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REGION III

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Licensee: Detroit Edison Company

Facility: Enrico Fermi, Unit 2

Location: 6400 N. Dixie Highway
Newport, MI 48166

Dates: May 12 through May 30, 1997

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EXECUTIVE SUMMARY

Enrico Fermi, Unit 2 NRC Inspection Report 50-341/97005(DRS)

This inspection included aspects of licensee maintenance and engineering. The purpose of the inspection was to assess the conduct and control of your surveillance and maintenance activities. The enclosed report presents the results of that inspection.

Maintenance

- The emergency diesel generator 12 outage showed the licensee's ability to plan and execute a maintenance activity in a controlled and efficient manner (Section M1.1).
- The corrective actions to control measurement and test equipment (M&TE) have had positive results in resolving past problems with delinquent return of equipment and with delayed evaluation of the effects on equipment tested with M&TE that failed as-found calibrations (Section M1.2).
- One violation with two examples was identified concerning poor control of surveillance and post-maintenance testing on the diesel fire pump (Section M1.3).
- The use of the licensee's minor maintenance program called, "Tool Pouch Maintenance," on fused disconnect switches resulted in the lack of documentation for repetitive failures of the switches (Section M1.4).
- The inspectors identified three examples and one violation of working outside the work scope or a lack of documentation of work performed in the field. In addition, multiple barriers such as the electrical maintenance personnel, their supervisors, and a quality control (QC) inspector failed to identify this violation (Section M3.2).
- One weakness was identified for a lack of procedural control for cannibalizing parts from spare motor control center (MCC) positions when spare parts were not available from the warehouse (Section M6).

Engineering

- The engineering recommendation to not declare the diesel fire pump inoperable based on calculations which indicated the pump could fail the flow requirements at low speed was non-conservative and lacked proper focus on equipment operability (Section M1.3).
- Engineering personnel did not demonstrate a clear understanding of proper lubrication levels for plant specific equipment. One unresolved item was identified concerning the determination of proper oil level for rotating equipment (Section E2.1).
- The inspectors noted several weaknesses in engineering support for maintaining the plant. These weaknesses were: not knowing the expected break-in period for the

EDG alternator bearings and not trending the oil analysis with respect to the service time of the bearing and its oil (Section E2.2).

- One violation was identified concerning inadequate design control for nonsafety-related parts used in safety-related systems. The licensee's response to material control issues appeared to be slow (Section E2.3).

Report Details

I. Operations

O8 Miscellaneous Operations Issues

- O8.1 (Closed) Violation 50-341/95012-04b: Operations Conduct Manual MOP05, "Control of Equipment," was inadequate and was a contributor to a station battery problem. A battery charger was placed in service before maintenance and testing of the batteries had been completed. The inspectors reviewed Revision 5 of the manual and considered the changes to address this issue to be adequate. This item is closed.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Emergency Diesel Generator (EDG) 12 System Outage

a. Inspection Scope (62703)

The inspectors observed all or portions of the following work activities associated with the EDG outage and reviewed some completed work packages:

- 000Z954038 Oil leaking from coupling and instrument
- 000Z955261 Replace air receiver drain valve
- 000Z961121 Repair headshaft sleeve that has moved upwards
- 000Z961758 Investigate noise coming from muffler internals
- 000Z962346 EDG-12 fan is out of balance
- 000Z967890 Flush inboard and outboard bearings
- 000Z971260 Fuse 1 and 2 were noted to have loose clip in base assembly
- 000Z973910 Replace gasket and washers on blower
- R295940706 Electrically test time delay relay
- R398940624 Inspect/test 480 volt motor control center (MCC)
- R605960311 EDG 12 motor operated control inspection
- R609960311 Perform EDG 12 motor operated potentiometer inspection
- S979940725 Recalibration of EDG 12 standby heater discharge control temperature switch
- S999960327 Recalibrate 3 EDG 12 lube oil crankcase pressure "high" switches
- X895960315 X4103C003 - Inspect/test MCC, check fan, lube motor
- X899960315 X4103C004 - Inspect/test MCC, check fan, lube motor

b. Observations and Findings

The inspectors observed pre-job briefings in the electrical, mechanical, and instrumentation and control shops. Each supervisor used a checklist to ensure that management expectations for the pre-job briefing were addressed. Supervisors

appeared knowledgeable of the jobs, provided useful information to the workers, and were able to answer the worker's questions. Most workers appeared to have walked the jobs down before the briefings.

Supervision was present and actively involved with the workers at the job site. The major challenge to supervision was to ensure that the critical jobs were given priority when space conflicts existed. Overall coordination of the EDG 12 work activities was efficient and controlled.

