

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-341/92008(DRSS)

Docket No. 50-341

License No. NPF-43

Licensee: Detroit Edison Company
6400 North Dixie Highway
Newport, MI 48166

Facility Name: Fermi Nuclear Power Plant, Unit 2

Inspection At: Fermi Site, Newport, Michigan

Inspection Conducted: April 6-10, 1992

Inspectors: A. C. Januska
A. C. Januska

4/29/92
Date

N. Shah
N. Shah

4/29/92
Date

Approved By: M. C. Schumacher, Chief
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Radiological Controls and
Chemistry Section

4/29/92
Date

Inspection Summary

Inspection on April 6-10, 1992 (Report No. 50-341/92008(DRSS))

Areas Inspected: Routine unannounced inspection of the solid, liquid and gaseous radioactive waste management programs (IPs 84750 and 86750) with emphasis on interim radwaste storage. In addition, the circumstances surrounding a radioactive material shipment, radioactive contamination found in the Fermi Unit 1 cooling water channel and chemical waste pond, NRC Information Notice 91-84 and qualifications of contract radiation protection technicians (IP 83750) were also reviewed.

Results: No violations or deviations were identified. A new radwaste organization appears to be conducting solid radwaste processing and shipping activities in accordance with requirements and no problems were observed with liquid or gaseous releases. Tours of the plant indicated housekeeping was reasonably good and no problems were identified in the use of the offsite storage facility. Licensee Contract Radiation Protection Technicians appear to satisfy the requirements of ANSI N18.1-1971.

DETAILS

1. Persons Contacted

W. S. Orser, Senior Vice President
D. R. Gipson, Assistant Vice President
J. Pendergast, Compliance Engineer
J. M. Joy, Sr., Compliance Engineer
D. Stone, Supervisor PQA
T. Bradish, Supervisor QPA
T. Vandermeij, Radiological Engineer
R. B. Stafford, General Director Nuclear Assurance
R. A. Newkirk, General Director Regulatory Affairs
A. C. Settles, Director Nuclear Licensing
F. Svetkovic, Superintendent Radwaste
S. G. Catola, Vice-President Nuclear Engineering
R. R. Eberhardt, Supt. Radiological Protection
J. Mulvehill, Supv. Radiological Environmental Monitoring
E. F. Kokosky, General Supv. RP operations
L. Goodman, Director Nuclear Quality Assurance
J. Heins, Radiological Assessor
R. Simpson, Supervisor Radwaste
R. Delong, Radiation Protection Manager

K. Riemer, NRC Resident Inspector

The above personnel were present at the exit meeting on April 10, 1992.

The inspector also interviewed other licensee and contractor personnel.

2. Licensee Action on Previous Inspection Findings

(Closed Open item (341/91019-01): Analyze a liquid sample and report the results to Region III. Results of sample comparisons are in Table 1; with the comparison criteria given in Attachment 1. Agreements resulted for tritium and strontium 89 with conservative disagreements for gross beta and iron 55. No comparison was made for strontium 90 due to poor counting statistics. Because of the poor counting statistics and the disagreements, the inspectors will have a spiked liquid sample supplied to the licensee to be analyzed and the results reported to Region II for comparison. (Open Item 341/92008-01)

(Closed) Open Item (341/91013-02): Followup on the effectiveness of corrective actions taken for eating, drinking and smoking in the Radiological Controlled Area (RCA). Although one piece of candy and a cigarette butt were found by NRC inspectors in early March 1992, the instances of these findings are becoming less and the effort spent following up on this item appears to be satisfactory. Although this item is considered closed, it will be followed routinely during subsequent inspections.

(Closed) Open Item (341/90018-02): Radiological assessor's ALARA concerns will be reviewed during an audit conducted by Quality Assurance (QA). The inspector examined the audit. In addressing the assessor's concerns the

licensee has provided training to both Nuclear Engineering and Technical Services personnel and has conducted plant walk downs to demonstrate ALARA practices. The Training provided was very comprehensive and a practical ALARA design problem given as part of the course had good ALARA applications and was challenging.

3. Organization and Management Controls (IPs 84750 and 86750)

In response to a 1991 QA audit (section 4), radwaste functions previously performed by other plant groups were consolidated into a new organization with responsibility over decon, radwaste operations, shipping activities and the Onsite Storage Facility (OSSF). The new radwaste group is headed by a superintendent who reports directly to the plant manager.

Plant quality assurance and control activities are performed under the Director, Nuclear Quality Assurance who reports through the General Director Nuclear Assurance to the Senior Vice President. Plant audits are usually performed using onsite personnel, but additional support from the Joint Utility Technical Assistance (JUTA) program is available if needed. All audits are routinely reviewed by the Senior Vice President.

