



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

January 2, 2003

Mr. Robert E. Link, Site Manager
Framatome ANP, Inc.
2101 Horn Rapids Road
Richland, Washington 99352

SUBJECT: NRC INSPECTION REPORT 70-1257/02-08

Dear Mr. Link:

On December 2-6, 2002, the NRC conducted a routine inspection at the Framatome ANP facility in Richland, Washington. The purpose of the inspection was to determine whether activities authorized by your license were conducted safely and in accordance with NRC requirements. The program areas examined during the inspection were operations and waste management. Within those areas, the inspection consisted of a selective examination of procedures, representative records, equipment, facilities and interviews with personnel. An exit briefing was conducted on December 5, 2002, with members of your staff.

Activities conducted at the facility were generally characterized by implementation of effective programs in the areas reviewed.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available **electronically** for public inspection in the NRC Public Document Room **or** from the *Publicly Available Records (PARS) component of NRC's document system (ADAMS)*. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Dr. D. Blair Spitzberg at (817) 860-8191 or Wayne Britz at (817) 860-8194.

Sincerely,

/RA DBSpitzberg acting for/

Ken E. Brockman, Director
Division of Nuclear Materials Safety

Docket No.: 70-1257
License No.: SNM-1227

Enclosure:
NRC Inspection Report
70-1257/02-08

Framatome ANP, Inc.

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 70-1257

License No.: SNM-1227

Report No.: 70-1257/02-08

Licensee: Framatome ANP, Inc.

Facility: Framatome ANP, Inc.

Location: Richland, Washington

Dates: December 2-6, 2002

Inspectors: Wayne L. Britz, Fuel Cycle Facility Inspector
Fuel Cycle/Decommissioning Branch

Larry Berg, Reactor Inspector,
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Approved By: D. Blair Spitzberg, Ph.D., Chief
Fuel Cycle/Decommissioning Branch

Attachment: Supplemental Inspection Information

EXECUTIVE SUMMARY

Framatome ANP, Inc.
NRC Inspection Report 70-1257/02-08

This routine, announced inspection included a review of selected aspects of the licensee's program for radioactive waste management and operational safety review.

Radioactive Waste Management (88035)

- Liquid and gas effluents were less than the applicable limits specified in the license. The solid waste program was adequately planned and was being effectively operated to reduce the solid wastes on the site (Section 1).

Waste Generator Requirements (84850)

- The licensee's programs and procedures to maintain control and quality assurance of radioactive waste shipments were found to be adequate. Radioactive waste shipments made were in compliance with applicable requirements (Section 2).

Operational Safety Review (88020)/Followup (92701)

- The inspectors reviewed the licensee's corrective actions committed to in response to the April 2-3, 2002, loss of criticality control event. The licensee had developed an action plan and status report which contained the topical headings of 1) management and supervisory accountability, 2) worker training and qualification, 3) procedural work-arounds, 4) adequacy of root cause evaluations, 5) requirements flow-down, and 6) configuration management system adequacy. The corrective action plan contains some items that will be implemented over a longer period of time including up to May 1, 2005. The longer term corrective actions to be followed up on in future inspections include restructuring the standard operating procedure program, continued development of standard work instructions, implementation of an improved training program, making procedures more readily accessible to operators (terminals/paper copies/standard work instructions), continued training in root cause analysis and making control improvements in the configuration management system. The inspectors determined that the licensee's commitments as detailed in their letter to the NRC dated September 26, 2002, *Reply to a Notice of Violation*, were on schedule and that substantial progress had been made. This item will remain open until the corrective actions are completed (Section 3).
- The licensee had improved procedural controls through the use of digital pictures on some postings to clearly describe the type of containers approved for storage(Section 3).

Report Details

Summary of Plant Status

The dry conversion facility (DCF), fuel pellet production, fuel rod downloading, engineering laboratory operations (ELO), lagoon uranium recovery (LUR), ammonia recovery facility (ARF), gadolinium recovery, modular extraction/recovery facility (MERF), solids processing facility (SPF) and the solid waste uranium recovery (SWUR) were in operation. The Line 2 ammonium diuranate (ADU) recovery process was not in operation.