The inspectors observed the use of measurement and test equipment (M&TE) for the work activities. The equipment was properly checked out for the specific jobs, was within the specified calibration period, and was returned appropriately to the M&TE crib. Workers appeared knowledgeable about the proper use of the test equipment. This issue is further discussed in Section M1.2.

The inspectors observed the use of the interim alteration checklist in documenting the lifting and landing of electrical leads. The inspectors specifically noted that the checklists were filled out as the work progressed. Through direct observation, periodic checks, and review of completed work documents, the inspectors concluded that the interim alteration checklist was being used properly.

Although the outage did not require any significant foreign material exclusion (FME) controls, the inspectors observed proper use of FME techniques for the jobs requiring some form of control.

c. Conclusions

The licensee expended significant effort in planning the activity and the results were good. Pre-job briefings were good and appeared to benefit from the use of a checklist. Supervision was present at the work site and provided useful input to personnel. Maintenance personnel showed clear capability to perform the tasks efficiently.

The EDG outage showed the licensee's ability to plan and execute a maintenance activity in a controlled and efficient manner.

M1.2 Control of Measurement and Test Equipment

a. Inspection Scope (62703)

The inspectors reviewed the use of M&TE because of previous problems identified in Inspection Report 50-341/95008, Section 6.1.2. The scope included looking for equipment remaining in the field beyond the time allowed, M&TE being used on activities that the M&TE was not checked out for, and the ability to track where specific M&TE was used, when a calibration failed.

b. Observations and Findings

The inspectors examined the signout documents for specific M&TE used for the EDG 12 outage. In each case, the M&TE was appropriately signed out for the

correct job and returned following the work. The inspectors examined records of other equipment and interviewed the attendant for the tool crib. The documentation for M&TE appeared to track the use of the equipment appropriately.

The licensee had recently implemented corrective actions for delinquent returns of M&TE. The new practice was to perform a weekly audit for delinquent equipment and contact the supervisors of the persons responsible for the delinquent equipment. A one-day grace period was allowed for returning the M&TE. If the equipment was not returned that day, the responsible person would lose his or her privilege to check out any other M&TE until the delinquent equipment was returned. The policy appeared to reduce the problem with delinquent equipment significantly.

Another recent change addressed control of M&TE when an "as-found" calibration failed. Once M&TE failed a calibration, all plant equipment serviced by the suspect M&TE needed to be evaluated to determine the effect of the calibration failure. The licensee had been writing a single deviation event report (DER) for each failure and requiring each work group to address the particular work packages associated with the M&TE. The single DER provided little accountability and resulted in delayed evaluations. The licensee changed the method to writing a separate DER for each work group that used the failed M&TE. This resulted in an increased number of DERs associated with M&TE calibration failures but increased the accountability and timeliness of addressing the effect on plant equipment.

c. Conclusions

The changes made to control M&TE have had positive results in resolving past problems. No problems were identified during this inspection. Delinquent M&TE was significantly reduced to an occasional single person having his or her privileges suspended. The licensee recently had an 11-week period where no one had privileges suspended.

M1.3 Inadequate Testing of the Diesel Fire Pump Following Maintenance

a. Inspection Scope (62703)

During a review of Work Request 000Z975065, the inspectors noted that the diesel fire pump (DFP) speed had been lowered; however, the post-maintenance testing (PMT) did not address the resultant change in discharge pressure and water flow. The inspectors reviewed previous flow testing results and licensee actions to address the issue.

b. Observations and Findings

The inspectors reviewed the work request written to correct a deficiency with the diesel tripping on over speed. The work was signed off as satisfactory on May 11, 1997. The inspectors noted that part of the corrective actions was to lower the diesel speed from 2440 rpm to 2150 rpm. The inspectors questioned the effect on the fire pump flow and whether the current flow test would be invalidated. The inspectors also noted that the nuclear shift supervisor (NSS) had raised questions concerning the effects of lowering the speed on the pump flow test. The NSS's

concern was documented in the work package and then lined out without any documented reason. The PMT was to perform a DFP weekly surveillance during which only the discharge pressure was monitored.

The licensee initiated a DER on May 27, in response to the inspector's questions. Initial calculation by engineering suggested that the flow test could potentially fail with lower engine speed. However, the DER stated, "This corrected data is theoretical and may vary from actual measured data. This data should not be used to classify the diesel fire pump as inoperable. Performing a flow test at the current engine speed will determine operability." The on-duty NSS reviewed the DER and declared the diesel fire pump inoperable and entered the limiting condition for operation.

