U. S. ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS

REGION III

RO Inspection Report No. 050-010/73-0)

Licensee: Commonwealth Edison Company
P. O. Box 767
Chicago, Illinois 60690

Dresden Nuclear Power Station
Unit 1
Morris, Illinois

License No. DPR-2
Cateory: C

Type of Licensee: GE, BWR, 210 Mwe

Type of Inspection: Routine, unannounced

Dates of Inspection: December 10 - 14, 1973

Dates of Previous Inspection: August 8, 9, 16, 17 and 21, 1973

Principal Inspector: F. Maura F Maura 1/31/74 (Date)

Accompanying Inspector: C. Brown C Brown 1/31/74 (Date)

Other Accompanying Personnel: None

Reviewed By: H. C. Dance, Senior Reactor Inspector, BWR Operations H. C. Dance 1/31/74 (Date)

SUMMARY OF FINDINGS

Enforcement Action

The following violation is considered to be of Category II severity:

> 10 CFR Part 50, Appendix B, Criterion XVI, states in part that, "measures shall be established to assure that conditions adverse to quality, such as failures or malfunctions are promptly identified and corrected.
>
> Contrary to the above the licensee did not make corrective repairs following the failure of core spray valve CS-16 on August 7, 1973. This led to a second failure of the valve on August 21, 1973. The licensee's corrective measures were reviewed during this inspection. This item is considered resolved. (Paragraph 8.a)

Licensee Action on Previously Identified Enforcement Items

The corrective actions listed in the licensee's response to our letter of enforcement dated September 14, 1973, were reviewed. Two of the three items have not been resolved. (Paragraph 2.b)

Unusual Occurrences

A. Core spray valve CS-16 failed to close twice. (Paragraph 8.a)

B. Abnormal degradation of weld in cleanup loop. (Paragraph 7.a)

C. Core spray pump 1A failure. (Paragraph 8.b)

D. Nuclear instrumentation power range channels scram setpoint drift. (Paragraph 4)

E. Unplanned radioactive release from Unit 1 radwaste. (Paragraph 12.a)

Other Significant Findings

A. Current Findings

> The current refueling and maintenance outage has been extended a fourth month due to higher than expected radiation dose rates in work areas and difficulties experienced with the sphere integrated leak rate test. The unit is scheduled to start operations by February 15, 1974.

B. Status of Previously Reported Unresolved Items: None reported.

Management Interview

The following subjects were discussed at the conclusion of the inspection on December 14, 1973, with Messrs. W. Worden, Station Superintendent; F. Morris, Assistant Station Superintendent; A. Roberts, Supervising Engineer, Technical Staff; T. Watts, Operating Engineer, Unit 1; and R. Williams, Engineer.

A. The inspector inquired if Commonwealth Edison Company was to receive a report from General Electric stating the present and predicted metallurgical condition of Unit 1 control rod blades as a result of the examination performed by General Electric on blade B-87 which was removed from the core at the end of cycle VII.

   The licensee stated they would determine the status of the report and inform the inspector as soon as it became available.

B. The inspector noted that the modification needed to facilitate testing of the liquid control system lines had a late start and wondered if the licensee intended to meet its earlier commitment.

   The licensee responded that the lines will be verified to be open during this outage even if the modification is not completed in time. (Paragraph 9.a.(2))

C. The inspector stated that following LOCA core spray valve CS-16 becomes the only barrier between containment and the storm sewer, and we expect it will be included as an isolation valve in the sphere integrated leak rate test. We also understand that a study is in progress to add a second isolation valve in that line and suggest the study be given high priority.

   The licensee acknowledged the study in progress, but was reluctant to consider CS-16 an isolation valve and include it in the sphere leakage test. (Paragraph 8.a)

D. The inspector stated that commitments to the AEC are not being carried out as noted by the lack of procedure QP 10-54 Revision 0, and a firm purchase order for new nuclear power range chassis. (Paragraphs 2.b(1) and (3))

E. The inspector stated that the breakdown in the maintenance department system of handling Work Requests, which led to the second failure

of core spray valve CS-16, constituted a violation of 10 CFR Part 50, Appendix B, Criterion V.