1 Radioactive Waste Management (88035)

a. Inspection Scope

The inspectors toured the radioactive waste facilities and discussed the operations with the licensee's representatives. The inspectors also reviewed records for the control and release/disposal of the liquid, gas and solid radioactive wastes and semi-annual reports for effluents released as required by 10 CFR 70.59.

b. Observations and Findings

The inspectors reviewed the data for the release of radioactive gaseous effluents through the plant stacks for the period July 1, 2001, to June 30, 2002. The plant stack filters are changed weekly, counted by the health and safety technicians, and reported to safety, security and licensing for recording, reporting and data analysis to assure compliance with the regulations. The instruments are source checked daily and calibrated quarterly. The inspectors observed the stack sampling and flow measurement equipment. Plant gaseous effluents have remained very low. The reported gaseous releases for the period July 1 to December 31, 2001, were 3.69 microcuries of alpha activity and -0.19 microcuries of beta activity, and from January 1 to June 30, 2002, were 3.45 microcuries of alpha activity and -2.43 microcuries of beta activity. The calculated doses to the public from the gaseous releases were also a small fraction of the NRC and Environmental Protection Agency (EPA) dose limits to the public. The licensee's gaseous effluents were well below applicable limits as required in 10 CFR 20.1302, well below the uranium isotopic concentration limits of Appendix B, Table 2 of 10 CFR 20 and License Condition Section 5.1.1, *Gaseous Effluent Controls*.

The inspectors reviewed the July 2001 to June 2002 data for the plant effluent monitoring stations for liquid effluents. The reported uranium liquid releases to the sewer effluent to the City of Richland for that period were less than the lower limit of detection (LLD). During this period, technetium-99 was detected in the effluents as a result of processing uranium cross contaminated with reprocessed uranium from another facility. The technetium-99 releases were 0.208 Curie for the period July 1 to December 31, 2001, and 0.418 Curie from January 1 to June 30, 2002. The 0.418 Curie release for the first half of 2002 is a significant portion of the 1 Curie annual 10 CFR Part 20.2003(a)(4) release limit. The licensee is managing the release of the technetium-99 to prevent exceeding the

limit. The licensee's effluents were within the applicable limits in the License Condition Section 5.1.2, *Liquid Effluent Controls* .

The licensee's audits, *Semi-Annual Environmental Monitoring Audit Summary*, dated December 4, 2002, and the second and third quarter *Environmental Audit/HP-7*, dated July 1 and September 30, 2002, were reviewed. The audits reviewed the gaseous and liquid effluent releases, monitoring and controls for releases to the atmosphere and environment. The audits were thorough and included constructive observations.

The inspectors reviewed the licensee's overall program for management of radioactive solid wastes. The lagoon inventory reduction plan provides for the closure of the lagoons by September 2004, in accordance with the consent decree with the State of Washington. The licensee's lagoon processing plans have been aggressively set to assure the completion of the processing ahead of the September 2004 date. Lagoon 3 is in the final stages of cleanup of the remaining solids in the bottom of the lagoon. From January through November 2002, the radioactive solid waste inventory has been reduced from about 60,000 cubic feet to about 34,000 cubic feet. The activities contributing the most to the reduction of onsite waste storage have been due to decontamination, shipping to a waste disposal facility, and operation of the modular extraction/recovery facility (MERF) and the solid waste uranium recovery facility (SWUR). It is expected there will be less than 30,000 cubic feet of solid waste inventory in storage on the site by the end of 2002 and that the MERF facility will complete the processing of its intended wastes by the end of 2003.

The inventory of radioactive solid waste was reviewed and the storage locations were inspected. The solid waste storage areas were posted and the drums were labeled in accordance with the regulations. The inspectors found the solid waste program to be adequately planned and was being effectively operated to reduce the solid wastes on the site.

c. Conclusions

Liquid and gas effluents were less than the applicable limits specified in the license. The solid waste program was adequately planned and was being effectively operated to reduce the solid wastes on the site.

