

ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 70-1257
License No.: SNM-1227
Report No.: 70-1257/96-04
Licensee: Siemens Power Corporation
Facility: Siemens Power Corporation
Location: Richland, Washington
Dates: October 21-25, 1996
Inspector: C. A. Hooker, Senior Fuel Facility Inspector
Approved By: Frank A. Wenslawski, Chief
Materials Branch

Attachment: Supplemental Inspection Information

EXECUTIVE SUMMARY

Siemens Power Corporation
NRC Inspection Report 70-1257/96-04

This routine announced inspection included aspects of emergency preparedness, fire protection, followup on licensee events, and followup on an open item from a previous inspection.

Emergency Preparedness

- The licensee's Emergency Plan (EP) and implementing emergency procedures provided sufficient guidance for responding to plant emergencies, and the emergency organization appeared adequate for responding to emergencies (Section 1.1).
- Emergency response personnel were adequately trained and appeared knowledgeable of emergency response procedures and equipment (Section 1.2).
- Emergency exercises and drills appeared to adequately exercise the licensee's emergency response organization (Section 1.4).
- The licensee did not maintain an effective tracking system for deficiencies identified during fire evacuation drills (Section 1.4).
- Overall, the licensee's emergency response facilities and equipment were maintained in a state of operational readiness; however, one violation was identified for failure to perform semiannual calibration checks on direct-reading pocket dosimeters (Section 1.4).

Fire Protection

- The licensee was adequately maintaining its fire safety equipment and fire protection systems, and housekeeping was generally good throughout the site (Section 2.2).
- The licensee maintained an adequate fire safety training program (Sections 1.2 and 2.3).
- Onsite events were adequately evaluated for cause and corrective actions (Section 2.3).

Followup - Licensee Event Report (Operations)

- One non-cited violation (related to a uranium powder spill) was identified for failure to follow operating procedures (Section 3.a).

Report Details

Summary of Plant Status

The plant was operating both of its wet chemical conversion lines and the current dry conversion process. Fuel pellet manufacturing, fuel rod fabrication, and fuel bundle assembly operations were also in progress.

1 Emergency Preparedness

1.1 Emergency Plan and Implementing Procedures

a. Inspection Scope (88050)

The inspector reviewed and discussed revisions to the licensee's EP and implementing procedures, and organization and staffing with licensee personnel to determine if the licensee's emergency program was current with site conditions and being maintained in a state of operational readiness. Specific 1996 revisions reviewed included:

- Substantive changes to Part I (EP) and Part II (EP implementing procedures) submitted to NRC by letter dated January 23, 1996 (Revisions dated July 1995).
- New implementing procedures (submitted to NRC by letter dated May 1, 1996) Nos. 8.2, "Plant Evacuation Procedures - Onsite"; 8.3, "Plant Evacuation Procedures - Offsite"; 8.4, "Plant Evacuation Procedures - Individual Buildings"; and 8.5 "Emergency Equipment List."
- Part II, "Quick Reference Section," Revision 28, dated October 7, 1997.

b. Observations and Findings

Although the licensee's quick reference (Part II), implementing procedures (Part III), and letters of agreement (Part IV) are not considered as part of the EP specified in Section 8, Part I of the license, the licensee provides these Parts and revisions to the NRC as part of the EP manual. Revisions to the EP dated July 1995 involved inclusion of facility additions, postulated fire accident at the new uranium hexafluoride (UF₆) cylinder storage area, notification to other offsite agencies or nearby facilities, position descriptions for some new plant emergency response management team positions, activation of emergency organizations and, minor changes to the EP training program. Revised and new implementing procedures were consistent with the revisions in the EP. The licensee's emergency response organization, emergency response personnel responsibilities, and staffing were consistent with that described in the licensee's EP. The EP and implementing procedures provided adequate guidance on classification and mitigation of the

consequences of emergencies, assessment for any potential releases of radioactive materials and hazardous chemicals, personnel accountability, site evacuation, and internal and off-site notification of emergencies.

In early 1997, the licensee will be revising its EP and Pre-Emergency Plan (discussed in Section 2 below) to reflect the new Dry Conversion Facility (DCF) and other planned facility additions.

c. Conclusions

The licensee's EP and implementing emergency procedures provided sufficient guidance for responding to plant emergencies, and the emergency organization appeared adequate for responding to emergencies.