In that the licensee's corrective action to prevent similar failures in the management system appears adequate a response to the violation will not be required. (Paragraph 8.a)

F. The inspector stated that it was his understanding fuel element UN-350 would not be used unless the engineering evaluation in progress determines the repairs made are acceptable and the depth of the scratches is equal to or less than 3 mils (10% clad thickness).

The licensee replied the understanding to be correct but was not sure about the 3 mil criteria and stated they would check and inform the inspector at a later date. (Paragraph 5.c)

G. The inspector stated he had reviewed the last NRB Audit of Operations at the site and will followup on their recommendations at a future inspection.

H. The inspector stated that he understood that the addition of two sampling points for the dew cell system would be completed before reactor startup. The licensee replied that the understanding was correct. (Paragraph 3.a)

I. The inspector stated that he understood that the polyurethane seals were left in the shock suppressors and asked if there were any plans to change them. The licensee stated that replacement of seals would conform to final policy taken when the review of the seals are complete. The licensee also stated that the fluid is to be left clear and not colored as recommended by the vendor. The inspector stated that he agreed with the course of action. (Paragraph 8.c)

REPORT DETAILS

1. Personnel Contacted

W. Worden, Station Superintendent
F. Morris, Assistant Station Superintendent
A. Roberts, Supervising Engineer, Technical Staff
J. Watts, Operating Engineer, Unit 1
R. Williams, Engineer
J. Bowers, Engineer, Technical Staff
R. Canalas, Engineer, Technical Staff
M. Turbach, Engineer, Technical Staff
J. Wujciga, Engineer, Technical Staff
R. Pavlick, Supervisor, Radiation Protection
W. Joyce, Training Supervisor
W. Hildy, Instrument Engineer
N. Jackiw, QC Engineer, Technical Staff
J. DeLeo, Shift Engineer
H. Whitehead, Shift Foreman

2. Organization and Administration

a. Retraining

An early reinspection of the licensee's retraining program was conducted in light of new commitments made by the licensee to DOL in letter (Able to Skovolt) dated November 20, 1973, which contradicted earlier statements made by the licensee.1/ The licensee stated during the inspection that their program will comply with the above referenced letter and all previous statements are void.

The review determined that:

(1) Examinations to determine licensee's knowledged of subjects covered by the lectures are not being given. The licensee expressed reluctance to change its program in mid-year, but agreed to commence giving the exams for lectures given after January 1, 1974.

(2) The annual written and oral examinations will be given to all site personnel holding an RO or SRO license, and review to

1/ RO Inspection Report No. 050-010/73-03.

determine each licensee's qualification and need for retraining or accelerated retraining will be completed prior to the start of next school year.

(3) The licensee stated it considers all licensed site personnel as being actively engaged in licensed duties and therefore, not required to hold shift supervisory duties at least 8 hours/year. The inspector stated that he does not consider the Station Superintendent, Assistant Superintendent, Technical Staff Supervisor and Training Supervisor, all of whom hold SRO licenses as being actively engaged in licensed duties, but that the final word would have to come out of Licensing. In addition the inspector does not consider 8 hours/year as sufficient to enable a person to relieve a shift supervisor in an emergency with an adequate degree of confidence.

b. Response to Item of Noncompliance

The corrective measures to items of noncompliance outlined in the licensee's letter (Lee to Keppler) dated October 3, 1973, were inspected. The following findings were noted:

(1) QA Documentation of Receipt Inspections

Contrary to the letter commitment, Quality Procedure 10-54 Revision 0 had not been issued. The licensee stated it expected the procedure would be issued during the following week. The inspector reviewed a draft copy of the procedure and noted that it does not address the problem of spare parts, for safety related components, purchased prior to the issuance of CE's Quality Assurance Manual.