2 Waste Generator Requirements (84850)

a. Inspection Scope

The inspectors reviewed the licensee's procedures and quality assurance to ensure compliance with the requirements of 10 CFR Parts 20 and 61 applicable to low-level radioactive waste form, classification, stabilization, and shipment manifests/tracking.

b. Observations and Findings

The inspectors reviewed the licensee's procedures, manifests, and shipment files to determine compliance with the regulations contained in 10 CFR Part 61.55, *Waste Classification*, and 61.56, *Waste Characteristics*, Part 20.2006, *Transfer for Disposal and Manifests* and Appendix G to Part 20, *Requirements for Transfers of Low-Level Radioactive Waste Intended for Disposal at Licensed Land Disposal Facilities and Manifests*.

The inspectors reviewed the preparation of waste drums for shipment to a waste burial facility and discussed the licensee's method of assuring that less than one percent of free standing liquids was present in the drums of solid waste. The inspection of the drums for integrity before shipment was observed to be very thorough. The inspectors also observed the loading of the vehicles for shipment, the radiological inspection and the safety inspection of the vehicles. The inspections of the containers and vehicles were thorough and in accordance with site procedures P66,1265, *Preparing Low Level Radioactive Waste and Mixed Waste Shipments*, P66,933, *Preparation of Stored Waste Container for Off-site Shipment*, and the regulations.

The inspectors reviewed procedure P66,933, *Preparation of Stored Waste Container for Off-site Shipment*, which addresses waste preparation, inspections, manifests, tests and sampling for hazardous waste or uranium determination. The inspectors also reviewed completed waste manifests for the radioactive waste shipments being made during the inspection week to a radioactive waste burial facility, including the checkoff lists used to determine the completeness of the records, in the shipping files of the Traffic and Logistics group. Files from several completed shipments made during the year were also reviewed. The files contained the forms required by Appendix G to Part 20, Form 540, *Uniform Low-Level Rad Waste Manifest (Shipping Paper)* and Form 541, *Uniform Low-Level Rad Waste Manifest (Container and Waste Description)*, as well as other shipping information required. The tracking of the waste shipments was verified by the receipt of the recipient's acknowledgment of receipt of the manifest in the files. The licensee's quality waste inspectors were observed reviewing the preparation and shipments of radioactive wastes. Compliance audits performed and reviewed by the inspectors included the biannual audit *Regulated Shipment Audit (EHS&L Audit SH-1)* dated December 3, 2002. The NRC inspectors had no issues with the management, recordkeeping and quality control of waste shipments.

c. Conclusions

The licensee's programs and procedures to maintain control and quality assurance of radioactive waste shipments were found to be adequate. Radioactive waste shipments were in compliance with applicable requirements.

3 Operational Safety Review (88020)/Followup (92701)

a. Inspection Scope

(Discussed) VIO 70-1257/0203-01: Failure to maintain double contingency control for criticality safety; VIO 70-1257/0203-02, Failure to maintain configuration control for criticality safety; VIO 70-1257/0203-03, Operator failure to follow procedure requiring drum inspection and management failure to provide adequate supervision; VIO 70-1257/0203-04, Failure to identify necessary criticality safety controls in the CSA and CSS; VIO 70-1257/0203-05, Failure to include CSA and CSS requirements in the SOP.

The inspectors reviewed the status of the response to NRC reactive team Inspection Report 70-1257/0203 dated June 13, 2002, and Notice of Violation and Proposed Imposition of Civil Penalty dated August 28, 2002. The inspectors reviewed the licensee's response and commitments for corrective actions as detailed in their letter to the NRC dated September 26, 2002, *Reply to a Notice of Violation*. The corrective actions were associated with a recent event involving the filling of a 45-gallon drum with special nuclear material which did not contain a neutron-absorbing "spider" assembly, the dominant of two primary controls relied on to prevent inadvertent nuclear criticality. The licensee had developed an action plan and status report which contained the topical headings of 1) management and supervisory accountability, 2) worker training and qualification, 3) procedural work-arounds, 4) adequacy of root cause evaluations, 5) requirements flow-down, and 6) configuration management system adequacy.

b. Observations and Findings

On April 3, 2002, the licensee reported an event in accordance with NRC Bulletin 91-01 commitments concerning a loss of criticality safety control involving the filling of a 45-gallon drum with uranium oxide from 5-gallon safe batch containers. In this event, the 45-gallon drum selected for filling did not contain the requisite neutron absorber spider assembly, and the drum was filled without the primary criticality safety control.