On May 28, the licensee performed Fire Protection Procedure 28.504.003, "Fire Suppression Water System Simulated Auto Actuation Test," three times over a 12-hour period. The last attempt was successful. The acceptance criteria required a discharge pressure between 114.4 and 93.6 psig and the flow between 3375 and 4125 gpm. The final test results had the discharge pressure at 94 psig and the flow at 3407 gpm. Following the satisfactory test, the licensee raised the diesel speed to a band of 2250 to 2300 rpm and successfully performed the surveillance again.

Technical Specification (TS) 6.8.1 required that procedures covering the Fire Protection Program shall be established, implemented, and maintained. The Detroit Edison Maintenance Conduct Manual, MMA11, "Post-Maintenance Testing Guidelines," defined one criterion of satisfactory PMT as one that ensured no new or related deficiencies had been created by maintenance work. Following the maintenance work which changed a speed sensor switch, the diesel engine speed was also reduced. The PMT following the maintenance did not adequately address the effect of lowering the engine speed. Failure to properly test the DFP following maintenance is an example of a violation of TS 6.8.1 (VIO 50-341/97005-01a).

The inspector reviewed a previously completed DFP flow test 28.504.003 (completed May 2, 1997) and noted the diesel speed was outside the acceptable limits based on the use of a strobe tachometer. The diesel speed was recorded as 2440 rpm with the acceptable limits being 2100 to 2300 rpm. A note was entered on a discrepancy/resolution form stating that the installed tachometer was inoperative. No change was made to the procedure to allow the use of the strobe tachometer in place of the installed engine tachometer and no justification was provided for accepting the out-of-limit engine speed. The section of the surveillance was signed off as satisfactory with the pump pressure at 114 psig and the flow at 3855 gpm.

The test procedure noted that the fire pump pressure and flow were acceptance criteria but the procedure did not designate the diesel speed range as an acceptance criterion. However, the increased engine speed directly affected the pump discharge pressure and flow acceptance criteria as demonstrated by the May 28 testing. The licensee failed to recognize the significance of the over speed condition and inappropriately accepted the test as valid. This is considered another example of a violation of TS 6.8.1 (VIO 50-341/97005-01b).

c. Conclusions

The inspectors identified an example of poor control of a surveillance procedure and an example of inadequate post-maintenance testing. The licensee appeared to focus on passing the test rather than ensuring the equipment could perform its required function. The inspectors noted weaknesses in the licensee's review of completed packages and in the questioning attitude of multiple organizations. The entire problem with the fire pump could have been avoided by a critical review of the surveillance performed on May 2.

Engineering's recommendation not to declare the DFP inoperable based on the calculation appeared non-conservative. The non-conservative decision making by engineering was further amplified by the extensive efforts necessary to pass the surveillance at the lower engine speed and the small margin with which it passed. Operations promptly recognized the problem with the DER and appropriately declared the DFP inoperable until the test proved otherwise.

M1.4 Tool Pouch Maintenance

a. Inspection Scope (6703)

The inspectors reviewed the minor maintenance program called "tool pouch maintenance." This review included a review of the controlling procedure and discussions of the program with licensee personnel.

b. Observations and Findings

During discussions with licensee personnel on problems with the fused disconnect switches in the ITE 480 volt MCCs, licensee personnel stated that maintenance assistance provided to operators in the closing of the MCC fused disconnect switches included cleaning and lubricating the fused disconnect switches. They further stated that these actions were appropriately covered under the "tool pouch maintenance" program.

The inspectors reviewed Section 3.4.2 of MMA02, "Maintenance Program," Revision 1, which described "tool pouch maintenance." Enclosure "B" of the procedure listed four pages of examples of work to be performed under the tool pouch maintenance program. This list, which was not all inclusive, did not list minor cleaning and lubrication. Since this type of work was not listed, there was some question about whether or not it should be included. The uses of tool pouch maintenance on fused disconnect switches resulted in the lack of documentation for repetitive failure of these switches. Therefore, the extent of the problem was initially characterized incorrectly and was not considered significant. In addition, the licensee erroneously considered that the inability to manually close the switches was not a failure of the switches.

c. Conclusions

The use of "tool pouch maintenance" may be inappropriate for safety-related or important nonsafety-related equipment. Since records of this maintenance were

not normally prepared and retained, repetitive problems could be incurred without the knowledge of plant management, systems engineers or other personnel. The inspectors concluded "Tool pouch maintenance" would be inadequate for equipment or systems covered by the Maintenance Rule unless adequate controls were in place to ensure documentation and trending of repetitive equipment problems.