(2) Documentation of Tests Following Maintenance

The licensee has modified the handling of Work Requests for safety related components to include QC Documentation Requirements. Future inspections will determine if this step will prevent recurrence of missing documentation. This item is considered resolved.

(3) Modification to the Power Range Monitors

Contrary to the commitment made in the letter, the new electronic chassis for each power range monitor have not been ordered as of December 14, 1973. According to the licensee the General Electric Company is making an engineering evaluation of required

components based on a list supplied by CE to CE November 14, 1973.

c. Record Review

(1) Shift Engineers Log - 9/3 - 30/73.

(2) SRB Minutes - 7/31/73 to 9/28/73.

(3) Deviation Reports 1-73-29 thru 1-73-36.

The inspector noted that Deviation Reports 1-73-30 (covering an event that occurred on July 11), 1-73-36 (August 23), 1-73-37 (September 3) and 1-73-42 (October 9) had not been issued. The licensee is still having difficulties expediting such reports.

3. Reactor Coolant

a. Leak Detection

The installation of two additional sample points for the dew cell system is to be completed during the 1973 refuel outage. The two sample points are located low in the East and West pipeways in the area of the recirculation pump piping. With additional sampling points the licensee plans to maintain the weekly sample cycle by drawing air activity samples from two compartments on two days of the week.

The review of August and September records of air sample activities from the individual areas indicated that the normal activity level for the 6 hour decay count was approximately 10^{-10} uCi/cc. The 6 hour decay count on September 18, 1973, showed that the activity had increased by a factor of 100 or more in the areas because of the leak in the "A" cleanup loop. A quantitative analysis of leak size was not available. The licensee stated that the sensitivity (gal./min) of the leak detection system is not known.

b. Primary Chemistry

The chemistry records for August and September were reviewed. The results of the daily analysis were as follows:

	August	September
Conductivity	0.69 - 0.28	0.69 - 0.33 umho/cm^2
pH	6.7 - 8.2	7.0 - 7.9
cl^-	0.015 - 0.043	0.022 - 0.075 ppm
I total	0.89 - 3.9	2.0 - 3.6 x 10^5 pCi/l

All are within Technical Specifications limits.

c. Secondary and Primary System Piping Configuration

A review of the primary and secondary piping configuration inside the "A" secondary steam generator room showed that the steam generator secondary steam outlet line crosses the primary coolant return to reactor line. No barrier or restraint between the two lines exist. Therefore, it appears that failure of the primary coolant line could cause rupture of the secondary system piping. The licensee plans to include the secondary system as part of the sphere integrated leak rate test.

4. Reactivity and Power Control

a. Power Range Channels Scram Setpoint Drift

On October 23, 1973, the licensee found that nuclear instrument power range channel 5 high level trip setting had drifted above Technical Specification limits. The event details were reviewed and found to be as stated by the licensee in his letter to DOL dated November 16, 1973. From all the data obtained since the replacement of the potentiometers it is obvious to the licensee and the inspector answer to the problem will be the replacement of the micro-microammeters.

5. Core and Internals

a. Refueling

Fuel cycle VIII generated 255,766 mwd for an average cycle burnup of 5354 mwd/mtu.

A review of the results of fuel sipping showed that out of 464 fuel assemblies (294 Gulf-United and 170 General Electric) 46 were found to contain failed fuel rods. Of these 28 were found during the unit's first 100% out-of-core sipping operations which appears to be more sensitive, by several orders of magnitude, than in-core sipping.

The breakdown of the failed assemblies by manufacturer and exposure history is as follows:

Exposure, Mwd/t	Gulf-United	General Electric
13,000 to 15,000	15	-----
15,000 to 18,000	7	7
18,000 to 21,000	11	6
	33	13

The failures appear to be randomly distributed throughout the core.

b. Bowed Fuel Channels

The check, a go-gage, of the trueness of 444 out of 464 fuel channels at the end of cycle VIII showed that 15 channels were bowed. The remaining 20 channels will be checked at a later date. The review of bowed channel core position showed the following:

(1) The southeast quadrant had 10 bowed channels or 67% of the total.