The NRC dispatched a special team of three consisting of the Team Leader from Region IV and two experts in criticality safety from NRC Headquarters to investigate the incident to assure the root causes of the event were determined and that appropriate corrective actions were being taken by the licensee. The team inspection took place on site April 15-18, 2002. On June 13, 2002, the NRC described the results of its inspection in Inspection Report 70-1257/02-03 with the identification of the five apparent violations. Following a predecisional enforcement conference on July 26, 2002, the apparent violations were dispositioned by the NRC as a Severity Level III problem with five violations of NRC requirements.

The inspectors made the following observations during a review of the licensee's corrective actions pertaining to the cited violations:

VIO 70-1257/0203-01, and VIO 70-1257/0203-03

These violations concerned the failure to maintain double contingency control for criticality safety when an operator did not perform a required procedural step. Through a follow-on investigation, the licensee identified management and supervisory accountability, and worker training and qualification as contributory causes of the violation.

During the December 2-5, 2002, inspection, the inspectors noted that the licensee had implemented an operations safety inspection program to increase the effectiveness of management inspections through the creation of a rotation plan where an individual manager selected from a pool of managers accompanies a production area manager using a checklist. Although the checklist identifies some criticality safety related items, such as visibility of limit cards, the inspectors noted that the checklist is not all inclusive, and could result in the failure of managers to identify or recognize degraded plant conditions that require additional management oversight. In particular, the inspectors, during walk-downs through the UO₂ Building, noted criticality safety postings that were upside down or not posted in the appropriate location. The inspectors found loose criticality safety postings on the floor of an area being renovated, improperly down-posted signs declaring rooms as half-face respirator only, and supply cabinets that lacked the personal protective equipment specified on the posting attached to the supply cabinet door. Through discussions with the inspectors, the licensee indicated that it would consider the thoroughness of the checklist criteria.

The inspectors noted that the licensee had implemented monthly metrics for each product center. The inspectors noted that the number of criticality safety corrective action reports (CSCARS) were being tracked on the metric as a percentage of an estimated number of CSCARS expected to be reported through the normal course of operation. The inspectors observed that the CSCAR metric has been consistently red since the inception of the metric due to continued human performance issues similar to those which contributed to the April 3, 2002, event. The inspectors discussed this trend with the licensee staff, and determined that the number of CSCARS due to human performance should decrease as the licensee's corrective actions to prevent recurrence of the April 3, 2002, event are completed. The inspectors also noted that the licensee's establishment of a CSCAR performance metric allows for collection of useful performance data which can be used by the licensee management to justify replacement of less reliable controls with more reliable controls.

The inspectors reviewed the needs analysis performed by an external company to determine resource and training needs. The report was extensive and detailed. A dedicated manager for the Training group and an acting manager for the Operations Performance and Planning group had been hired. The inspectors discussed with these managers their understanding of the needs for enhancing site performance.

The licensee was in the process of developing and implementing standard work instructions for use at various facility work stations. The completed instructions were reviewed and found to be good operational worker aids. The licensee had completed a staffing strategy for hiring new employees to minimize the use of temporary employees and had established criteria for temporary employment in the production centers.

VIO 70-1257/0203-02

This violation concerned the failure to maintain configuration control for criticality safety when the licensee modified a piece of equipment used to handle licensed material by removing a passive engineered criticality safety control, a neutron absorbing spider assembly, and allowed the component to be returned to service without review and approval, and without utilizing the Engineering Change Notice system. The licensee identified configuration management program deficiencies/limitations as a contributory cause of the violation.

