

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-341/86002(DRSS)

Docket No. 50-341

License No. NPF-33

Licensee: Detroit Edison Company
2000 Second Avenue
Detroit, MI 48226

Facility Name: Fermi 2

Inspection At: Fermi Site, Newport, MI

Inspection Conducted: January 13-17 and February 3, 1986

Inspector: *L. J. Hueter*
L. J. Hueter

2-12-86
Date

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

2-12-86
Date

Inspection Summary

Inspection on January 13-17 and February 3, 1986 (Report No. 50-341/86002(DRSS))

Areas Inspected: Routine, unannounced inspection of gaseous and liquid radioactive program including: effluent release records and reports of effluents; effluent control instrumentation; procedures for controlling releases; coolant chemistry and activity; gaseous effluent filtration, review of occurrences involving radwaste releases and equipment, and operability of liquid waste systems. The inspection involved 41 inspector-hours onsite by one NRC inspector.

Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

- ²F. Agosti, Vice President, Nuclear Operations
- ¹²R. Anderson, Supervisor, Radiological Engineering
 - S. Bartman, Acting General Supervisor, Chemistry
- ¹²J. Conen, Engineer, Licensing
- ¹²R. Eberhardt, Rad Chem Engineer
- ¹²E. Griffing, Assistant Manager, Regulation and Compliance
- ¹³G. Overbeck, Superintendent, Operations
- ¹D. Pendergast, Consultant, Management and Ongoing Development
- ²E. Preston, Operations Engineer
- ¹²F. Reimann, Radiological Assessor

- ¹M. Parker, NRC Resident Inspector

¹Attended the January 17, 1986, exit meeting.

²Telephone conversation February 3, 1986.

³Telephone conversation February 7, 1986.

The inspector also contacted other plant staff during this inspection.

2. Gaseous Effluents

The inspector reviewed selected licensee records relating to airborne radioactivity releases for the period March 1985 through December 1985. Licensee surveillance, analyses, and release quantification appeared to be in accordance with applicable station procedures and regulatory requirements given in Technical Specification Table 4.11.2.1.2-1. Two licensee identified and corrected exceptions involving surveillances are discussed below.

Initial criticality was attained for Unit 2 in June 1985. The unit has been in an outage since October 1985. A maximum power level of about 5% was attained for a short period during startup tests before the outage. No activity has been detectable in gaseous effluents other than trace quantities of natural occurring radon and its daughter products.

The licensee utilizes a Nuclear Data Standard Applications Software System (LRW GRW) to quantify and control (comparison of actual dose with Technical Specification dose criteria) gaseous releases from each pathway (stack) as well as from all pathways combined. Normally iodine and particulate data are updated weekly while noble gas data are updated monthly. Updating may be more frequent if needed as indicated by significant increase in monitor readings. The system also has provision for accounting for gross alpha, tritium and strontium 89 and 90.

Another Nuclear Data Standard Applications Software System (RRRGS) is used to generate the semiannual effluent report.

License Event Report (LER) 85-020-00, dated June 27, 1985, described failure to obtain required (Technical Specification Table 3.3.7.12-1) grab sample from the Reactor Building (RB) exhaust while the RB effluent monitor was inoperable for a 13 hour period beginning about 1300 on June 3, 1985. Earlier on June 3, control room indication of all effluent monitors was lost and a two hour surveillance schedule was established to verify monitor operability. This surveillance was not documented in the Nuclear Supervising Operator's log and the surveillance was not continued during succeeding shifts. The event occurred before initial criticality and no radioactivity was released. Licensee corrective measures included discussions with operators regarding the importance of communicating both orally and through log entries. This was reinforced by a memo placed in the required reading file and the LER was reviewed in the requalification program for licensed personnel.

