage of containers of uranium fuel feed stock, product, and scrap.

Waste Storage Facility Storage of containers (drums/boxes) of radioactively contaminated wastes awaiting off-site disposal.

Lagoon Uranium Recovery (LUR)/Solids Processing Facility (SPF) Processing of waste liquids and sludges/solids. Miscellaneous production support activities.

Ammonia Recovery Facility (ARF) Recovery of ammonium hydroxide and uranium from liquid process effluents. Temporary tank accumulation of liquid process effluents.

Modular Extraction Recovery Facility (MERF) Sorting and recovery of uranium from contaminated solid wastes.

Fuel Services Building (Building 9) Miscellaneous production support activities, including computer operations. Fuel bundle defabrication activities.

Shipping Container Refurbishment Facility Maintenance, cleaning and painting of product shipping containers; mechanical fabrication activities.

Product Development Test Facility (PDTF) Hydraulic, heat transfer, and mechanical/ seismic testing of fuel assemblies.

Machine Shop Mechanical component operations.

Maintenance Shop Maintenance craft shops and offices.

North Tank Farm Tank storage of liquid chemical feed and product materials (hydrofluoric acid, aqua ammonia, sodium hydroxide, nitric acid, nitrogen)

Carpenter Shop Carpentry/Painting activities.

Chemical Storage Warehouse Storage of containerized chemicals.

Acid/Oxidizer Storage Warehouse Storage of containerized chemicals.

Office Buildings 1 through 8 Office/Administrative functions.

Central Guard Station/Emergency Operations Center Security and emergency response operations.

1.1.3 General Process Description

The primary operation of the Framatome Richland facility is the manufacture of fuel assemblies and intermediate fuel components for commercial light-water power reactors. The primary uranium feed material to the plant is UF_6, received in 30-inch diameter steel cylinders. After receipt, weighing, and assaying at the UF_6 Cylinder Storage Facility, the cylinders are transferred to the Dry Conversion Facility (DCF) where the UF_6 undergoes chemical conversion to UO_2 powder. Also in the DCF the powder undergoes physical conditioning (powder preparation) to put it in a physical form most amenable to pellet pressing.

For pellet pressing, the UO_2 powder is transferred in containers to the UO_2 Building where it is pressed into pellets. After sintering, the pellets are normally ground to size, inspected, and placed into interim storage. As needed, the pellets are brought to the rod loading area of the UO_2 Building for loading into fuel rod cladding. The loaded and end-capped rods are then available for combining with appropriate fuel bundle hardware to produce finished fuel assemblies. This work takes place in the bundle assembly area within the UO_2 Building. Finished bundles are placed in interim storage or loaded into bundle shipping containers for ultimate transport to utility customers.

A number of noteworthy process flow variants exist relative to the typical process flow outlined above, most notably:

- The final product is not always finished fuel assemblies, but instead may be either uranium oxide powder or pellets, or finished fuel rods. These products are removed from the process at the appropriate point and loaded into licensed shipping containers for shipment to other licensed facilities.
- Fuel pellets containing gadolinia (neutron absorber fuel) are produced in the Specialty Fuels (SF) Building. UO_2 powder produced on-site in the UO_2 Building or DCF, as previously discussed, is blended with gadolinia. The resulting blended powder is pressed into pellets; the pellets are sintered, normally ground to size, and inspected. The finished pellets are transferred to rod loading or, in some cases, may be packaged for shipment off-site to other fuel fabrication facilities.
- Blended low-enriched uranium (BLEU) can be received from off-site as liquid (uranyl nitrate) or as a uranium oxide powder. Liquid uranyl nitrate is off-loaded from licensed shipping containers and placed into tank storage at the Uranyl Nitrate Building (UNB). The liquid is subsequently piped from the UNB to the UO_2 Building where it is converted to uranium dioxide (UO_2) powder. BLEU received from offsite as a uranium oxide powder (UO_2) is downloaded from licensed shipping containers into storage drums at the BLEU addition to the UO_2 Building. BLEU powder, whether received from offsite as a powder or produced from uranyl nitrate received from offsite, is fed to subsequent steps of the fuel fabrication process (pelletizing, sintering, grinding, rod loading, bundle assembly).
- Scrap processing utilizes the ADU conversion process in the UO_2 Building. Uranium-bearing scrap (powder, pellets, or other uranium residues) may be generated on-site or received from off-site facilities. The scrap is dissolved in dissolvers located in the UO_2 or ELO Buildings. The resultant uranyl nitrate solutions serve as feed to the ADU conversion process. In some cases the uranyl nitrate may have been processed as an intermediate step through the solvent extraction process in the ELO Building to remove gadolinium or other contaminants. UO_2 powder produced in the ADU process is placed into drums and transferred to the DCF for powder preparation and returned to drums. This drummed ADU-

produced powder proceeds through the subsequent fuel fabrication steps in the same manner as UF_6-derived powder produced in the DCF, as previously discussed.