The inspectors noted that the licensee's corrective actions include using the operation safety inspection program to identify distractions in the work place. However, as noted in the discussion of VIO 70-1257/0203-01, the checklist criteria are not sufficient to ensure that work place distractions (i.e., human factors considerations) created by existing deficiencies in the configuration management program do not create conflicts with established requirements. The inspectors identified several CSCARs (CSCAR 02-029, 02-30, and 02-42) where unauthorized changes in system configurations had been made. Examples included creation and use of temporary storage areas without criticality safety approval or posting; removal of Nuclear Criticality Safety (NCS) limit cards and incorrect replacement by maintenance personnel; and solution tank contents not sampled prior to being transferred to the raffinate treatment process. Through discussions with the inspectors, the licensee indicated that it would consider the thoroughness of the checklist criteria.

VIO 70-1257/0203-04

This violation concerned the failure of the Criticality Safety Analysis and their associated Criticality Safety Specifications (CSS) to specifically identify the NCS controls for precluding the use of 45-gallon drums without installed neutron-absorbing boron spiders. The licensee identified the area of requirements flow down as a contributory cause of the violation.

The inspectors reviewed the licensee's plans to ensure that the NCS component walks down the processes for each new or revised criticality safety specification to verify the change can be appropriately and practically implemented in the lower tier documents. As this is a continuous and ongoing task, the licensee had only walked down and revised one CSS to date. The walk down and the nature of the revisions were consistent with existing program requirements. For revisions or changes to surveillance requirements, or revisions to lower tiered implementing documents (e.g., procedures), the licensee physically verifies that implementation can be accomplished.

The inspectors reviewed the licensee's efforts to develop a program for improving the criticality postings using operator input. The inspectors observed that the emphasis of the program is to ensure: 1) clarity in the postings; 2) postings are written to the appropriate comprehension level for individual operations; 3) standardization; and 4) simplification of the requirements for the operators where possible. During plant walk-downs, the inspectors observed that the licensee had begun replacing limit cards. The new limit cards met program objectives regarding clarity and simplification. The licensee had improved procedural controls through the use of digital pictures on some postings to clearly describe the type of containers approved for storage. The inspectors noted that some standard work instructions (SWIs) were now available at some work stations. The inspectors observed that the criticality safety requirements were clearly marked. When used in conjunction with the new postings, the inspectors determined that criticality safety will be enhanced by the further elimination of human factors considerations which contributed to the April 3, 2002, event.

The inspectors reviewed the licensee's operational philosophy to systematically reduce the number of administrative controls for criticality safety. The inspectors determined that efforts had been established through the systematic analysis associated with the Integrated Safety Assessment (ISA), and commitments to install engineered equipment in order to meet the new 10 CFR 70.61 performance requirements are well underway.

VIO 70-1257/0203-05

This violation concerned the failure to include the requirements the Criticality Safety Analysis and their associated Criticality Safety Specifications (CSS) in a Standard Operating Procedure. The licensee identified the area of requirements flow down as a contributory cause of the violation.

The inspectors determined that the licensee has committed to involvement of operators in the development of standard operating procedures. Based on discussions with NCS component staff, the inspectors determined that changes to procedures are physically verified as being able to be practically implemented. The inspectors noted that licensee management expects procedure walk downs for major changes or equipment modifications prior to procedure sign-off to ensure requirements are clear and can be easily and consistently performed. In the case of infrequently used procedures, the inspectors noted that licensee management expects the performance of pre-job briefings every time the procedure is used.

The licensee performed a thorough self assessment which was conducted by a team of industry professionals with operating experience from five different plants in the U.S. and France with subject matter expertise in nuclear facility operation and management, configuration control, regulatory affairs, human behavior, root cause analysis, plant engineering and design. The inspectors reviewed the self assessment and found the document to be very candid and thorough. As a result of the self assessment, commitments were made to improve the root cause analysis process. The licensee expanded the root cause analysis process to include the cultural and management issues, expand the scope of the program beyond direct causes, institute management followup

processes and provide root cause analysis training. The licensee had completed the root cause training. The inspectors reviewed the training program provided by an outside contractor and the list of personnel trained. The training program was found to be complete and thorough. The licensee plans for periodic update training in root cause analysis.