On November 11, 1985, the licensee submitted to NRC, LER 85-070-00 regarding failure to comply with Technical Specification 4.11.2.8.3 requirements for 12 hour drywell grab samples when purging containment through other than the standby gas treatment system (SGTS). The surveillance requirement was exceeded by about 28 hours between October 11 and 13th while purging the drywell through the reactor building ventilation system. Chemistry technicians collected samples at required intervals but failed to recognize that the sampling pathway used had been isolated from the drywell and were therefore invalid. The cause of the problem was failure of chemistry technicians to follow prerequisites in Chemistry Procedure 78.000.69 to verify correct sampling system alignment. Licensee corrective measures included discussion with chemistry technicians and additional training regarding the importance of following all steps of procedures, including prerequisites. The applicable procedure was also revised to include a specific checkpoint to verify proper line up and flow.

Corrective actions specific to these licensee identified problems appeared satisfactory. Generic actions to reduce the frequency of personnel errors were discussed with licensee management following the inspection.

No violations or deviations were identified.

3. Liquid Effluents

The inspector reviewed selected licensee records relating to liquid radioactive releases for the period March 1985 through December 1985. Licensee surveillances, analyses, and release quantification appeared to be in accordance with applicable station procedures and regulatory requirements given in Technical Specification Table 4.11.1.1.1-1 with certain licensee identified and corrected exceptions discussed below.

Only low levels of activity of a few isotopes have been identified in reactor water to date, namely Co 58 and 60, Cr 51, Mn 54, I 131 and

tritium. The most significant of these have been Co 58 and tritium. Owing to processing, most liquids are recycled; the remainder is batch released for reasons such as excess plant volume and chemical content (including organic content). In general, no identifiable activity has been detected in releases to date. The licensee has established a goal of zero liquid discharge. Currently, about 95% of processed liquids are recycled.

The licensee utilizes Nuclear Data software systems (like that used for gaseous releases) to quantify and control liquid releases on a batch basis and to generate the semiannual liquid effluent reports.

The LER-85-007-00, dated May 24, 1985, described failure on two occasions between April 23 and 25, 1985, to obtain required (Technical Specification 3.3.7.11.b) eight hour grab samples. These samples were required while discharging radwaste sample tanks via the circulating water reservoir decant line with the decant line radiation monitor inoperable. The plant had not reached initial criticality and no radioactivity was expected and samples taken confirmed this. Further, the radwaste monitor on the radwaste line (before dilution) from the radwaste sample tanks was operating in both cases). The cause of the problem in one case was failure to recognize the requirement to sample due to a misunderstanding by the control room operator concerning the applicability of the technical specification to the decant line monitor. As a corrective measure, a memo addressing the event and the need to consult technical specifications directly was made required reading for licensed operators. In the second case, the chemistry technician was late in obtaining the sample owing to unforeseen time delays. As a corrective measure, chemistry personnel were required to read a memo describing the event and its causes. Also, a procedure has been written and implemented which addressed technical specification surveillances and includes precautions concerning the importance of time intervals associated with technical specification sampling requirements.

LER-85-080-00, dated December 31, 1985, (updated January 17, 1986) describes a similar failure to obtain required eight hour grab samples while discharging two radwaste sample tanks on November 27 and 28 with the decant line monitor inoperable (not turned on). The non-licensed operator (NPP0) failed to turn on the sample pump that provides flow to the decant line monitor because neither he nor the Nuclear Supervising Operator (NSO) used Procedure SOP 23.626 during system line up. It was mistakenly believed that the absence of a low flow alarm for the monitor was an indication that the monitor was in operation. The NSO and his supervisor, the Nuclear Assistant Shift Supervisor (NASS) were counseled and issued a written record of an oral reprimand regarding their failure to assure that system lineup was performed using the SOP. A standing order was written (and is to remain in effect until appropriate procedure revisions can be made) which requires double verification (one by a licensed operator) of operability of effluent monitors before a release is initiated. A modification is being processed to change the alarm logic to enable the low flow alarm when the decant pump switch (rather

than the sample pump switch) is in the ON position. This will alert the control room of low sample flow to the radiation monitor whenever the decant pumps are running (decant pump switch ON), regardless of the status of the sample pump switch.

Samples taken from both tanks before the releases were initiated identified no detectable activity. Further, the liquid radwaste effluent line radiation monitor, with capability to automatically terminate a release from the waste sample tanks whenever the setpoint limits are exceeded, was operational throughout both releases.