M3 Maintenance Procedures and Documentation

M3.1 Lack of Documentation of Work Performed

a. Inspection Scope (62703)

The inspectors reviewed work request (WR) package 000Z965287, "Torus Water Management Recirculation Line Isolation Valve Rework," and identified one example where the documentation of work performed in the work packages was unclear. The inspectors also interviewed various licensee personnel and identified that electrical maintenance personnel were assisting operations in closing electrical disconnect switches without approval or documentation in work packages.

b. Observation and Findings

The inspectors identified an example of weak documentation of work performed in WR 000Z965287. The mechanics performed blue checks on the old and new valve discs for valve G5100F609. The mechanics documented an unsatisfactory blue check on the new disc, but a satisfactory blue check on the old disc. However, the documents did not specify which valve disc was put back in the valve. The inspectors interviewed the supervisor who indicated that the old disc was put back in the valve because the blue check was satisfactory.

In addition, licensee personnel indicated to the inspector that when operators could not manually close fused disconnect switches, electrical maintenance personnel were requested to assist in the closure of the switches. The assistance involved lubricating the switches and sometimes pushing the switches closed with fuse pullers. However, the lubrication activities were neither authorized nor documented in any work packages. The inspectors did not identify any actual examples of this practice in the field.

M3.2 Work Performed Outside the Package Scope

a. Inspection Scope (62703)

The inspectors reviewed the following packages:

- 000Z965287 Torus water management recirculation line isolation valve rework
- 000Z971595 Temperature switch electric: Control Room Heating, Ventilation and Air Conditioning (CCHVAC) chiller compressor unit oil temperature
- 000Z958122 Fire protection diesel fire pump

- 000Z970741 Fire protection diesel fire pump
- 000Z974256 MCC 72E-5A Position 3C
- 000Z965876 Fire protection electrical driven fire pump outlet check valve
- 000Z974392 MCC for torus water management system (TWMS) return to CS outboard isolation valve
- 000Z961484 480 Volt motor control center No. 72C-2A
- 000Z974393 Control rod drive pump room cooler
- 000Z964774 CCHVAC emergency air north intake division 2 isolation damper

b. Observations and Findings

Straightening a Bent Valve Stem for a Nonsafety-Related Valve Without Approved Work Package

During the review of WR 000Z965287, the inspectors identified that a new valve stem staged for valve G5100F609 rework was found bent and the mechanics straightened it without approved instructions in the packages. Mechanics were trained to check total indicated runout (TIR) on new valve stems before installing them. The mechanics identified that the TIR on the new stem was not within the specification of less than or equal to .0055 inches per foot. The mechanics then straightened the new stem, recorded the new TIR on the new stem, and put it in the valve. Although this action was documented in the package, straightening of the bent valve stem was not within the scope of the package.

Work on a Safety-Related Spare Switch Without Approved Work Package

After restoring MCC 72E-5A Position 3C for TWMS return to residual heat removal outboard isolation valve, the MCC switch opened unexpectedly when an operator was closing the door. The switch was reclosed and remained closed. Due to this problem, on April 24, 1997, electrical maintenance personnel performed maintenance on the fused disconnect switch using Work Request 000Z974256. After cleaning and lubricating the switch, the operation of the switch was unsatisfactory. The package was revised on April 25 to troubleshoot and replace necessary parts on the switch. On April 28, the electrical maintenance personnel swapped the following parts between MCC 72E-5A Positions 5C (a spare fused disconnect switch) and 3C: the rotary switch, the lower fuse block, and the electrical disconnect switch. Following the swap, both switches failed after cleaning and lubricating. On April 29, electrical maintenance personnel recleaned, relubricated, and exercised the switch mechanisms. Both switches operated satisfactorily.

The work package was initially revised to reflect using parts from the spare fused disconnect switch at Position 5C; however, some activities were performed beyond the scope of the package as follows:

- Placing the defective parts from MCC 72E-5A Position 3C back into the spare fused disconnect switch,

- Cleaning and lubricating the spare fused disconnect switch which now contained defective parts from MCC 72E-5A Position 3C, and
- Exercising the spare fused disconnect switch to ensure smooth operation of the switch.

In addition, Step 7 of the work request package required that if spare parts were not available from the warehouse, personnel were to remove needed parts from the spare position of the MCC, document the action in the work request, and initiate a work request initiation form (WRIF) to work the spare position when parts were returned after refurbishment. However, on April 28, after the parts were removed from the spare position, maintenance personnel failed to initiate a WRIF for the spare position and performed work on the spare position without approved instructions.

The inspectors were concerned this condition of working beyond the initial scope of the work request and failure to follow the work package were not recognized by the involved maintenance personnel, their supervisors, and the quality control (QC) inspector. Although the first QC inspector did not observe swapping of the parts between the switches, a second QC inspector during the package closeout review, did not recognize that the maintenance personnel had worked outside the scope of the package. The licensee did not recognize the inappropriateness of working on the spare fused disconnect switch until prompted by the inspectors.