(2) The F-1 rod, which was inoperable during the cycle, had two bowed channels in its cell.

(3) Only one leaking fuel bundle was associated with a bowed channel (UN 056).

Following removal of the two bowed channels from control rod F-1 cell the rod became operational.

The licensee stated that the two bowed channels around the rod may have prevented the withdrawal of the rod. An inspection of the F-1 control rod drive is planned by the licensee.

A review of past records indicated the checks for bowed channel was initiated at the end of fuel cycle IV during which 18 channels were rejected. The other cycle records showed the following:

End of Cycle V- no channels rejected
End of Cycle VI - 6 channels rejected
End of Cycle VII - 5 channels rejected

c. Status of New Fuel

The licensee purchased 50 new fuel elements from Gulf-United to be used during the present refueling. Of these one, UN-350, was partially damaged during channeling operations. The damage consisted of a bent lower spacer band. In addition some axial scratches were noted in the fuel cladding. The licensee stated that the lower spacer was repaired by Gulf-United. The repair consisted of removing the bent section of the spacer, thus reducing its width. The depth of the clading scratches was yet to be measured. The licensee is awaiting the results of an engineering evaluation, regarding the repair of the spacer and depth of cladding scratches, before deciding whether to use the fuel element or reject it. According to the licensee the limit established for the acceptability of the cladding scratches is $\leq$ 3 mils (10% of clad thickness).

6. Power Conversion

a. Feed and Condensate

During fuel cycle VIII the following feed water heat exchanger were isolated due to tube leaks:

(1) Primary - B and C

(2) Secondary - B and C, D and E

To date two primary heaters, one drain cooler and two secondary, heat-exchangers have been retubed with stainless steel tube bundles.

Condensate and feedwater pumps vibration checks are performed periodically in accordance with procedure 3200-S-I. A review of September 1973 records showed a maximum vibration of 2 mils for a condensate pump and 0.9 mils for a feedwater pump. The licensee stated that readings are reviewed for trends and no absolute maximum has been established.

b. Level Control

Primary steam drum level and secondary steam generators level was accomplished in element control throughout the entire cycle. No problems were experienced. Shift to single element control occurred in the early years of plant operation, and according to the licensee there are no plans to return to 3- element control.

c. Condensate Demineralizers

The unit operated throughout the cycle with two 120 cu/ft beds in service and one on standby. A fourth bed charge was stored in the resin processing system. The four resin charges were cycled through the sonic cleaner every two weeks. Because of the scheduled sonic cleaning no bed reached its maximum operating P of 40 psi. One resin bed was regenerated early in the cycle.

The beds will be discharged during the current outage so fuel cycle IX will start with fresh resin charges.

7. Auxiliary Systems

a. Reactor Cleanup System

On May 23, 1973, the "B" cleanup loop was isolated because of a

malfunctioning relief valve on the regenerative heat exchanger. The flow through the valve was causing overloading of Radwaste system, also raising the temperature of the water entering the demineralizer.

The "A" cleanup loop was found to be inoperable due to pump and motor operated valves' failures. Repairs were made and the "A" loop was placed in service on June 18. On September 18, 1973, an airborne activity problem was traced to a leak in the "A" loop. The leak was determined to be in a spare instrument tap plug weld. The licensee reported the event to Directorate of Licensing by letter dated September 27, 1973.

The weld repair was completed on September 29, 1973. During the interval that neither cleanup system was available for operation, the chemistry monitoring was increased to once a shift, as was stated in the licensee's letter, with exception of one sample omitted on each of September 20 and 30. The chemistry records also showed that there was a negligible change in reactor water quality. The reactor was operating at approximately 50% thermal power at the time of the leak and only a small reduction in power was made for water quality reasons. A primary water blowdown of 20-60 gpm was maintained almost continuously during this time.