1.1.4 Raw Materials, Products, By-Products and Wastes

As discussed in Section 1.1.3, the primary uranium feed material for the plant is UF_6. Secondary feeds include BLEU uranyl nitrate or powder, powder or pellets from other fuel cycle facilities, and various uranium-bearing scrap materials. The production, production-support, and waste processing activities are supported by a number of non-radiological chemical materials, most notably bulk quantities of aqua ammonia, nitric acid, nitrogen, and sodium hydroxide. A significant number of chemicals are utilized on-site in lesser quantities.

Finished products of the plant containing licensed material include fuel assemblies, fuel rods, uranium oxide pellets, and uranium oxide powder.

Byproducts produced at the Richland plant include hydrofluoric acid recovered from the dry conversion process and ammonium hydroxide (aqua ammonia) recovered from the ADU process. Recovered hydrofluoric acid is sold as a commercial chemical product; recovered aqua ammonia is recycled into the ADU process but may also be sold as a commercial chemical product. License authorizations exist for the release of these materials (see Section 1.2.5).

The site processes produce liquid, solid, and airborne wastes. Liquid process wastes are collected within the plant's wastewater treatment system. The system provides processes for the treatment/removal of certain constituents and characteristics (ammonia, uranium, particulates, pH) prior to the treated effluent being combined with domestic sewage and other non-hazardous liquid effluents. The combined liquid effluent, after having been sampled for applicable radioactive and non-radioactive chemical constituents, is discharged to the City of Richland sewer at a lift station located immediately to the south of the plant site. Small volumes of certain liquid wastes are containerized for treatment/disposal at appropriate off-site facilities.

The site produces a variety of regulated solid wastes (obsolete equipment and hardware, used ventilation filters, used personal protective equipment, waste treatment residues/filter cakes, demolition debris, miscellaneous combustible waste, etc.). These wastes are typically containerized for shipment off-site to an appropriate low-level waste disposal site. Certain combustible wastes are burned in the on-site SWUR incinerator.

The site facilities discharge airborne effluents to atmosphere via a number of process stacks. All process stacks exhausting air that may contain concentrations of radioactive materials that are significant with respect to the site's compliance with 10 CFR 20 are provided with high-efficiency particulate absolute (HEPA) filtration and continuous sampling for radioactive particulates. A subset of those stacks also emits certain chemical contaminants (oxides of nitrogen, hydrogen fluoride) and is provided with appropriate liquid scrubbers; emissions are quantified via stack monitoring/testing.

Levels of trace radioactive impurities or contaminants (fission products, transuranic elements) in products, by-products, and wastes produced at the Richland plant are a function of the composition of the feed materials to the plant and the processes applied to these materials. Transuranics in feed materials are limited by license condition (see Section 1.2.5) to 50 Bq/gU. Although not a license condition, most feed UF_6 meets the radiological limits for commercial grade UF_6, as specified in ASTM Standard C-996 (2004). Similarly, most non-UF_6 uranium-bearing scrap feeds meet commercial-grade radiological limits specified in ASTM Standard C-1334 (2005); BLEU material feeds meet the reprocessed uranium specifications of ASTM

C-1334 (2005). Uranium fuel products must meet radiological criteria, including isotopic purity limits, imposed by Framatome customers. Processing of all feed materials is managed such that worker exposures meet 10 CFR 20 occupational exposure limits and wastes meet the effluent criteria of 10 CFR 20.

1.2 *Institutional Information*

1.2.1 Corporate Identity

The full name and address of the applicant and the facility is as follows:

Framatome Inc.

2101 Horn Rapids Road

Richland, Washington 99354

The U.S. Nuclear Regulatory Commission (NRC) license number for this facility is SNM-1227 (Docket No. 70-1257).

The facility is located within the City of Richland, Benton County, State of Washington.