1.2 Emergency Preparedness Training

a. Inspection Scope (88050)

The inspector reviewed training records and interviewed selected emergency response supervisory personnel and technicians to evaluate their awareness of emergency procedures. The inspector also attended a training session for shift supervisors and lead technicians who may act as the Plant Emergency Director during off-shift hours.

b. Observations and Findings

The inspector noted that training records were up-to-date and training lesson plans for the Plant Emergency Response Management Team, Plant Emergency Director, and the Plant Emergency Response Team (PERT) adequately covered subject matter relative to their respective assignments. As part of emergency response capabilities, the licensee also maintains a state certified confined space and rope rescue team. PERT team training covering the use of self-contained breathing apparatuses consisted of practical exercises in a smoke trailer located at the Richland airport. Of 54 PERT team members, 48 attended this training. Training attendance related to emergency response in the areas of industrial hygiene, radiological response procedures, hazardous materials decontamination and spill control procedures, first aid/mass casualties procedures, and fire fighting also showed good attendance. Regarding fire fighting capabilities, the licensee's training primarily involves the use fire extinguishers that includes extinguishing a 160 ft² liquid fire. Other than incipient fire, the licensee relies on the Richland Fire Department for fire fighting capabilities (discussed in Section 2 below).

The licensee maintained a current roster of qualified Plant Emergency Response Management Team and PERTs in the Incident Commander's office and the Emergency Operations Center. Personnel interviewed appeared knowledgeable of

their responsibilities and procedures for their respective assignment in the emergency organization

c. Conclusion

Emergency response personnel were adequately trained and appeared knowledgeable of emergency response procedures and equipment.

1.3 Offsite Support Agencies

a. Inspection Scope (88050)

The inspector evaluated the licensee's involvement with offsite support agencies as described in the EP.

b. Observations and Findings

The licensee's emergency plan contained current agreement letters with offsite agencies for response or assistance during emergency events. The licensee had formally notified local, county, state, and federal support agencies of its annual one day training and site familiarization tour that occurred on September 26, 1996. Attendance was good from offsite support agencies during this training and training conducted in 1995. Quarterly, the licensee contacted its offsite support agencies to verify telephone numbers and points of contact.

c. Conclusions

The licensee maintained adequate support from offsite agencies for responding or assisting during an emergency event.

1.4 Drills, Exercises, and Audits

a. Inspection Scope (88050)

Records of licensee drills, exercises, and audits were reviewed and discussed with cognizant licensee personnel.

b. Observations and Findings

In accordance with the licensee's EP, one major exercise or table-top exercise is conducted by the site emergency response organization each year. Every two years a major field exercise consisting of an accident scenario, activation of the emergency response organization, and activation of emergency response facilities is conducted. The biennial field exercise "Jeopardy" with NRC and other support agencies participating was conducted on October 25, 1995. Although not specifically defined, the licensee's upcoming 1996 exercise will include evacuation

of personnel to its offsite alternate Emergency Operations Center and staging areas. This was a recommendation that was generated from exercise "Jeopardy." The inspector noted that other recommendations from this exercise had been addressed either by new implementing procedures or were being planned for exercising during the upcoming exercise.

One of the deficiencies identified during exercise "Jeopardy" was that, after declaration of an Alert, offsite notifications as delineated in implementing Procedure No. 1.1, "Classifying an Emergency," took more than 15 minutes to complete. NRC Regulatory Guide 3.67 provides notification guidance that an Alert or a Site Area Emergency classified event be promptly reported to offsite agencies "normally within 15 minutes" of declaration of such an event. The inspector noted that the licensee had revised its implementing procedure (No. 1.1) to ensure that notification of offsite agencies, including the NRC, be completed within 1 hour of declaration of an emergency. 10 CFR 70.22(i)(1)(viii) requires that the NRC be notified within 1 hour after the licensee declares an emergency. The increase in notification time was discussed with the licensee. The inspector was informed that the intent is to make notifications as promptly as possible, but when relative to the number of agencies (12 agencies) to notify, the 15 minutes may not be practical. During the upcoming exercise, the licensee will be performing a detailed evaluation of the notification time.