Prior to start of each fuel cycle the resin is replaced in the demineralizer columns and then resin is disposed of at the end of the cycle. Each 75 ft.3 column is charged with 1-1 ration of anion to cation resin. The flow rate through the column is approximately 200 gpm. The licensee stated that the D/P across the column is generally small, 10 psid, and the increase had been negligible during the lastest cycle.

b. Unloading Cooling System

The cooling water for the unloading system heat exchanger is now provided by the reactor enclosure cooling water system A review showed that while the system modification was completed on May 20, 1973, the system procedures were not revised until December 7, 1973. A review of the system with the licensee showed that when the unloading system is used to heat up the reactor coolant, the heating steam condensate is dumped to the service water discharge header. The inspector pointed out to the licensee that a tube leak in this mode of operation would provide a path for activity to enter the discharge canal.

A review of the reactor enclosure cooling water system showed that the

increased heat load is well within the designed capability of the system.

8. ECCS

a. Motor Operated Valve CS-16 Failure to Close

On August 7, 1973, core spray valve CS-16 failed to close during routine surveillance testing. A similar failure occurred again on August 21, 1973. The event details were reviewed and found to be as stated by the licensee in his letters to DOL dated September 5, and 18, 1973.

In that the second valve failure resulted because the maintenance department failed to take corrective measures following the first failure, the licensee was in violation of 10 CFR Part 50, Appendix B, Criterion XVI.

As noted in the licensee's letter of September 18, 1973, program to follow up all safety related work on a daily basis has been instituted. As a result this item is considered resolved and no answer to this violation is required.

Valves CS-16 and 17 are interlocked so that CS-17 cannot be opened before CS-16 is fully closed. Due to problems experienced with the interlocking system.2/ The licensee readjusted the limit switch on valve CS-16 to close while the valve is 1½ turns from its fully seated position. The inspector noted that a path between the containment atmosphere and the storm sewer exists during LOCA if CS-16 is not leak tight. The licensee stated that the M&S Engineering Department had been asked to study the desirability of adding a second isolation valve to backup CS-16, but that no plans exist to perform the job during this outage, or to include CS-16 in the sphere integrated leak rate test.

b. Inoperability of 1A Core Spray Pump

On September 28, 1973, core spray pump was declared inoperable when its packing gland started smoking during routine surveillance testing. The event details were reviewed and found to be as stated by the licensee in his letter to DOL dated October 25, 1973, with the following exceptions:

(1) Metallic packing was found to exist in all three pumps and has since being replaced.

2/ Licensee letters to DL dated 5/5/73 and 8/14/73.

(2) The pumps will not become air bound following packing failure because of the positive pressure which always exists at the pump's suction. Therefore, adequate cooling flow would be delivered to the core even if all three pumps developed packing failure.

c. Grinnell Shock Suppressors

On November 5, 1973, a letter, Worden to Keppler, was issued informing RO:III that seven Grinnell shock suppressors had been inspected and found operable.

On November 6 and 7 the vendor performed an inspection on 4 of the 7 suppressors. The vendor's report stated that the two suppressors (CSR-12 & 13) removed from the reactor canal area after 15 to 18 months operation in a radiation field and approximately 190°F temperature had functional though deteriorated "O" ring seals of millable gum polyurethane. The piston and rod packing seals made of "Parker Molythane" were found in excellent condition. The millable gum polyurethane "O" ring were replaced with one of ethylene - propylene. The two inspected suppressors outside the reactor cavity (ambient - temperature of approximately 100oF) had very little deterioration of their seals. The low oil level in the reservoir was attributed mainly to reservior seals leaking. The reservoir was theorized to have pressurized during operation. This was caused by the solid shipping plug being left on the units after installation instead of replaced with a vent plug. The licensee stated that the solid plugs have been removed and all (7) suppressors now have vent plugs installed.