The applicant is incorporated in the State of Delaware, with its principal corporate offices located at:

3315 Old Forest Road

Lynchburgh Virginia

Framatome Inc. is a Delaware corporation with headquarters in Lynchburgh, Virginia. Framatome Inc. is, in turn, wholly-owned subsidiary of Framatome SAS, simplified joint stock company headquartered in Courbevoie, France and incorporated at the registry of commerce of Nanterre under number 379 041 395.Financial Qualifications

Framatome provides decommissioning financial assurance to the NRC via a financial assurance mechanism provided for in 10 CFR 70.25(f) (see Section 10.3). Evidence of such financial assurance is provided as part of its Decommissioning Funding Plan.

1.2.2 Type, Quantity, and Form of Licensed Material

1.2.2.1 Uranium-235

1. Three hundred fifty (350) grams, in addition to the limits listed below, of any enrichment or chemical/physical form for analytical/testing purposes and for sources.
2. [redacted] kilograms contained in uranium compounds in any chemical/physical form enriched to a maximum of 5 wt. % in the U-235 isotope.

The uranium compounds containing the U-235 isotope may include enriched reprocessed uranium materials and their associated radioisotopes, including plutonium and other transuranic isotopes (see Section 1.2.5.1).

1.2.3 Authorized Uses

This license authorizes the use of special nuclear material for the production of uranium fuel products for ultimate usage in nuclear power reactors. This also includes all support activities related to the production of these products, including but not limited to the receipt and storage of

raw materials; the storage of finished products and the preparation/offering of these products for transportation off-site; SNM recycling/recovery operations; the processing/disposal of SNM-containing waste materials, excluding on-site burial; process and product development activities; laboratory operations; and maintenance/repair of contaminated equipment and facilities.

This license application requests renewal of License No. SNM-1227 (expiration date November 30, 2006) and meets the 30-day timely renewal criterion of 10 CFR 70.38. The requested renewal period is forty (40) years.

1.2.4 Special Exemptions and Special Authorizations

1.2.4.1 Plutonium and Other Transuranic Contamination in Feedstock

Framatome may receive, process, store, and ship reprocessed uranium containing plutonium and other transuranic isotopes.

1. The concentration of transuranic isotopes (i.e., the alpha activity of plutonium and neptunium) in such uranium shall be limited to less than 50 Bq/gU.
2. When it expects to receive such uranium, Framatome shall obtain certification from the shipper that the uranium is within the limits for transuranics as specified in Item 1, above.
3. Framatome may receive, store, analyze and ship up to 200 gU of samples of reprocessed uranium whose transuranic activity exceeds 50 Bq/gU for purposes of confirming transuranic activity. If it is confirmed that the sample exceeds this limit, Framatome will either blend the remaining sample material to comply with the limit or return it to the shipper.

1.2.4.2 Labeling Exemption

Pursuant to 10 CFR 20.1904(a) requirements, a sign bearing the legend, “Every container or vessel in this area, unless otherwise identified, may contain radioactive material,” may be posted at entrances to each building in which radioactive materials are used, stored or handled, in lieu of the requirement to have a “Caution, Radioactive Material” or “Danger, Radioactive Material” label affixed to each container of licensed material.

1.2.4.3 Waste Disposal

Pursuant to 10 CFR 20.2002, disposal of solid waste material containing uranium at 30 pCi/ gram or less to other than a licensed waste disposal facility is authorized. The low enriched uranium shall not exceed 30 pCi/gram of dry solid waste material. The uranium shall be distributed throughout the waste material.

1.2.4.4 Authorization at Reactor Sites

Framatome is authorized to possess fuel assemblies or fuel rods at reactor sites, within the license requirements of the reactor site, for the purposes of loading them into shipping containers and delivering them to a carrier for transport.

For such operations, Framatome shall be exempted from conditions of 10 CFR 70.24, “Criticality Accident Requirements,” provided:

- As finished fuel assemblies are removed from their storage facilities, they shall be constrained in an arrangement that is no more reactive than that which they will assume in the shipping package.
- The total number of fuel assemblies in process at any one time shall not exceed the maximum authorized contents of the package being loaded.
- If two fuel assemblies are in movement at the same time, a 12-inch-minimum edge-to-edge separation shall be maintained between them, and only one fuel assembly at a time shall be loaded into the shipping package.
- Loaded packages will be stored in an approved shipping array pending delivery to a carrier.

1.2.4.5 Notification

Notifications to the NRC shall be made as required by regulations, with the exception of 10 CFR 20.2202(a)(2) and (b)(2) as they apply to restricted areas. Reports to the NRC shall be made as required by regulations, with the exception of those paragraphs in 10 CFR 20.2203 that refer to 10 CFR 20.2202(a)(2) and (b)(2) as they apply to restricted areas.