Periodic drills include any of the following: a plant evacuation drill (criticality and fire), a mass casualty drill, a fire extinguisher drill, or a self-contained breathing apparatus rescue drill. Criticality evacuation drills were noted to be performed semiannually. During 1996, the licensee conducted fire evacuation drills from all site buildings, including those not normally occupied. Critiques of fire and criticality evacuation drills were utilized to identify and correct deficiencies. Related to building fire evacuation drills, the inspector noted that the licensee had not established an effective system to track corrective actions for identified deficiencies as done with annual exercises. As an example, several smoke doors failed to close (auto closure on fire alarm activation) in Building 8 during an evacuation drill on June 11, 1996. Early in the inspection, cognizant licensee personnel were unable to provide the cause of this failure or whether actions had been taken to correct the problem. Subsequently, the licensee promptly determined the cause and fixed the matter. The lack of an effective tracking system was acknowledged by the licensee.

Monthly audits of emergency equipment and supplies were timely. The licensee's annual internal audit was conducted on October 2-4, 1996, by a member from Quality Engineering and a member from the safety department who does not have direct responsibility for implementing the emergency response program. The audit evaluated performance relative to the requirements of the EP and procedures, with special emphasis on training, emergency equipment, and memorandums of understanding from offsite agencies. There were no audit findings that required a

written response and no significant weaknesses were identified. Comments from the audit were being addressed by the licensee.

c. Conclusions

Emergency exercises and drills were consistent with the commitments in the licensee's EP and appeared to adequately exercised the licensee's emergency response organization. Although actions for recommendations and deficiencies identified in annual exercises were effectively tracked, such a system was not in place for identified deficiencies during fire evacuation drills.

1.5 Emergency Equipment and Facilities

a. Inspection Scope (83050)

The inspector toured the licensee's facilities to examine selected emergency response equipment maintained in emergency repositories and evaluated the licensee's posting of evacuation routes.

b. Observations and Findings

The inspector noted that emergency equipment repositories contained the quantities and equipment identified in the licensee's EP and implementing procedures. Cabinets containing emergency equipment were clearly identifiable, contents were orderly, and appeared to be well maintained. Survey meters examined were currently calibrated and operational, and self-contained breathing apparatus air tanks were full. However, the inspector noted that all of the self reading pocket dosimeters maintained in the emergency repositories were overdue for a calibration. Sets of direct-reading pocket dosimeters (DRPDs) with three different ranges are maintained in two of the licensee's emergency repositories, one set of 12 DRPDs in office Building No. 4 and two sets in the security building. The inspector noted that one set of DRPDs in the security building and the one in Building No. 4 repository showed a calibration date of September 18, 1995, with a due date of March 10, 1995, and the second set of DRPDs in the security building showed a calibration date of July 25, 1995, and a due date of July 25, 1996.

Calibration of the DRPDs are performed by an offsite vendor. According to the licensee, the onsite upkeep of the DRPDs was previously assigned to a member of the safety department who is no longer employed by the licensee. When the responsibilities of the former employee were assigned to current staff, the upkeep of the DRPDs was not fully defined, and therefore the calibrations were missed. Regarding the 6-month and 12-month calibration due dates, the licensee stated that it was something the vendor had inadvertently done without the licensee's recognition.

Safety Condition S-1 of SNM License 1227 authorizes the use of license materials in accordance with the statements, representations, and conditions contained in Part I of the licensee's application dated July 1987 and revisions thereto.

Safety Condition S-6 of SNM License 1227 requires the licensee to maintain and execute the response measures described in the EP EMF-32, transmitted by letter dated May 20, 1993, and revisions thereto; or, as provided by the licensee consistent with 10 CFR 70.32(i).

Section 3.2.4.1, "Radiation Safety Instruments and Equipment," Part I of the license requires all radiation detection and measurement instruments be calibrated at least semiannually or tagged out. Table 1-3.2, Part I of the license lists instruments used which includes direct-reading dosimeters.

Section 5.5.1.3, "Monitoring," of the EP states, in part, that pencil dosimeters are issued to emergency workers as they are deployed into a potentially high radiological exposure areas.