No violations or deviations were identified.

4. Audits and Appraisals (IP 83750)

In addition to those required by technical specifications, formal audits may be requested by plant management or the Nuclear Safety Review Group (NSRG) based on Deviation Event Reports (DER), safety reviews or plant performance. Audit concerns consist of findings and observations that must be reviewed in a succeeding audit. Findings are documented as DERs requiring QA investigation and response in 180 days with final resolution reviewed by the plant manager. Observations are documented in the audit report and following QA review, closed in subsequent audits.

Recent audits of the radwaste management and environmental programs were reviewed, found to be thorough and contained substantive findings. Each audit received management review and corrective actions (section 3) appeared designed to prevent recurrence.

No violations or deviations were identified.

5. Training and Qualifications (IP 86750 and 83750)

Annual training in radioactive waste shipping regulations is provided via contracted courses for applicable personnel in the radwaste group and is open to those QA and Radiation Protection (RP) personnel able to attend. In addition, current copies of NRC, DOT and burial site regulations are maintained by the shipping coordinator.

Prior to being hired, resumes of contract radiation protection technicians (RPT) are reviewed by the General Supervisor RP Operations for compliance with ANSI N18.1-1971. Those resumes that pass this review are then certified as accurate by the contractor. Contract RPTs hired for additional coverage during outages are required to pass an exam on RP

fundamentals followed by successful completion of Nuclear General Employee and Fermi Site Specific Procedural training. If certified under the National Registry of Radiation Protection Technologists (NRRPT), the RP fundamentals test is not required.

A review of the RP fundamentals test identified it as being reasonably representative of theoretical and practical health physics fundamentals. Those contract technicians that had been hired appeared to meet ANSI N18.1-1971 requirements and had documented verification of their resumes.

No violations or deviations were identified.

6. Implementation of the Solid Radioactive Waste Program (IP 86750)

a. Waste Generation and Processing

Primary waste streams at Fermi include Dry Active Waste (DAW) from various plant activities, contaminated oil from plant machinery and spent resin from the radwaste demineralizer, Reactor Water Cleanup (RWCU), spent fuel pool, and condensate demineralizer systems.

Spent resin is dewatered and stored in high integrity containers (HIC) using the Chem-Nuclear RDS-1000 system. Compactable DAW is sorted and compacted into 55 gallon drums and non-compactable DAW is maintained in 55 gallon drums or boxes until such time as they can be shipped for offsite processing (section 6b). Both resin and DAW are processed and stored in the OSSF.

A safety analysis for the OSSF was performed as part of the initial licensing for Fermi but subsequent analyses were needed to accommodate storage of contaminated oil in the OSSF and the installation of the RDS-1000 system. These analyses were reviewed by the inspectors and no problems were identified.

OSSF inventory comprises 16.1 m^3 of contaminated oil and approximately 377 m^3 of DAW and spent resin to date. At present generation rates and assuming no future waste reduction, the licensee expects no storage problems for 5 years. The facility has been operating for approximately 1.5 years; to date, 16.8% of available capacity is in use.

Approximately 2 years ago, a task force was created to review methods of reducing spent resin generated by the condensate demineralizers. Following the review the condensate demineralizer filter was replaced and a bouy feed system was installed resulting in less precoat erosion and longer run times. The bouy feed system pumps resin into the demineralizers on a timed basis filling voids in the existing precoat and reducing overall erosion. Additional initiatives include ongoing testing of different filter media as a means of extending resin life.

b. Waste Classification and Transportation

Since being denied access, no shipments to burial sites have occurred, although the stored waste is maintained "shippable". One shipment of 765 ft³ of DAW was made to Chem Nuclear at Channahon, Illinois for processing on June 27, 1991, following a successful appeal of the prohibition on burial of Michigan wastes. Following processing, it was expected that the shipment would be sent to Barnwell, South Carolina for final disposal. However, on August 24, 1991, a federal court reinstated the prohibition. Chem Nuclear attempted to return the now compacted shipment to Fermi to avoid exceeding a 180 day possession limit in Chem Nuclear's license from the State of Illinois. However, Fermi was prohibited by their license to accept return of the radwaste with the result that Chem Nuclear sought and was granted a 90 day license extension by the Illinois Department of Nuclear Safety (IDNS) to possess the waste. Currently, IDNS has permitted Chem Nuclear to retain the waste at Channahon until December 31, 1992. In the interim period, NRC is proceeding with rulemaking allowing reactor licensees to accept the return of their own waste.