1.2.4.6 Authorized Release Guidelines for Hydrofluoric Acid

Framatome is authorized to release hydrofluoric acid manufactured by the dry conversion process for unrestricted commercial use, provided the following conditions are met:

1. A representative sample of each batch of hydrofluoric acid product shall be obtained and analyzed for uranium.
2. A batch shall be no larger than the capacity of the applicable storage tank.
3. The uranium activity of any batch released for unrestricted use shall be $\leq$ 3 pCi/ml.

1.2.4.7 Authorized Release Guidelines for Ammonium Hydroxide

Framatome is authorized to release ammonium hydroxide produced at the Ammonia Recovery Facility for unrestricted commercial use, provided the following conditions are met:

1. A representative sample of each batch of ammonium hydroxide product shall be obtained and analyzed for uranium.
2. A batch shall be no larger than the capacity of the applicable storage tank.
3. The uranium concentration in the ammonium hydroxide shall not exceed 0.05 ppm.

1.2.4.8 Material Control and Accounting

Framatome will comply with the requirements of its Fundamental Nuclear Material Control Plan (E07-01-001, Version 2.0, dated June 27, 2006, or as subsequently revised) in accordance with 10 CFR 70.22 and 10 CFR 74.

1.2.4.9 Physical Protection

Framatome will comply with the requirements of its Physical Protection Plan (E09-03-001, Version 3.0, dated October 20, 2006, or as subsequently revised) in accordance with requirements for protection of SNM of low strategic significance specified in 10 CFR 73.

1.2.4.10 Release from Prior Commitments

All commitments made to NRC staff prior to the approval date of this license application shall no longer be binding on Framatome following approval of this license application, unless re-imposed as license conditions.

1.2.4.11 License Application Changes without NRC Pre-approval

The licensee may make changes to the License Application and/or to supporting documents referenced in the license, without prior NRC approval, provided that the following conditions are met:

- The change does not decrease the level of effectiveness of the design basis as described in the license application;
- The change does not result in a departure from methods of evaluation as described in the license application and used in establishing the design basis;
- The change does not result in a degradation of safety;
- The change does not adversely impact regulatory compliance or conflict with other license conditions;
- The change is supported by a written technical/safety justification that includes management approval and is maintained onsite for NRC inspection; and
- The change is conveyed, including revised license chapters, to the Director, Office of Nuclear Material Safety and Safeguards, with a copy to the appropriate NRC Regional Office, within six months after the change is made.

1.2.5 Terminology

The following definitions apply to terms as used in this license:

Term	Definitions
Weekly	Within each calendar week
Monthly	Within each calendar month
Quarterly	Within each calendar quarter
Biannually or Semi-Annually	Twice per year with an interval not to exceed 8 months
Annually	Once per calendar year with an interval not to exceed 15 months
Biennially	Every second calendar year with an interval not to exceed 27 months
Triennially	Every third calendar year with an interval not to exceed 40 months

1.3 ***Site Description***

1.3.1 Site Geography

The Framatome Richland fuel fabrication facility is located at 2101 Horn Rapids Road, just within the northern limits of the City of Richland in Benton County, Washington. The fenced exclusion area of approximately 50 acres lies within 320 acres of land owned by Framatome within the Horn Rapids Industrial Park. The property is situated at approximately latitude N46°21’003” and longitude W119°18’020” in Sections 15 and 16 of Township 10N, Range 28E,

Willamette Meridian. The facility itself is located in the southwest quarter of Section 15 (15-SW/4).

The facility is bounded on the north by Horn Rapids Road, an asphalt roadway providing access to the plant and located approximately 300 feet north of the fenced exclusion area; on the south by Battelle Boulevard, approximately 450 feet south of the fenced exclusion area; on the west by Kingsgate Boulevard, approximately 2,500 feet to the west of the fenced exclusion area, and on the east by Kelly Avenue, approximately 750 feet to the east of the fenced exclusion area. Stevens Drive, the primary route south into Richland, is approximately 4,000 feet to the east. There are no major highways in the immediate vicinity of the plant.

There are no bodies of surface water adjacent to or in the immediate vicinity of the plant. The Columbia River is located approximately 1.5 miles to the east and the Yakima River, a tributary to the Columbia, passes approximately 2 miles to the west. The Columbia River, the much larger of the two, is regulated by multiple dams upstream of Richland. At its closest point, the site lies approximately 25 feet above the normal level of the Columbia.

The immediate area surrounding the site is a relatively flat and essentially featureless plain. There are no significant geographic features that may impact accident analyses within one mile of the site.