Although no emergency event occurred that required the issuance of the DRPDs, the failure to perform semiannual calibration checks of the DRPDs was identified as a violation of Safety Condition S-1 (70-1257/9504-01). The inspector also considered that there was ample opportunity for the licensee to identify the problem through its monthly inspection program and recent annual audit. Relative to the violation, the licensee took immediate action to have the DRPDs calibrated and temporarily replaced each set of dosimeters with calibrated electronic alarming dosimeters until the DRPDs could be calibrated. The licensee also placed the DRPDs on its computerized preventative maintenance system to assure future calibrations were timely. The licensee also made arrangements ensure that the monthly inspections included more detailed inspections of instrument calibration tags.

During facility tours, the inspector noted that emergency exit doors were adequately posted and evacuation routes were adequately defined.

c. Conclusions

With the exception of one violation involving the failure to calibrate DRPDs, the licensee maintained a good inventory of well maintained emergency response equipment and supplies that were in a state of operational readiness. Evacuation routes and emergency exits were clearly posted. The licensee corrected the violation and its cause during the course of the inspection.

2 Fire Protection

2.1 Procedures and Pre-Fire Plan

a. Inspection Scope (88055)

The inspector reviewed selected licensee documents and discussed the licensee's fire protection program with licensee personnel.

b. Observations and Findings

Procedure ANF-P65,533, dated May 7, 1990, Chapter 1, "Industrial Safety Standards," of the licensee's Safety Manual (EMF-30), although not detailed, provides a basic description, standards and guides for the licensee's fire protection program and procedures for flammable and combustible liquids storage and handling, testing of selected plant fire safety systems, fire protection equipment and service. Although the information in this 6-year old procedure appeared current, the inspector discussed the prospects of the licensee updating the procedure to include improvements made in the program during the past 2 years. This matter was acknowledged by the licensee.

The licensee's pre-fire plan titled Pre-Emergency Plan (PEP) adequately describes the fire protection systems, hazardous materials, water exclusion areas associated with nuclear safety moderation control for materials incompatible with water, and hazards from special equipment for each building in use. The licensee had plans to update the PEP in early 1997 to include the new dry conversion facility (under construction) and other recent plant additions.

The licensee continues to maintain a good working relationship with the Richland Fire Department (RFD), which has the primary responsibility for fighting fires at the licensee's facility. The licensee provides the RFD several copies of the PEP. The RFD generally visits the licensee's facility annually for familiarization.

c. Conclusions

The inspector determined that the licensee's procedures provide the basic elements of an adequate fire protection program.

2.2 Training, Drills, and Events

a. Inspection Scope (88055)

In addition to the training and fire evacuation drills discussed in Section 1.4 above, the inspector examined the licensee's posting of fire safety instructions during facility tours. The licensee's actions relative to recent fire safety events at other

fuel cycle facilities and onsite events were reviewed and discussed with the licensee.

b. Observations and Findings

In addition to fire protection training of plant personnel, the inspector observed that fire protection instructions were conveniently posted throughout the licensee's facilities. These instructions included general fire safety practices in the work area, what to do in case of fire, emergency telephone numbers, and the proper use of fire extinguishers.

Related to a fire from incinerator operations at the Nuclear Fuels Services, Erwin, Tennessee facility, on June 24, 1996, the licensee completed a detailed documented review of its incinerator operations to preclude such an event at Siemens. Although the incinerators are of different design, the licensee identified six action items to strengthen procedures and practices. The inspector noted by internal letter dated September 24, 1996, the licensee documented the completion and actions taken for all six items.

During the past year, the licensee had experienced one fire related event that occurred on October 17, 1996. The licensee's investigation was completed October 24, 1996. The event involved a new heat traced 2-inch polyvinyl chloride clean liquid waste line installed to the new DCF. The fire involved approximately 1 foot of the pipe, outside of the DCF, that was quickly extinguished by the licensee. The remaining 200 feet of the pipe was damaged from excessive heat from the heat trace. Since the drain line had not been used, no radioactive materials were involved and there was no damage other than the effected drain line. The licensee determined that the heat sensor had not been installed and recent cold weather activated the heat trace controller which resulted in overheating the pipe. Relative to this event, the licensee's actions included plans to use a self-limiting heat trace on all future plastic pipe installations and review current installations for proper installation. Additionally, plant engineering was to develop guidelines for future heat trace installations. The inspector had no further questions related to this matter.

c. Conclusions

The licensee maintained an adequate fire safety training program. Onsite events were adequately evaluated for cause and corrective actions.