RO Report 050-237/73-05, 050-249/73-06 stated SF 96-200 GE silicone fluid was being used in all shock suppressors. During the inspection and in a subsequent telephone conversation the licensee stated that this fluid is not being used. The fluid that is now being used in all suppressors is SF-1154 GE silicone fluid.

9. Other Engineered Safety Features

a. Standby Liquid Control System

(1) Technical Specification Surveillance Requirements

In accordance with existing Technical Specifications the licensee performed a boron concentration test on February 10, 1973. The average of four samples gave a sodium pentaborate concentration of 15.6 w/o which combined with the volume of

solution available exceeds the minimum boron requirements of 400 lbs. in the system.

The licensee stated that addition of boron to the system has not been required during the last few fuel cycles.

(2) Testing of Boron Injection Line

Testing to ensure that the line between the two isolation valves (AO 301 and AO 300) or immediately upstream of the first isolation valve (AO 301) is open has not been conducted yet. A modification to permit line testing without having to drain the tank has been submitted to M&S Engineering Department for approval. The licensee stated the test will be performed prior to reactor startup, as committed over a year ago, independent of whether the modification is performed or not during this outage.

10. Emergency Power

The adequacy of procedural controls to assure the availability of the diesel generator was reviewed with the licensee. The unit 1 diesel starting relay locksout only if the engine fails to start after five, 8 second, cranking attempts. This lockout requires operator reset action in the diesel engine room. The lockout condition is annunciated in the control room, and a procedure exists (6600-AN-I) which outlines the actions to be taken if the annunciator alarms. The combination of the "Auto Start Failure" and "Starting Battery Lo Voltage" annunciators, and the procedures covering each condition are considered adequate to ensure engine standby availability following manual shutdown.

11. Fuel Shipments

The licensee shipped spent fuel to Nuclear Fuel Services, New York from June 20, 1973, to October 5, 1973. A total of 27 shipments carrying 4 fuel assemblies each were made during that period using the NFS-4 casks. The inspector reviewed the records for shipments 1, 2, 6, 14, 21 and 27 and found them to meet all requirements of cask license No. SNM-984, Amendment 71-12, Docket No. 70-050. The licensee plans to resume Unit 1 spent fuel shipments of NFS during December 1973.

On September 26, 1973, the licensee received empty cask NFS-4B in noncompliance with Department of Transportation regulations Title 49 CFR 173.29(e) in that the external surface radiation dose was > 0.5 mr/hr for an empty radioactive shipping container. According to the licensee the external surface (2") dose rate measured was 270 mr/hr. This was

caused by a radioactive bolt which had slipped into the cask drain area and was not unloaded at the NFS plant. This matter has been referred to RO:I for investigation.

12. Radioactive Waste Systems

a. Liquid Waste

On November 11, 1973, the licensee accidentally discharged 627 gallons of waste water at a rate of 2 gpm which resulted in a $\beta\gamma$ concentration of 2.9×10^{-7} uCi/ml in the discharge canal for an unidentified mixture of radionuclides. The event details were reviewed during this inspection and found to be as reported by the licensee in his letter to DOL dated November 29, 1973. The discharge complied with the limits set forth in 10 CFR Part 20.

b. Off-Gas Isolation Valve

The licensee removed the off-gas isolation valve AO-347 from the off-gas line during the 1973 outage for visual inspection and to check the seating of the valve. The inspectors observed the valve during the December inspection and noted that the internal surface of the valve had a heavy coating of rust and that the valve could not be seated using approximately 200 ft. lbs. of force. After the valve was cleaned and the operator installed, the inspector observed the valve to seat, although no leak check was made at this time. The licensee plans to study the feasibility of checking the valve in place rather than removing it each shutdown to determine the valve's operability.

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A. RO Inspection Report No. 050-010/73-06

Transmittal Date : February 1, 1973

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B. RO Inquiry Report No. _____

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C. Incident Notification From: _____
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