10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," required, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Failure to have appropriate instructions or procedures for performing maintenance on the MCC 72E-5A Position 5C is a violation of 10 CFR 50, Appendix B, Criterion V (VIO 50-341/97005-02).

M3.3 Conclusions on Maintenance Procedures and Documentation

The inspectors identified four examples where activities were performed outside the scopes of the work packages or where work documentation lacked detail. The four examples were:

- A lack of documentation in the use of a valve disc in the torus water management system,
- A lack of documentation for lubrication and manual assistance of closing electrical disconnect switches,
- Straightening a bent valve stem which was beyond the initial work instruction, and
- Performing maintenance on a spare fused disconnect switch which was beyond the scope of the work package for repairs of another switch.

A violation of 10 CFR 50, Appendix B, Criterion V, was identified for the last example. The inspectors randomly sampled 15 work packages and identified deficiencies with three work packages (Two packages were discussed in this section and the third package was discussed in Section M1.3). The inspectors

were concerned that 20 percent of the sampled packages contained errors or violations not previously identified by multiple Detroit Edison personnel.

The inspectors concluded that work documentation in selected packages was poor because the packages were not stand alone documents and did not contain sufficient detail for work performed in the field.

M3.4 Procedural Detail and Skill of the Craft

a. Inspection Scope (62703)

The inspectors observed work activities and noted cases where the work results did not match what was expected.

b. Observations and Findings

Following the EDG 12 outage the inspectors noted that the oil levels for the alternator bearing were below the scribed line on the sight glass. The licensee indicated that the oil had been appropriately filled but had settled after a few hours. This was due to the high viscosity of the oil. The work request neither provided guidance on the appropriate level to fill the oil nor did it warn the mechanics to return later and recheck the oil level.

During the DFP flow testing, the inspectors noted personnel using a strobe tachometer to determine the speed of the fire pump. The individual did not notice that the reading obtained was twice the speed that was expected. When the inspector questioned the value, the individual confirmed the reading with another strobe tachometer and documented the value. Later the system engineer pointed out that the strobe was flashing twice for each revolution. The correct reading was obtained and the correction was entered into the test procedure.

During work on EDG 13, an instrument technician increased the frequency too quickly during testing of a tachometer and he obtained and recorded the wrong value. During a second attempt, the frequency was increased more slowly and the correct value was obtained. There was no guidance to instruct the technician to increase the frequency slowly and the technician demonstrated a need for such guidance.

c. Conclusion

The licensee appeared to depend on the skill of the craft and minimized specific guidance in the procedures. In these three examples the procedures were weak and did not contain adequate guidance for the skill level of the assigned craft personnel.

M6 Maintenance Organization and Administration

M6.1 Lack of Control for MCC Replacement Parts

a. Inspection Scope (62703)

The inspectors and the licensee quality assurance (QA) organization identified a lack of control for MCC parts replacement. The inspectors reviewed WR 000Z974256; DER No. 970875, dated May 28, 1997, for QA Audit No. 97-0118; and Nuclear Generation Memorandum NPSC 97-0031.

b. Observations and Findings

On April 25, 1997, in response to a recent problem with MCCs, the licensee issued a memorandum delineating an alternative method to obtain MCC replacement parts. It stated that, "if the required parts are not available from the warehouse and there is a spare MCC position which is also Q or Q1M the part required may be removed from that position and used." The memorandum further stated that all positions of an MCC have the same "Q" qualification and a new WRIF was to be generated to rework the spare position when approved parts became available.

After this memorandum was issued, many work packages contained similar instructions to remove needed parts from the spare position of an MCC, to document this removal, and to initiate a WRIF to work the spare position. However, the inspectors identified a case where the mechanics swapped parts between two fused disconnect switches and reinstalled the then-defective parts in the spare position (See Section M3.2). This practice of taking parts from a spare position did not always involve an engineering evaluation and was not controlled by procedures.

During QA Audit 97-0118, the licensee QA organization identified the same concern with cannibalizing parts without proper controls in place. Therefore, traceability, component storage level, reviews for equivalency, or qualification of similar parts did not receive adequate QC or Material Engineering review.

The licensee indicated to the inspectors that taking replacement parts from spare positions was necessary due to the lack of available parts. However, the inspectors considered the control for this practice lacked forethought before implementation and lacked proper engineering controls.

c. Conclusion

The inspectors concluded that the current practice of taking replacements parts from spare MCC positions lacked control and was a weakness in the MCC replacement parts program.