2.3 Equipment Testing and Maintenance

a. Inspection Scope (88055)

Records of tests and inspections of fire protection systems were reviewed and discussed with licensee personnel. The inspector also toured selected areas of the

plant with licensee personnel to observe the status of fire protection equipment and housekeeping practices.

b. Observations and Findings

The inspector noted that maintenance and testing of sprinkler systems, detection systems (smoke detectors and heat detectors), manual pull stations, fire bells, and fire/smoke doors, and portable fire extinguishers were consistent with licensee procedures and/or industry standards.

The inspector noted that the RFD conducted a test on May 2, 1996, to determine the available water flow for the new DCF. The test results indicated an adequate water flow for the fire safety needs at this facility.

Visual examinations of the fire detection and suppression systems during facility tours did not reveal any maintenance concerns. Fire extinguishers were conveniently located throughout the site. Housekeeping was generally good throughout the licensee's facilities. Areas that needed minor attention were addressed by the licensee.

c. Conclusions

The licensee was adequately maintaining its fire safety equipment and fire protection systems. Housekeeping was generally good throughout the site.

2.4 Audits

a. Inspection Scope (88055)

The inspector reviewed an American Nuclear Insurers (ANI) Fire/All Risk property insurance inspection conducted April 9-11, 1996, a RFD annual fire safety survey conducted on March 26, 1996, and reports of monthly inspections conducted by members of the licensee's Health and Safety Council (H&SC).

b. Observations and Findings

The ANI inspection did not identify any major safety concerns, however, one recommendation and five suggestions that were provided to the licensee. The inspector noted that these matters had been addressed by the licensee. The RFD fire safety survey did not identify any safety concerns. The H&SC continues to conduct monthly safety walk-down inspections that focused on general fire safety, other potential industrial safety hazards, and general housekeeping practices. These reports indicated that the licensee's inspections were effective in identifying and correcting deficiencies germane to the focus of the inspections. No significant safety concerns had been identified through the H&SC inspections.

c. Conclusions

The lack of identification of any significant safety concerns appeared indicative of the licensee's maintenance of an adequate fire safety program.

3 **Followup**

a. Licensee Events (90712 and 88020)

(Closed) Licensee Event Report (LER) No. 30998: Uranium powder spill due to failure to follow operating procedures. At approximately 2:20 a.m. on September 12, 1996, after adding lubricants, an operator was taping a lid to a 45-gallon poisoned uranium powder drum in preparation for tumbling. Because of difficulties in getting a roll of tape around the drum in a hood, the operator moved the drum from the hood onto a transfer cart to complete the taping. (Note: drum lids are taped prior to tumbling operations to preclude powder seepage from the drum lid.) When the drum was moved to the transfer cart, the operator did not lower a restraining bar on the cart as required by operating procedure P66,333, "Powder Storage (13A) and Powder Transport." The operator then loosened the retaining ring on the drum lid, slid the ring down the drum, to complete the taping. The respective operating procedure P66,396, "Powder Additives for Press Production Use," requires that drums be taped and the lid retaining ring be secured before removing the drum from the hood. Criticality Safety Specification P67,241, "45-Gallon Powder Drums With Neutron Absorber Inserts," also requires that drum lids be secured in place except when in a hood. The operator moved the transfer cart, before securing the retaining ring on the drum lid in order to close the hood door to prevent any potential airborne releases to the room. While moving the transfer cart, the drum rolled off the cart onto the floor, spilling 16.5 kilograms of low enriched uranium onto the floor.