The inspector reviewed the radiological aspects of an inadvertent draining of about 1.2 million gallons of water from the circulating water reservoir (CWR) to Lake Erie on October 17, 1985, as described in DER NP-85-0545. The event resulted from operation of the general service water system using a procedure having an error (wrong valve number). A sample of reservoir water contained no detectable activity. Further, the system is expected to remain free of radioactivity. Therefore, this event had no radiological consequences. Recognizing that the CWR could become a future potential release path, the licensee is adding a prerequisite (grab sample of CWR) to the procedure for operating the general service water system. Also, the procedure was corrected and measures taken to improve the technical review process for procedures.

The inspector reviewed radiological aspects of currently available data regarding a licensee internal Deviation Event Report DER NP 85-0596 (also being tracked by the licensee by Radiological Incident Deficiency Report 85-11-1) involving a spill of between 17,000 and 35,000 gallons of water from a ruptured seam around the top of the condensate storage tank on November 17, 1985. The plant had been shut down since October 11, 1985, for maintenance and installation of NRC required equipment. The release occurred after an electrical buss was deenergized for work in connection with the installation of some equipment. With the buss deenergized, the control room level indicators were lost for the condenser hotwell and for the condensate storage tank. The hotwell reject valves automatically opened and water was pumped from the hotwell into the condensate storage tank at about 2600 gpm. The spill, lasting an estimated ten minutes, was identified by security personnel and was terminated by operations personnel who also made an ENS notification. The liquid spilled into the concrete diked area having a clay/gravel bottom. Two drums (about 100 gallons) of the spilled water was recovered before the remainder soaked into the soil. Samples from the condensate storage tank showed a concentration of $1.3 \text{ E-6 } \mu\text{Ci/ml}$ for gamma emitters, principally Co 58, (about 1.4% of MPC for release to an unrestricted area) and $1.8 \text{ E-5 } \mu\text{Ci/ml}$ for tritium (about 0.6% of MPC for release to an unrestricted area) or about 2.4 μCi of tritium total and about 0.2 μCi of gamma emitters based on a 35,000 gallon spill.

A sample of spilled water in the diked area had a somewhat lower concentration, $2 \text{ E-7 } \mu\text{Ci/ml}$ of Co 58. Preliminary data on some surface soil samples showed $1.6 \text{ E-6 } \mu\text{Ci/gm}$ Co 58 and $3.7 \text{ E-7 } \mu\text{Ci/gm}$ Co 60.

A program of soil boring samples both inside and outside the diked area was begun in late December after evaluation of underground piping and cable locations but was stopped after an electrical cable was hit. After further evaluation the licensee plans to resume core sampling about February 1. Initial samples have been sent to Teledyne for evaluation. Results are not yet available. The licensee plans to issue a status report regarding plan of action by the first week of February. This matter was discussed at the exit and will be reviewed during subsequent inspections. (Open Item 341/86002-01).

Corrective actions specific to these licensee identified problems appeared satisfactory. The November 17, 1985 CST rupture is still being evaluated. Generic actions to reduce the frequency of personnel errors were discussed with management representatives following the inspection.

No violations or deviations were identified.

4. Reactor Coolant Chemistry/Radiochemistry

The inspector reviewed the licensee's reactor coolant chemistry and radiochemistry data for the period of January through December 1985 (preoperation through five percent power) to determine compliance with technical specification chemistry limits in Table 3.4.4-1 and specific activity limits in Technical Specification 3.4.5. Chlorides, conductivity and pH have all remained well within technical specification limits and in general within the more restrictive EPRI guides. The dose equivalent I-131 activity reached a maximum in early September of about $3 \text{ E-6 } \mu\text{Ci/gm}$. The licensee has not yet reached the plant condition requiring determination of $100/\text{E } \mu\text{Ci/gm}$.

The licensee has a program for plotting and trending coolant chemistry parameters along with the changing technical specification criteria based on plant mode of operation.

The licensee appears to now have implemented a good program for controlling technical specification required surveillances. The program includes scheduling, followup before it is too late to meet requirements, documentation, and three levels of review. Each surveillance procedure shows the technical specification criteria and reference for comparison with the measured or calculated value.