M8 Miscellaneous Maintenance Issues

M8.1 (Open) Violation 50-341/95012-02a: Use of inadequate procedures in performing electrical maintenance activities. The inspectors reviewed the actions taken on this

item. The existing electrical maintenance procedures were to be reviewed by the licensee for adequacy. The review of these procedures had not been completed. This item will remain open until the review of the electrical maintenance procedures has been completed by the licensee.

- M8.2 (Closed) Violation 50-341/95012-02b: The racks and terminals of the station batteries had deteriorated due to corrosion. In response to the violation, the batteries and racks were thoroughly cleaned. The inspectors walked down and observed the material condition of the station batteries. Battery and rack conditions appeared to be good with only one small spot of corrosion noted. Additional actions taken included a required weekly walkdown of the batteries. This item is closed.
- M8.3 (Closed) Violation 50-341/95012-04a: Maintenance Procedure 35.309.001 was inadequate and allowed the connection of a test resistor bank to the batteries which rendered the batteries inoperable. The inspectors reviewed the changes made to the procedure. The changes appeared to be adequate. This item is closed.
- M8.4 (Closed) Violation 50-341/96013-03: Failure to identify and correct a disconnected electrical lead. The inspectors reviewed actions taken on the disconnected lead issue. Procedures controlling the lifting and landing of electrical leads appeared to be adequate. During the observation of maintenance activities, the inspectors noted that the control of lifted leads in the field appeared to be good (Section M1.1). This item is closed.

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 Proper Lubrication Levels for Rotating Equipment

a. Inspection Scope (37550)

The inspectors walked down the EDG 12 following the maintenance work and before PMT. The generator bearing oil sight glasses had scribed lines in the middle of the sight glasses. The inspectors found the outboard bearing with the meniscus just below the scribe line and the inboard bearing oil level at a full $\frac{1}{4}$ inch below the scribe line. The system engineer indicated that the proper oil level was $\frac{1}{2}$ to $\frac{3}{4}$ full on the sight glass. The inspectors questioned the appropriate oil level for providing adequate lubrication to the bearings.

b. Observations and Findings

Following discussions with the EDG system engineer, the inspectors reviewed the operator round sheets. These sheets also referenced the level as $\frac{1}{2}$ to $\frac{3}{4}$ full for the appropriate oil level. However the vendor's manual indicated that the level should be maintained at the scribed mark ($\frac{1}{2}$ position). The licensee could not provide justification for the $\frac{3}{4}$ level denoted on the round sheet. The licensee contacted the vendor but was unable to obtain clear guidance. The inspectors requested a drawing that would show the bearing internals in relation to the sight

glass indication; however, the licensee could not provide the information. The licensee initiated a DER to address the conflicting information.

In addition, the licensee did not give operators guidance for the correct oil level for the alternator when the EDG was operating. The vendor's manual specifically stated, "Do not check the oil level and do not add oil while the alternator is running!" However, the inspectors questioned the adequacy of such guidance. The EDGs are expected to operate continuously for several days during a design basis accident. Without guidance, operators would have no warning of inadequate oil levels and therefore allow the bearing to run to failure.

During a plant tour, the inspectors also noted that the high pressure coolant injection (HPCI) booster pump had similar sight glasses. The operator's round sheets for HPCI provided no guidance on the proper oil level either in the standby or operating condition. The vendor manual indicated normal oil levels should be maintained but did not say what that level was. In addition, the licensee could not provide drawings of the bearing internals in relation to the sight glass with sufficient detail to assure the appropriate oil level. The inspector was informed that the operators had been trained during on-the-job training as to the appropriate oil level. However, the licensee could not provide any conclusive information on the correct level.

The licensee acknowledged that appropriate lubrication levels were not clear and was planning to research the issue further. The licensee indicated the results would be incorporated into an existing program.

Understanding of appropriate lubrication levels for rotating equipment was fundamental in ensuring reliable equipment operation. However, engineering did not demonstrate that understanding during this inspection. The inspectors consider this item an unresolved item (URI 50-341/97005-03) pending the licensee's review of lubricating levels for rotating equipment and inspector review of the licensee's final documented guidance to the staff on proper oil levels.

c. Conclusions

One unresolved item was identified concerning the determination of proper oil level for rotating equipment. The inspectors concluded that engineering did not have an adequate understanding of proper lubrication levels for the plant specific equipment.

