

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/92012(DRS)

Docket No. 50-346

License No. NPF-3

Licensee: Toledo Edison Company
Edison Plaza
300 Madison Avenue
Toledo, OH 43652

Facility Name: Davis-Besse Nuclear Power Station

Inspection At: Oak Harbor, Ohio

Inspection Conducted: August 3-7, and September 29, 1992

Inspector:

Jeff A. