U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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Report No:	50-341/96011
Licensee:	Detroit Edison Company (DECo)
Facility:	Enrico Fermi, Unit 2
Location:	6400 N. Dixie Hwy. Newport, MI 48166
Dates:	October 7-11, 1996
Inspector:	R. Glinski, Radiation Specialist
Approved by:	Thomas J. Kozak, Chief, Plant Support Branch 2 Division of Reactor Safety

Report Details

R1 Status of Radiation Protection and Chemistry (RP&C) Controls

R1.1 ALARA Committee Activities to Control Radiation Dose for RFO5

a. Inspection Scope (83750)

The inspector reviewed the ALARA Committee meeting minutes for the RFO5 outage and the control rod position indicating probe (PIP) replacement task. The inspector also interviewed personnel regarding the overall effectiveness of the ALARA Committee.

b. Observations and Findings

The ALARA Committee discussion of the PIP replacement task included a presentation of the proposed ALARA measures by the responsible contractors. These measures included mock-up training for the use of specially fabricated tools, the use of temporary shielding, and remote monitoring. The ALARA Committee further recommended that low dose waiting areas be designated for the workers and that only individuals who had completed mock-up training be allowed to sign onto the Radiation Work Permit (RWP) for this task. The effective implementation of committee recommendations was demonstrated by the dose savings achieved (See Section R1.2).

The ALARA Committee also discussed dose reduction measures for other RFO5 tasks. The RFO5 dose goal of 170 person-rem was based on dose rates from RFO4 and man-hours from RFO3. Dose reduction and ALARA measures planned included the following: (1) depleted zinc injection, (2) temporary shielding, (3) pre-outage and pre-job ALARA briefings, (4) remote communications and monitoring for drywell activities, and (5) the use of experienced personnel. Other ALARA measures such as the sequencing of shielding, insulation, and lighting installation were also discussed. The outage dose of about 120 person-rem was due in part to effective implementation of the ALARA Committee recommendations.

c. Conclusion

The ALARA Committee planning for dose reduction and ALARA activities for RFO5 was of sufficient scope and depth to contribute to dose savings achieved. The ALARA committee was effective in communicating high expectations to both the radiation protection staff and Task Managers.

R1.2 ALARA Reviews and Preparation of Radiation Work Permits for RFO5

a. Inspection Scope (83729)

The inspector reviewed Radiation Protection Technical Procedure (RPTP) 63.000.100, "Radiation Work Permits"; and RPTP 63.000.200, "ALARA Reviews". The inspector also reviewed several RWP packages, interviewed RP staff regarding ALARA planning, and observed implementation of ALARA measures.

b. Observations and Findings

The inspector verified that ALARA packages and RWPs were comprehensive and were prepared in accordance with station procedures. The reviewed RFO5 ALARA packages included the following: (1) historical data for airborne radioactivity, contamination levels, dose rates, and lessons learned, (2) pre-job briefing material for dose estimates/goals and radiation protection (RP) coverage, (3) consideration for dose reduction measures and engineering controls, (4) dosimetry requirements and hold points for specific jobs, and (5) appropriate management review. The ALARA reviews were conducted by radiological engineers and included discussions and/or walkdowns with experienced RP technicians and RFO5 Task Managers.

Although the ALARA reviews generally contributed to effective radiological control of outage tasks, the ALARA review for outage scaffolding installation did not accurately estimate the dose expenditure or work scope for this task. A significant contribution to this problem was the scaffolding required for the control rod position indicating probe (PIP) replacement. RP staff used historical data which did not represent actual work conditions. As a result, the amount of scaffolding needed and the time to install it was significantly underestimated. In addition to problems with the PIP scaffolding, there were also instances when RP staff was required to intervene to prevent the removal of scaffolding prior to insulation replacement.

In addition to the scaffolding problems encountered for the PIP replacement task, problems were encountered during the cable installation phase of this task. The PIP replacement project involved the removal and installation of 185 PIP cables and 185 thermocouple cables. The use of an experienced work crew and mock-up training in the Fermi 1 facility were effective exposure reducing initiatives during the cable removal phase of the project. This resulted in efficient cable removal and low dose expenditure for this evolution. However, the time required for cable installation was significantly underestimated. The dose expended for this evolution was 13 person-rem vs the expected 1.43 person-rem.

c. Conclusions

Overall, the ALARA reviews and RWP planning for RFO5 conducted by the RP staff were good. However, examples of inadequate pre-planning regarding scaffolding work and cable installation time for the PIP modification task were identified.

R1.3 Implementation of Lessons Learned from RF04

a. Inspection Scope (83750)

The inspector reviewed the lessons learned from RF04, interviewed plant staff regarding the evaluation of these issues for RF05 and observed field work to evaluate implementation of ALARA initiatives.

b. Observations and Findings

The licensee developed a RF04 lessons learned memo from ALARA post-job reviews and submitted the findings to the ALARA Committee for approval and implementation. The following is a partial list of the lessons learned implemented for RF05:

- Due to the Control Rod Drive (CRD) detorque machine being ineffective, the CRDs were manually detorqued in RF05. Also, floor interferences were moved prior to the CRD work.

- Remote dosimetry/communication was extensively used for drywell and refuel floor activities.

- Thread sealant was applied to the fittings for cans used to drain Local Power Range Monitors (LPRM), and new tubing was purchased.