The licensee promptly evaluated the powder spill and reported the matter to NRC in accordance with the requirements of Bulletin 91-01 as the uranium powder spill from its poisoned storage drum onto the floor represented a loss of one of the two safety contingencies (double contingency principle) for moderation control. The remaining contingency, intrusion of a moderating material, remained fully intact as the spill occurred in a moderation controlled room (no water sources) and the powder had been previously certified dry by two independent laboratory analyses. The amount of powder spilled was less than 30 percent of a critical mass at the known enrichment. The powder spill did not result in any injuries, component damage, personnel contaminations, or offsite release of radioactive material.

Immediate corrective actions taken by the licensee were to review the event and applicable procedural requirements with each operating crew and initiate an Incident Investigation Board to review the matter and perform a "TapRoot™" root cause analysis. The licensee's investigation identified that the operator removed the drum from the hood to perform the taping because of the difficulty of performing this task

in the hood, and the restraining bar was not secured on the cart due to human error (operator forgot). Long term corrective actions to prevent recurrence included (1) modification of hoods to allow better access for taping and securing lids, (2) installing limit switches on the transfer carts so that they cannot be operated with the restraining bar unsecured, and (3) instructing plant personnel of the licensee's policy against short-cuts and the necessity of contacting supervision when tasks cannot be performed exactly as required.

During facility tours, the inspector observed powder drum operations and did not observe any deviations from operating procedures or criticality safety specifications. The licensee had initiated actions to place limit switches on the transfer carts and engineering was evaluating modifications to the powder hoods to improve handling operations for powder drums.

The inspector concluded that the licensee's corrective actions were appropriate. The failure to follow operating procedures was a violation of Safety Condition S-1 of the license. Since this matter was identified by the licensee and is being corrected by the licensee, this violation is being treated as a non-cited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV 70-1257/9604-02).

b. Open Item Reviewed (92701)

(Open) Inspector Followup Item 70-1257/9601-01: Deficiencies in the licensee's maintenance work permit (MWP) and radiation job permit process (RJP). NRC Inspection Report 70-1257/96-03 documents a previous review of this matter. During this inspection (70-1257/96-04), the inspector noted that maintenance engineering had again revised the MWP procedure (EMF-858, No. 1.27, Revision 4) on September 19, 1996, to further refine the process. However, the safety department had not completed a new procedure being developed to implement the RJP portion of the MWP procedure. This matter will remain open until the effectiveness of the licensee's implementation of the new MWP and RJP procedures can be evaluated.

4 **Exit Meeting Summary**

The inspector presented the inspection results to members of the licensee management at the conclusion of the inspection on October 25, 1996. The licensee acknowledged the findings presented.

Although proprietary information was reviewed during this inspection, such information is not knowingly described in this report.

ATTACHMENT

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

B. F. Bentley, Manager, Plant Operations
J. B. Edgar, Senior Engineer, Licensing
E. L. Foster, Supervisor, Radiological Safety
J. W. Helton, Manager, Plant Engineering
E. J. Hough, Technical Training Specialist
L. J. Maas, Manager, Regulatory Compliance
C. D. Manning, Acting Manager, Safety
T. C. Probasco, Manager, Safety
R. E. Vaughan, Manager, Safety, Security and Licensing
G. N. Ward, Manager, Manufacturing Engineering

State of Washington

L. Waynehouse, Division of Radiation Protection, Department of Health

INSPECTION PROCEDURES USED

IP 88050: Emergency Preparedness
IP 88055: Fire Protection
IP 90712: In-Office Review of Licensee Events
IP 88020: Operations Review
IP 92701: Followup

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

70-1257/9604-01	VIO	Failure to calibrate direct reading pocket dosimeters
70-1257/9604-02	NCV	Failure to follow operating procedures

Closed

70-1257/30998	LER	NRC Bulletin 91-01 Report - Uranium powder spill
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Examined and Left Open

70-1257/9601-01		Deficiencies in the licensee's maintenance work permit process.
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LIST OF ACRONYMS USED

ANI	American Nuclear Insurers
DCF	Dry Conversion Facility
DRPD	direct-reading pocket dosimeter
EP	Emergency Plan
H&SC	Health and Safety Council
LER	licensee event report
MWP	Maintenance Work Permit
NCV	non-cited violation
PEP	Pre-Emergency Plan
PERT	Plant Emergency Response Team
RFD	Richland Fire Department
RJP	radiation job permit process