E2.2 Oil Analysis for Rotating Equipment

a. Inspection Scope (37550)

Emergency Diesel Generator 12 had the outboard alternator bearings replaced in November 1996. The inspectors reviewed the oil analysis that led up to the replacement and following the replacement.

b. Observations and Findings

The licensee used oil analysis as a tool to predict future problems with equipment. A graph of the severe wear indication (SWI) for the outboard alternator bearing from late 1992 to October 1996 did not show a trend before a significant step change. Before bearing replacement in November 1996, the graphed data was scattered with the highest value less than 20,000 and most values less than 10,000 SWI. Less than 10,000 SWI was the expected value. In November 1996, the indication reached 110,000 as a step change and the bearing was changed out.

Following the bearing replacement, the oil analysis for SWI continued to be scattered with all but one value above the 10,000 SWI maximum expected value. The licensee indicated that the higher-than-expected values after the bearing change were due to break-in wear on the bearing; however, the licensee had not contacted the vendor for guidance on how long the break-in period should be. During the EDG 12 outage, the bearing oil reservoir was drained and refilled to the top of the sight glass level, and the engine was rotated two revolutions. Then the oil was drained and replaced. The oil sample after the 3-hour post-maintenance testing resulted in an SWI of 12,480.

The inspectors further noted that the information provided to an independent laboratory performing a separate oil analysis was not complete. The laboratory was not provided with the service time of the bearing and its oil. Without correlating the service time of these two factors, the results could be misleading.

c. Conclusion

The licensee had been monitoring bearing vibrations for the EDG 12 alternator; the data appears satisfactory. However, not knowing the expected break-in period for the bearing and not trending the oil analysis with respect to the service time of the bearing and oil raised additional uncertainties concerning the status of the bearing. The inspectors considered this lack of knowledge a weakness in engineering support to maintaining the plant.

E2.3 Inadequate Engineering Evaluation of Parts and Components

a. Inspection Scope (37550)

During the observation of maintenance activities on EDG 12, the inspectors noted that three parts installed during the maintenance were nonsafety-related. The inspectors discussed the use of nonsafety-related parts on safety-related equipment with the licensee and reviewed engineering evaluations for the three nonsafety-related parts used on EDG 12.

b. Observations and Findings

Inadequate Engineering Evaluation for Use of Nonsafety-Related Parts in EDGs

Plant procedures required an engineering evaluation if nonsafety-related parts were used for the repair or modification of safety-related equipment. The evaluation would be performed to verify the acceptability of the part to be used.

Engineering evaluations for two of the nonsafety-related parts installed on EDG 12 on May 13, 1997, appeared to be adequate. However, the evaluation for the third part, a rectangular vegetable fiber gasket used for the turbo charger blower cover gasket, appeared to be inadequate. The engineering evaluation checklist for the evaluation, dated August 2, 1989, indicated that the gasket did not perform a critical function and would not fail. However, the inspectors disagreed with this conclusion. The possibility of causing significant operational problems appeared to exist if the gasket failed. In addition, five questions were inappropriately marked "NA" and the required justifications were not included for answers to the questions on the form.

10 CFR 50, Appendix B, Criterion III, "Design Control," required that measures be established for the selection and review for suitability of application of materials, parts, equipment and processes that are essential to the safety-related functions of structures, systems and components. The installation of the nonsafety-related turbo charger blower cover gasket on safety-related EDG 12 without performing an adequate engineering evaluation which addressed the suitability of application of the parts to the safety-related functions of the EDGs is an example of a violation of 10 CFR 50, Appendix B, Criterion III (VIO 50-341/97005-04a).

The inspectors identified this problem to the licensee personnel and management during several discussions. During the discussions of this problem, licensee personnel stated that DER 96-0903 had been written on inadequate justifications for engineering evaluations on August 7, 1996. The action taken on the DER appeared to be limited to enhancement of the evaluation criteria and did not address reevaluation or control of parts which were previously inadequately evaluated. The inspectors noted that the DER stated, "This is a weakness, not a serious problem."

The action taken on DER 96-0903 to correct the problem of weak evaluations for using nonsafety-related parts in safety-related applications was inadequate. In addition the previously identified deficient evaluation for the gasket was not corrected. As a result, the licensee continued to install similar gaskets in EDG 13 on May 20 and in EDG 14 on May 27, without further evaluations. Until a proper engineering evaluation is completed, it is not known if these gaskets would affect the operation of the three EDGs.

Even though DER 96-0903 was written on this problem on August 7, 1996, no actions were taken to verify the adequacy of engineering evaluations prior to use of nonsafety-related parts and no controls were in place to prevent the installation of inadequately evaluated nonsafety-related parts. As a result, inadequately evaluated nonsafety-related parts continued to be used in safety-related equipment until at

least May 27, 1997. This is an example of a violation of Criterion III (50-341/97005-04B(DRS)).