1.3.2 Demographics

The Framatome Richland plant is located within the Horn Rapids Industrial Park and therefore there are no residences adjacent to or in the immediate vicinity of the plant. The nearest residential areas are about 1.5 miles to the southwest in the City of Richland. The City of Richland, with a current approximate population of 49,571 (2011), is a part of the Tri-Cities metropolitan area. Other major population centers within the Tri-Cities metropolitan area include Kennewick, also located within Benton County, at a distance of approximately ten miles southeast of the plant [approximate population 76,224 (2011)]; Pasco, located in adjacent Franklin County, at a distance of approximately seven miles southeast of the plant [approximate population 63,186 (2011); and West Richland, in Benton County, at a distance of approximately five miles southwest of the plant [approximate population 12,184 (2011)].

There are no public facilities (schools, hospitals, parks) in the immediate vicinity of the plant site. The nearest schools, WSU at Tri-Cities and the Hanford Middle School/High School, are approximately two miles southeast of the plant and the northernmost portion of Leslie Groves Park along the Columbia River is about three miles southeast of the site. The West Richland Public Golf Course is approximately 3.5 miles southwest of the plant. The nearest hospital, Kadlec Hospital, is located approximately five miles south of the plant in Richland.

Land use within the one mile zone around the plant is a mixture of agricultural activities with a number of rather widely interspersed industrial facilities. The industrial facilities, including Pacific Eco Solutions, a low-level radioactive waste processing facility located approximately 0.5 miles from the plant, do not manage hazardous materials in quantities that pose hazards to the Framatome facility under normal or off-normal conditions. The land north of the Framatome site, across Horn Rapids Road, is part of the approximately 550-square-mile U.S. Department of Energy (DOE) Hanford Site. The nearest major Hanford operational area, the 300 Area, is located approximately three miles north of the plant. It has no remaining significant industrial activities and is being progressively shut down. Similarly, the U.S. DOE Fast Flux Test Facility, located seven miles north of the plant, is shut down and being decommissioned. The Energy

Northwest Columbia Nuclear Generating Station is located eight miles north of Framatome; as such, Framatome is within the ten-mile emergency planning zone for that facility.

The Columbia and Yakima Rivers, located 1.5 and 2 miles, respectively, from the plant, are used primarily for recreational purposes (boating, fishing, etc.) and serve as a source of irrigation water for agricultural activities. The Columbia River serves as a source of drinking water for Richland and the immediately downstream communities of Kennewick and Pasco. The Columbia River is also utilized by a limited number of cruise boats visiting the Hanford Reach portion of the river and very infrequently by barges delivering large components to the Hanford Site.

1.3.3 Meteorology

The prevailing wind at the Framatome site is from the southwest along the Yakima River corridor, which enters the Columbia Basin near the site. Secondary direction frequency maxima are from the northwest and the southeast along the axis of the Columbia River valley, and the lowest frequencies are from the east and northeast. Based on long-term wind speed data from the adjacent DOE Hanford Site, wind speeds are between 1 to 12 mph approximately 88% of the time (36.8% at 4 to 7 mph, 32.5% at 1 to 3 mph, and 18.6% at 8 to 12 mph).

Benton County is subject to high winds and blowing dust. Wind speeds can reach 60+ miles per hour. The Framatome Richland facility, located on the southern border of the Hanford region, experiences high wind speeds due to squall lines, frontal passages, strong pressure gradients, and thunderstorms. The Hanford historical wind speed-direction data show that daily peak gusts of at least 40 mph have occurred from all but 4 of the 16 compass points.

Based on historical Hanford area wind data, the peak gust of wind at 50 feet of elevation expected to occur once in 100 years is 86 mph. This gust speed translates to a fastest mile wind speed of 66 to 78 mph. The fastest mile of wind is generally defined as either the fastest speed associated with one mile of passing wind or the fastest observed one minute wind speed. The facilities at the Framatome Richland facility are designed and constructed in accordance with the Uniform Building Code to withstand sustained winds of 80 mph without appreciable damage.

The Tri-Cities region has a very dry climate with rather mild winters and warm sunny summers. The average annual precipitation in the Richland area is approximately 6 to 6.5 inches, with nearly half of the precipitation occurring during November, December and January. Most of the precipitation occurs as rain.

Based on historic data, the Hanford area can expect two inches of rain in 24 hours once per 100 years. The probable maximum precipitation (PMP) event calculated for the Columbia Generating Station of Energy Northwest (located approximately 8 miles northeast of Framatome) is 9.2 inches of rain in five hours from a thunderstorm. Building roofs at the Framatome Richland facility are designed for a rain load of 20 lb/ft^2 (approximately 4 inches of water) and have adequate drainage.