A review of the shipping documentation for this shipment did not identify any problems. Although there have been no regular shipments to burial sites, Fermi does maintain an active shipping program in the event access is reinstated or a new burial site becomes available.

The status of this shipment will continue to be monitored by Region III (Open Item 50-341/92008-02).

No violations or deviations were identified.

7. Gaseous Radioactive Waste (IP 84750)

A review of the gaseous radwaste program including the 1991 Semiannual Radioactive Effluent Release Report identified no problems. The program continues to be implemented as described in Inspection Report 50-341/91006(DRSS). The station is a continuous release plant and the only batch releases were from venting and purging which are normally accounted for in the reactor ventilation system. The inspectors cautioned the licensee that if purges and vents are found to contribute to the continuous release they must be quantified and reported. The licensee acknowledged the inspectors' comments. No abnormal releases occurred during this period.

The inspectors examined the closure of unresolved item 341/91015-03 related to higher than normal flows in the offgas system. Licensee investigations determined that running the offgas system at higher than normal flows had no overall detrimental plant effect and succeeded in identifying the cause of the leakage. Following repairs, the unit returned to operation at less than design value. The licensee will continue to monitor the flow rate of this system. This item was closed in Inspection Report 341/91022(DRP).

No violations or deviations were identified

8. Liquid Radioactive Waste and Reactor Water Chemistry (IP 84750)

The inspectors examined the Liquid Radioactive Waste (radwaste) Program including discharge batch releases and the 1991 Semiannual Radiological Effluent Release Reports. Both waste oil and waste water were routinely released during this period. Waste oil consists primarily of turbine oil (98-99%) with the remainder from drip pans under equipment and small amounts squeezed from rags. Oil is processed through an Oil Decontamination Unit in 500 gallon batches and analyzed for radioactive content and overall quality. If clean and of good enough quality, the oil is reused, otherwise it is transferred to an uncontaminated oil tank, sealed and later sent to a Detroit Edison fossil plant for incineration. The inspectors noted that the lower limit of detectability and the statistical test used prior to release were adequate to ensure that no contaminated oil is being released.

Sources of waste water processed and released include sumps, condensate, filter demineralizers and the Chem Waste tank among others. Water which is scheduled for reuse is analyzed for quality and radioactive content then recycled or released. Selected liquid release packages, containing analytical results, were found to be complete. During 1991, 33 batch releases of liquid from holding tanks to the Circulating Water Decant Line occurred prior to July 26, 1991, however, none have occurred since. The licensee is striving to achieve zero liquid release.

The licensee changed the liquid radwaste monitor sensitivity used in pre release calculations to account for the limiting case when a release is entirely composed of chromium-51. In addition pure beta emitters are taken into account during pre release calculations. Both of the above methods were developed by a member of the Radiation Protection Group.

A selective review of analysis results for dose equivalent iodine-131, conductivity, ph, and chlorides, verified that sampling had been performed as required and that no technical specification limits had been exceeded.

No violations or deviations were identified.

9. Radioactive in Onsite Sediments

In response to questions by the Fermi 1 Review Committee, the licensee analyzed sediment and water from several onsite locations. Early samples of sediment from the Fermi 1 discharge channel outfall (onsite) showed low levels of short lived activation products manganese-54, cobalt-60 and zinc-65 in addition to longer lived potassium-40 and cesium-137. This presence of the shorter lived nuclides in the discharge from the long closed Fermi 1 prompted wider sampling of onsite water and sediments to discover a possible link to the currently operating Fermi 2. These samples confirmed the presence of the short lived nuclides in the Fermi 1 canal and also showed unexplained low levels of cobalt-60 in an onsite chemical pond used to receive pipe flush water prior to plant startup. There is no apparent outfall from this pond and no activity other than naturally occurring potassium-40 was seen in any of the water samples. All samples were analyzed to the environmental lower limit of detection specified in the plant technical specifications.

Site characteristic studies and 10 CFR part 50 Appendix I calculations in the Updated Final Safety Analysis Report (UFSAR) anticipate recirculation flow between the liquid waste discharge and the Fermi 2 general service water (GSW) intake which is located near Fermi 1. The licensee believes this recirculation is probably responsible for the contaminated sediment in the Fermi 1 channel citing as support that the backwash of the GSW traveling screen is directed to the Fermi 1 channel.

The licensee plans to continue the evaluation including sampling of sediment in the near field of the Fermi 2 discharge along the shoreline adjacent to the plant. These investigations will be reviewed in subsequent inspections (Open Item 50-341/92008-03).