Generic Justification for Use of Parts in Plant Equipment

The licensee has assigned a generic plant identification system (PIS) number for ordering expendable items such as rags, cleaners, etc. Licensee personnel stated that this PIS number was not intended for parts used in plant equipment. The licensee identified that plant personnel had inappropriately used this generic PIS number to order nonsafety-related parts to be installed in the plant. The licensee indicated that the root cause appeared to be a lack of knowledge of the purpose of this PIS number. In other cases, personnel appeared to use this PIS number to avoid required engineering evaluations for nonsafety-related parts. The licensee stated that additional training was to be provided to maintenance personnel. In addition, a memorandum was issued by the Plant Manager to clarify the use of generic PIS numbers and ensure that engineering evaluations would be performed when needed. Licensee action on this problem appeared to be adequate.

c. Conclusions

One violation with two examples was identified concerning poor design control for use of nonsafety-related parts in safety-related systems. Material control practices appeared to be weak. Some engineering evaluations, allowing the use of nonsafety-related parts in safety-related equipment, were inadequate. In addition, licensee personnel had found ways to bypass the entire process. The emphasis appeared to be on expediting work without significant concern about the integrity of replacement parts.

In using nonsafety-related gaskets on EDGs, the licensee appeared to be slow in responding to the concern and providing additional evaluations.

E8 Miscellaneous Engineering Issues

- E8.1 (Closed) Violation 50-341/95003-03: Use of unapproved material on safety-related equipment. This violation was written for using non-approved cleaners and lubricants in electrical applications. The inspectors reviewed procedure 35.000.217, "Maintenance Lubrication," Revision 28, and other actions taken to ensure that only approved lubricants and cleaners were used to clean and lubricate safety-related components. Actions taken included a prohibition on the use of Cramolin, a known non-qualified contact cleaner. During the observation of maintenance activities the inspectors noted that only approved cleaners and lubricants were used. This item is closed.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on May 30, 1997. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

S. Booker, General Supervisor, Electrical Maintenance
P. Borer, Vice President
D. Cobb, Superintendent, Operations
R. Cook, Acting Supervisor, Compliance
M. Caragher, Supervisor, Material Engineering
R. Delong, Superintendent, System Engineering
P. Fessler, Plant Manager, Operations
D. Gipson, Senior Vice President, Generation
J. Green, Maintenance Superintendent, Maintenance Support
J. Hughes, Supervisor, Inspection and Surveillance, QC
R. Matthews, Maintenance Superintendent I&C
N. Peterson, Acting Director, Licensing
K. Sessions, Work Control
T. Schehr, Engineer, Operations
R. Wittschen, Compliance Engineer

NRC

G. Harris, Senior Resident Inspector
N. O'Keefe, Resident Inspector

INSPECTION PROCEDURES USED

IP 37550: Engineering
IP 62703: Maintenance Observation

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-341/97005-01	VIO	failure to maintain DFP engine speed within acceptable operating limits and to perform adequate PMT
50-341/97005-02	VIO	failure to have approved instructions prior to performing maintenance on a spare disconnect switch
50-341/97005-03	URI	licensee review of lubricating levels for rotating equipment
50-341/97005-04	VIO	inadequate engineering evaluation of nonsafety-related parts

Closed

50-341/95003-03	VIO	use of unapproved material on equipment
50-341/95012-02b	VIO	deterioration of station batteries
50-341/95012-04a	VIO	inadequate procedure rendered a station battery in inoperable
50-341/95012-04b	VIO	inadequate procedure placed a station battery in service before maintenance was completed
50-341/96013-03	VIO	failure to identify and correct a disconnected electrical lead

Discussed

50-341/95012-02a	VIO	use of inadequate procedures in performing electrical maintenance activities
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LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
CCHVAC	Control Room Heating, Ventilation and Air Conditioning
CS	Core Spray
DECo	Detroit Edison Company
DER	Deviation Event Report
DFP	Diesel Fire Pump
DRS	Division of Reactor Safety
EDG	Emergency Diesel Generator
FME	Foreign Material Exclusion
HPCI	High Pressure Coolant Injection
I&C	Instrumentation and Control
M&TE	Measurement and Test Equipment
MCC	Motor Control Center
MMA	Maintenance Conduct Manual
NRC	Nuclear Regulatory Commission
NSS	Nuclear Shift Supervisor
NUREG	Nuclear Regulatory Guide
PDR	Public Document Room
PMT	Post-Maintenance Testing
QA	Quality Assurance
SWI	Severe Wear Indication
TIR	Total Indicated Runout
TS	Technical Specification
TWMS	Torus Water Management System
URI	Unresolved Item
VIO	Violation
WRIF	Work Request Initiation Form