The average annual snowfall in the lower Columbia Basin is approximately 14 inches. Four to six inches is the average depth of snow that stays on the ground for two to four weeks. Building roofs at the Framatome Richland facility site are designed for a snow load of 20 lb/ft^2 (approximately 24 inches of fresh snow) and have adequate drainage.

No tornados have been sighted in Benton County since 1956; however, between 1950 and 1980, two sightings were recorded in adjacent Grant County and three events were recorded in

adjacent Walla Walla County. Due to the low frequency of tornados in this area, no specific design criteria relative to tornados are required in the Uniform Building Code (UBC).

Because the lightning risk to the Framatome Richland facility site is low, the design bases for the facility buildings do not include protection against lightning. The most probable consequence of a lightning strike on the Framatome Richland facility site is a loss of normal power. Electronic components may be damaged and, in certain highly unlikely circumstances, emergency back-up power could be lost to some equipment. It is also possible, but highly unlikely, that a fire at the site could be initiated by lightning.

1.3.4 Hydrology

There are no bodies of surface water adjacent to or in the immediate vicinity of the plant. The Columbia River, approximately 1.5 miles to the east, is historically subject to flooding but is now highly regulated by the many dams upstream of Richland within the State of Washington and province of British Columbia. The Yakima River, approximately 2 miles to the southwest, is a source of recharge for the shallow, unconfined groundwater aquifer below the site. Recharge to that aquifer also occurs from infiltration of precipitation runoff from ridges surrounding the Columbia Basin as well as from the infiltration of irrigation water applied to farmland directly upgradient of the plant.

Depth to water table in the vicinity of the plant ranges from approximately 10 to 50 feet below land surface but is typically only approximately 15 to 20 feet below land surface in the fenced portion of the facility. The unconfined aquifer is typically 20 feet thick and is separated from the lower confined aquifer by a 30- to 35-foot-thick silt aquitard. The groundwater beneath the site exhibits a very flat gradient and flows from south-southwest to north-northeast at an estimated average groundwater flow velocity range of from 2 to 8 feet/day. A potentiometric surface map for the groundwater beneath the site is provided as Figure 1-3.

The Framatome Richland facility site lies between the Yakima and Columbia Rivers. The flows of both rivers are regulated by multiple dams upstream of the site. Floods have historically been a common hazard in Benton County, but on the DOE Hanford Reservation adjacent to the Framatome Richland facility, the probable maximum flood, as determined by the Corps of Engineers, would have little effect on the area as a whole. Historical flood frequency data for the Hanford area shows that a 500-year flood from rainfall or snowmelt will not reach the Framatome Richland facility with or without the presence of the flood control dams on the Yakima, Columbia, and Snake Rivers. Therefore, flood-related hazards are not considered a viable risk at the site.

1.3.5 Geology

The Columbia Basin is underlain by thick sequences of basaltic lava flows more than 10,000 feet thick. Within the area of the basaltic lava flows are a number of structural basins containing layers of unconsolidated sands and gravels tens to hundreds of feet thick over the basaltic bedrock. The Framatome site lies near the southwestern margin of the largest of such structural basins, known as the Pasco Basin. Underlying the site itself are poorly and well-graded sands and gravels that, in turn, are underlain by a silt aquitard layer occurring from 30 to 50 feet below land surface with a thickness of 30 to 35 feet. The silt aquitard separates the unconfined groundwater aquifer in the sands and gravels above it from the confined aquifer in the sands and gravels below it.

The UBC Seismic Risk Map places the Framatome site within Seismic Zone 2B. The UBC for this seismic zone requires structures to be able to withstand a peak ground acceleration (PGA)

of 0.20g. The Framatome Richland facility plant structures are designed to withstand this level of earthquake acceleration with no significant structural damage. As such, the buildings will withstand acceleration associated with a Seismic Zone 2B event without experiencing a loss of geometry control provided by the facility design.

The U.S. DOE Hanford Site, which is adjacent to Framatome, has been extensively investigated for earthquake potential. The records of eastern Washington show only infrequent, low-intensity, deep earthquakes. Historical Hanford area seismic information shows that the horizontal PGA return frequencies are as follows:

Return Period (Years)	100	500	1,000	2,500	5,000	10,000	100,000
PGA (g)	0.040	0.097	0.139	0.216	0.295	0.398	0.884

During the past 100 years, there have been three earthquakes of intensity large enough to cause moderate damage to structures within 30 to 60 miles of the site, though no damage has been reported at the Framatome Richland site itself.