No violations or deviations were identified.

10. Dose Assessment (IP 84750)

A selective review of effluent dose calculations performed since the previous inspection and a comparison calculation for both a gaseous and liquid release did not identify any problems. Although the Offsite Dose Calculation Manual (ODCM) primarily considers the gamma component of dose, the licensee has routinely calculated the beta dose contribution (Section 8) and included it in the final dose assessment.

No violations or deviations were identified.

11. Plant Tours

During several tours of the facility the inspectors did not identify any significant problems. The OSSF was reasonably maintained, however, additional lighting appeared warranted and minor housekeeping problems were noted. It was also noted that Radiation Work Permits (RWP) are difficult to read.

While these issues were discussed at the exit meeting (section 14), it was noted that the licensee had prior awareness of them and was already considering appropriate corrective actions.

In order to reduce radiological postings in areas of transient dose rates the licensee is currently rerouting piping for the RWCU sample panel drain line and expects completion prior to the 1992 refueling outage. This rerouting is a continuation of work previously described in inspection report 50-341/89014(DRSS) and will be reviewed in a future inspection.

No violations or deviations were identified.

12. NRC Information Notice 91-84

The inspectors examined the licensee's action on NRC Information Notice 91-84: "Problems with Criticality Alarm Components/Systems." DER No. 92-0054, issued in January, 1992, addressed an issue that was completed in DER 88-2039 for the same subject. At that time the system was brought into compliance with Reg. Guide 8.12 and 10 CFR 70.24. Routine surveillances are performed.

No violations or deviations were identified.

13. Open Items

Open items are matters which have been discussed with the licensee, will be reviewed further by the inspector and which involve some action on the part of the NRC, licensee or both. Open items disclosed during the inspection are discussed in sections 2, 6b and 9.

14. Exit Interview

The scope and findings of the inspection were reviewed with licensee representatives (Section 1) at the conclusion of the inspection on April 10, 1992. The licensee did not identify any documents as proprietary. The following matters were specifically discussed by the inspectors:

- a. Observations made during plant tours (section 11)
- b. Status of the Chem Nuclear shipment (section 5b)
- c. Contamination found in Fermi Unit 1 cooling water channel and chemical waste pond (section 9)

Attachments:

- 1. Table 1, Confirmatory Measurements
Program Results, 3rd Quarter 1991
- 2. Attachment 1, Criteria for
Comparing Analytical
Measurements

TABLE 1
 U.S. NUCLEAR REGULATORY COMMISSION
 REGION III
 FACILITY: FERMI 2
 FOR THE 3RD QUARTER OF 1991

SAMPLE	NUCLIDE	NRC VAL.	NRC ERR.	LIC.VAL.	LIC.ERR.	RATIO	RESOL.	RESULT
LIQ	GBETA	2.16E-05	1.00E-06	3.21E-05	0.00E+00	1.49	21.6	D
	H-3	1.13E-03	1.00E-05	1.06E-03	0.00E+00	0.94	113.0	A
	SR-89	5.00E-08	9.00E-09	2.90E-08	0.00E+00	0.58	5.6	A
	SR-90	3.00E-09	5.00E-09	8.00E-09	0.00E+00	2.67	0.6	N
	FE-55	9.23E-05	3.00E-07	1.40E-04	0.00E+00	1.52	307.7	D

A = AGREEMENT
 D = DISAGREEMENT
 N = NO COMPARISON
 * = CRITERIA RELAXED

ATTACHMENT 1

CRITERIA FOR COMPARING ANALYTICAL MEASUREMENTS

This attachment provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In these criteria, the judgment limits are variable in relation to the comparison of the NRC's value to its associated one sigma uncertainty. As that ratio, referred to in this program as "Resolution", increases, the acceptability of a licensee's measurement should be more selective. Conversely, poorer agreement should be considered acceptable as the resolution decreases. The values in the ratio criteria may be rounded to fewer significant figures reported by the NRC Reference Laboratory, unless such rounding will result in a narrowed category of acceptance.

<u>RESOLUTION</u>	<u>RATIO = LICENSEE VALUE/NRC REFERENCE VALUE</u>
	<u>Agreement</u>
<4	NO COMPARISON
4 - 7	0.5 - 2.0
8 - 15	0.6 - 1.66
16 - 50	0.75 - 1.33
51 - 200	0.80 - 1.25
200 -	0.85 - 1.18

Some discrepancies may result from the use of different equipment, techniques, and for some specific nuclides. These may be factored into the acceptance criteria and identified on the data sheet.