- The use of a contaminated tool crib and a dedicated tool monitor for turbine work.

- RP staff received training on reactor components and the lessons learned from RF04.

Another dose reduction measure for RF05 was the installation of an undervessel grating to facilitate a reduction of time spent in a relatively high dose rate area. As part of the ongoing source term reduction program, five valves which contain stellite were scheduled for removal.

c. Conclusions

Lessons learned compiled from RF04 ALARA post job reviews were effectively implemented for RF05 and resulted in a net dose savings during the outage. The inspector observed that implementation of the findings into RF05 was effective.

R1.4 Observation of Work in the Radiologically Restricted Area (RRA)

a. Inspection Scope (83750)

The inspector observed work in the turbine building, the reactor building, the drywell, the refuel floor, and the reactor building steam tunnel (RB-1). The

inspector also interviewed RP and contract staff regarding radiological conditions within the plant.

b. Observations and Findings

During work observations, the inspector identified the following inappropriate practices:

- A worker was in contact with potentially contaminated turbine components as he performed a task in a clean area.
- Safety glasses were hung on a stantion which designated a contaminated area boundary.
- On two occasions, pancake friskers were found with the detector face down.
- Two tygon tubes from the scram discharge accumulators were not secured into the drain which was located just outside the contaminated boundary.
- A piece of chewed gum was identified in the reactor building.

When informed by the inspector of these occurrences, the RP staff took immediate and aggressive action. However, the identification of chewed gum in the reactor building indicated a continuing problem in good RP practice by plant personnel. The licensee had identified evidence of eating and drinking on August 19 in the Radwaste Building and on August 26 around the turbine office (DERs 96-0998 and 96-1042, respectively). The licensee also discussed this issue at a lessons learned meeting on August 28, 1996.

During observations of work activities, the inspector noted that postings and survey maps appropriately reflected plant conditions. The inspector independently verified selected survey data and no incorrectly posted areas were identified. In general, housekeeping was very good and no significant radiological impediments to work activities were observed. The inspector noted that personnel dosimetry was worn as prescribed. The monitoring and control of potential airborne radioactivity was excellent as evidenced by the numerous air samplers and HEPA units throughout the RRA. The inspector noted that temporary shielding for dose rate control was positioned properly.

The inspector observed excellent control of potentially contaminated materials. All potentially contaminated items were either within the designated areas or were bagged and labeled appropriately. In addition, RP coverage for specific jobs and routine rounds were evident. The inspector observed that RP techs at the control points adequately briefed workers and exercised appropriate control of various tasks.

c. Conclusion

Overall, the RP staff exercised effective control of work practices and radiological conditions within the plant. However, the inspector identified several instances of inappropriate practice and a continued weakness regarding evidence of eating and drinking in the RRA.

X1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management during an exit meeting on October 11, 1996. The licensee did not indicate that any materials examined during the inspection should be considered proprietary.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

P. Fessler, Plant Manager
R. McKeon, Assistant Vice-President, Operations
E. Kokosky, Radiation Protection Manager
S. Bartman, Chemistry Supervisor
D. Williams, Radiological Engineering Supervisor
L. Crissman, General Supervisor, Radiation Protection Operations
M. Offerle, General Supervisor, Radwaste
A. Antrassian, Licensing Engineer
P. Keenan, Radiological Engineer
J. Oetken, Radiological Engineer
J. White, Senior Radiation Protection Technician
R. Russell, Supervisor, Radiation Protection/Chemistry/GET Training

NRC

A. Vegel, Senior Resident Inspector, Fermi 2
C. O'Keefe, Resident Inspector, Fermi 2

Inspection Procedures Used

IP 83750, "Occupational Exposure"
IP 83729, "Occupational Exposure During Extended Outages"

Items Opened and Closed

None

LISTING OF DOCUMENTS REVIEWED

Refueling Outage 4 (RFO4) Lessons Learned Memo.

Radiation Protection Technical Procedure (RPTP) 63.000.100, Revision 8, "Radiation Work Permits".

RPTP 63.000.200, Revision 9, "ALARA Reviews", Revision 6, "Radiation Protection Instrument Calibrations".

Radiation Work Permit (RWP) 96-1047, "Installation and Removal of Dryweil Baseline Shielding".

RWP 96-1081, "Radiation Protection Coverage, Surveys, Source Checks, Surveillances, Calibrations, and Tours in the Drywell and the RB-1 Steam Tunnel".

RWP 96-1070, "Perform Scaffolding and Temporary Power and Lighting Work in the Reactor Building, Auxiliary Building, and Torus Room".

RWP 96-1086, "Perform PMs on All Drywell Coolers and RB-1 Steam Tunnel Coolers; Inspect, Lube Motors, and Test MCC."

RWP 96-1242/3, "Replacement of 8 Control Rod Drives".

NPRC-96-0326, "ALARA Committee Meeting Minutes: PIP Project Presentation".

NPRC-96-0367, "Special ALARA Committee Meeting Minutes: RFO5 Tasks".

Training Work Request (TWR) 94-0763, "Review RP Systems Course for Adequacy of Content Concerning Reactor Internals as Radiological Hazards".

TWR 95-0555, "Need to Review and Incorporate Lessons Learned from RFO4 - Training Material for Technicians and Contractors".