Most of the landslide areas in Benton County are 500 to 2,000 years old and are now stable. The Rattlesnake Hills, running along the southwest boundary of the Hanford Reservation and extending to the west of Kennewick, have steep slopes (over 15%), with some slopes greater than 50%, but these areas are also stable at present. There are no steep or unstable slopes on site or adjacent to the Framatome Richland facility.

The most recent volcanic activity affecting the plant site via minor ash fall was the eruption of Mt. St. Helens in 1980. The lower-activity 2004 eruption did not affect the plant site. Relatively recent eruptions of other volcanoes that affected Washington State include eruptions of Mt. Baker (1975), Mt. Hood (1800 to 1804), Mt. Rainier (1820 to 1894), and Mt. Adams (1000 to 2000 years ago). An eruption of one of these volcanoes, as well as Mt. St. Helens, could possibly lead to ash fall at the Framatome Richland facility site. No other serious effects are likely.

Figure 1-1 Fuels Manufacturing Plant Arrangement

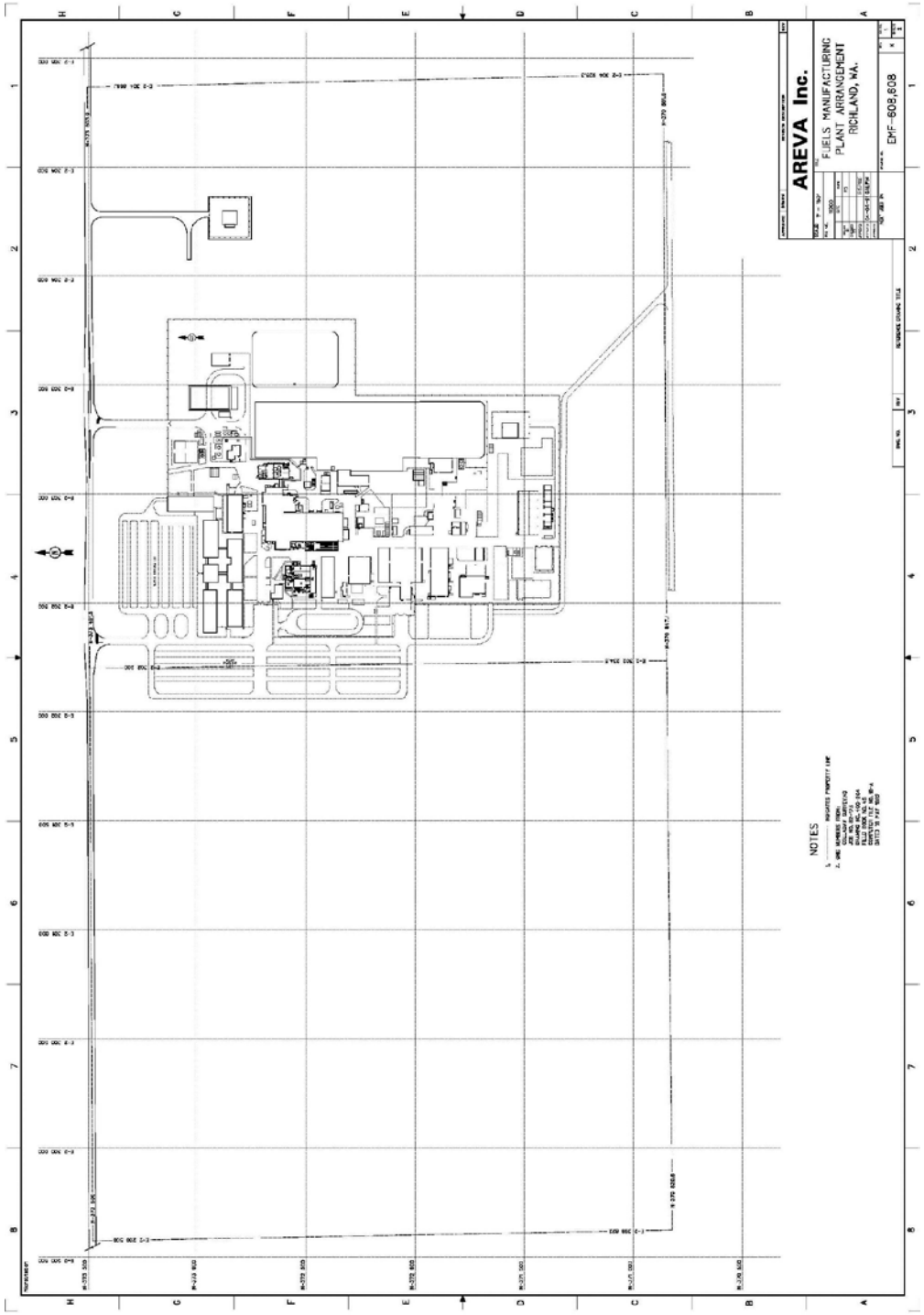

Figure 1-2 Site General Arrangement

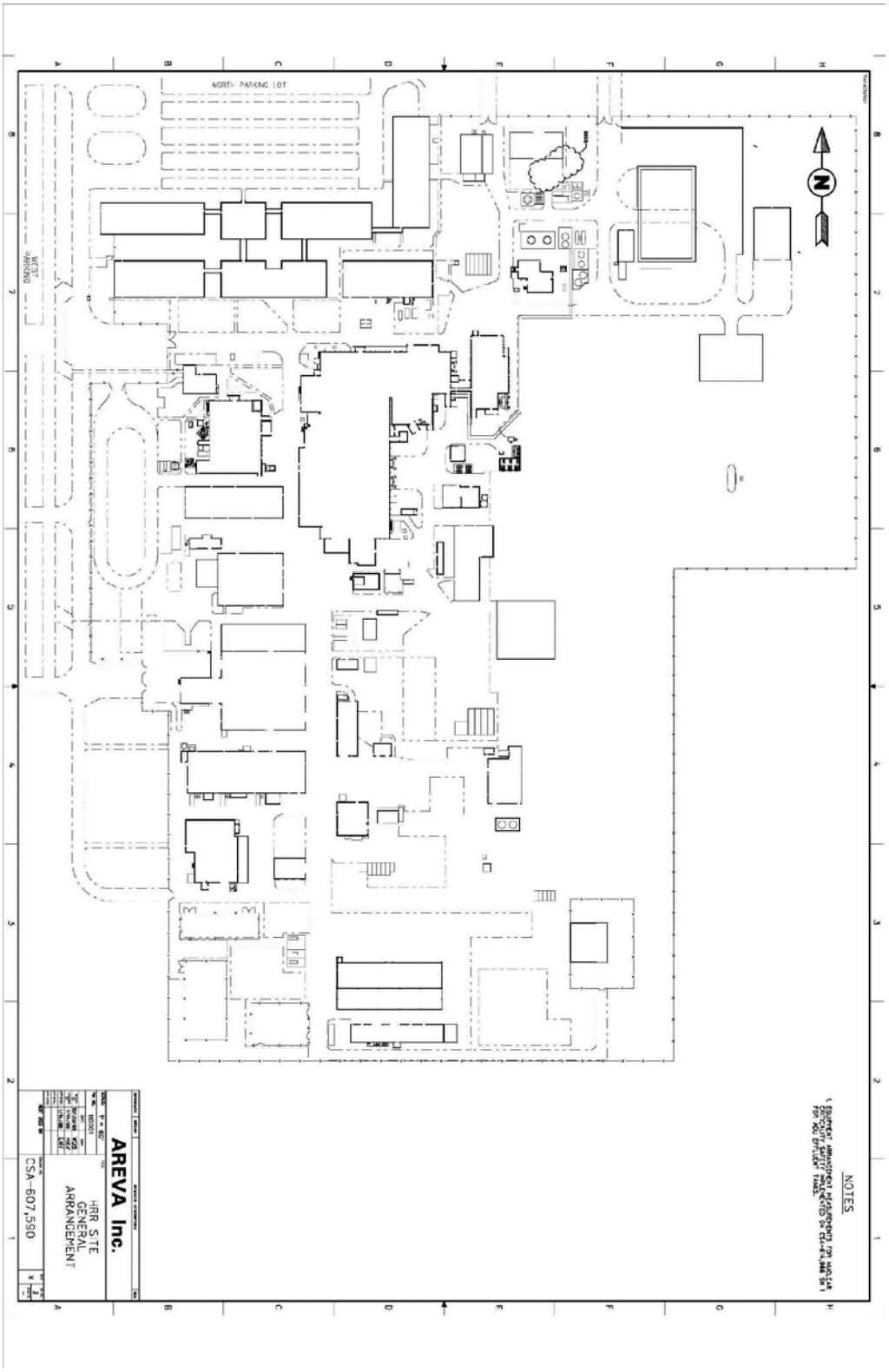

Figure 1-3 Groundwater Potentiometric Surface Map