The inspectors reviewed the licensee's corrective actions committed to in response to the April 2-3, 2002, loss of criticality control event. The corrective action plan contains some items that will be implemented over a longer period of time including up to May 1, 2005. The longer term corrective actions to be followed up on in future inspections include restructuring the standard operating procedure program, continue developing standard work instructions, implement an improved training program, make procedures more readily accessible to operators (terminals/paper copies/standard work instructions), continued training in root cause analysis and make control improvements in the configuration management system. The inspectors determined that the licensee's commitments as detailed in their letter to the NRC dated September 26, 2002, *Reply to a Notice of Violation*, were on schedule and that substantial progress had been made. This item will remain open until the corrective actions are completed.

1.3 Conclusion

The inspectors reviewed the licensee's corrective actions committed to in response to the April 2-3, 2002, loss of criticality control event. The licensee had developed an action plan and status report which contained the topical headings of 1) management and supervisory accountability, 2) worker training and qualification, 3) procedural work-arounds, 4) adequacy of root cause evaluations, 5) requirements flow-down, and 6) configuration management system adequacy. The corrective action plan contains some items that will be implemented over a longer period of time including up to May 1, 2005. The longer term corrective actions to be followed up on in future inspections include restructuring the standard operating procedure program, continued development of standard work instructions, implementation of an improved training program, making procedures more readily accessible to operators (terminals/paper copies/standard work instructions), continued training in root cause analysis and making control improvements in the configuration management system. The inspectors determined that the licensee's commitments as detailed in their letter to the NRC dated September 26, 2002, *Reply to a Notice of Violation*, were on schedule and that substantial progress had been made. This item will remain open until the corrective actions are completed.

The licensee had improved procedural controls through the use of digital pictures on some postings to clearly describe the type of containers approved for storage.

4 **Exit Meeting Summary**

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on December 5, 2002. The licensee did not identify any of the information discussed at the meeting as proprietary.

ATTACHMENT

PARTIAL LIST OF LICENSEE PERSONNEL CONTACTED

R. K. Burklin, Manager, Radiation Protection
R. E. Link, Site Manager
L. J. Maas, Manager, License and Compliance
C. D. Manning, Criticality Safety, Regulatory Compliance
D. W. Parker, Environmental, Health, Safety & Licensing
J. J. Payne, Manager, Chemical Operations

INSPECTION PROCEDURES USED

88020	Operational Safety Review
88035	Radioactive Waste Management
84850	Waste Generator Requirements
92701	Followup

OPEN, DISCUSSED AND CLOSED ITEMS

<u>Closed</u>	None
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<u>Opened</u>	None
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Discussed

70-1257/0203-01	VIO	Failure to maintain double contingency control for criticality safety
70-1257/0203-02	VIO	Failure to maintain configuration control for criticality safety
70-1257/0203-03	VIO	Operator failure to follow procedure requiring drum inspection and management failure to provide adequate supervision
70-1257/0203-04	VIO	Failure to identify necessary criticality safety controls in the CSA and CSS
70-1257/0203-05	VIO	Failure to include CSA and CSS requirements in the SOP

LIST OF ACRONYMS USED

<	less than
ADAMS	agencywide documents access and management systems
ADU	ammonium diuranate
ARF	ammonia recovery facility
CFR	Code of Federal Regulations
CSA	criticality safety analysis
CuFt	cubic feet
DCF	dry conversion facility
ELO	engineering laboratory operations
IFI	inspection follow up item
LUR	lagoon uranium recovery
MDA	minimum detectable activity
MERF	modular extraction/recovery facility
MOU	memorandum of understanding
NCS	Nuclear Criticality Safety
NMSS	Nuclear Material Safety and Safeguards
NRC	Nuclear Regulatory Commission
PDR	public document room
SNM	special nuclear material
SPF	solids processing facility
SWUR	solid waste uranium recovery
UO ₂	uranium dioxide
UF ₆	uranium hexafluoride
UO ₂	uranium dioxide
URI	unresolved item
VIO	violation