No violations or deviations were identified.

5. Air Cleaning Systems

Although technical specifications require testing of only the control room emergency filtration system (T.S. 3/4.7.2) and the standby gas treatment system (T.S. 3/4.6.5.3), the licensee also tests the other engineered safety feature (ESF) ventilation system (the technical support center (TSC)) as well as other plant filter trains. The non-ESF systems have HEPA filters but not charcoal. Records showed that tests

were completed in early 1985 and met applicable technical specification criteria. The licensee plans to replace or relocate four non-ESF filter housings before the first refueling to upgrade the filter housing (two systems) and for ALARA reasons in the other two cases.

No violations or deviations were identified.

6. Effluent Control Instrumentation

The inspector reviewed calibration records and setpoints for gaseous and liquid effluent monitors with no problems being noted. The effluent monitor setpoints have been conservatively established at about twice background reading. However, less restrictive, but permissible, setpoints are being established for three monitors all of which initiate ESF actuations. This action is being taken because of an occurrence in early January 1986 in which the control room HVAC emergency filtration system was initiated owing to an apparent anomalous spike on the radwaste building gaseous effluent monitor. The licensee stated that an LER will be forthcoming regarding the ESF actuation and that the problem of the anomalous spikes is being pursued with the vendor.

No violations or deviations were identified.

7. Startup - Comparison of Reactor Coolant Water Quality and Radioactive Effluents with Technical Specification Requirements

As noted previously, the licensee has attained a maximum power level of five percent to date. As noted in Section 4, reactor coolant water quality has remained within technical specification requirements to date. Further, both gaseous and liquid effluents have remained within technical specification requirements to date as noted in Sections 3 and 4, respectively.

8. Startup - Comparison of Effluent Monitor Readings Against Known Effluent Concentrations

To date, the absence or near absence of plant generated gaseous and liquid activity has not permitted meaningful comparison of effluent monitor readings against measured effluent concentrations.

9. Startup - Demonstrate that Gaseous and Liquid Radioactive Waste Systems Operate Per Design

The inspector reviewed the liquid radioactive waste system to evaluate its operability in accordance with design. This system is comprised of two subsystems, the waste collection system (equipment drains and run off) and the floor drain collection system. Preoperational tests were completed and the system turned over to Nuclear Production on June 1, 1985. Six test exceptions remain open involving four pieces of equipment (oil coalescer, etched disc filters, filter aid system, and radwaste

evaporators). The licensee plans to have this equipment operational in six months and this matter will be reviewed during a future inspection. (Open Item 341/86002-02).

The liquid radwaste system in general is operating satisfactorily and with the use of parallel or backup systems the licensee has been able to recycle an estimated 95% of liquids. A vendor liquid processing system has been onsite since before startup but has never been used and it is planned to return it to the vendor soon.

No violations or deviations were identified.

10. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. Open items disclosed during the inspection are discussed in Paragraphs 3 and 9.

11. Exit Interview

The inspector summarized the scope and findings of the inspection with licensee representatives (Section 1) at the conclusion of the inspection on January 17, 1986, and in subsequent telephone conversations on February 3, and 7, 1986. The inspector noted that personnel errors in one form or another were involved with the four LERs and two DERs having potential radiological consequences that were reviewed during this inspection and questioned the licensee regarding a generic approach to resolution of these recurring problems. In response, the licensee representatives noted that two programs recently undertaken will address the recurring problem of personnel errors. To address NRC concerns regarding recent operational occurrences, the Reactor Operations Improvement Plan (ROIP) was initiated¹² to improve performance and provide corrective action in six broad areas including consequences of errors. Secondly, the licensee is developing a Radiological Improvement Plan (RIP) that will similarly review the activities of the Radiological Controls and Chemistry group to enhance trend and problem identification to permit early application of corrective measures. This plan is expected to be in place near the end of the first quarter of 1986.

The inspector discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify such documents or processes as proprietary.

¹Letter dated October 19, 1985 - W. H. Jens to J. G. Keppler.

²Letter dated November 27, 1985 - W. H. Jens to J. G. Keppler.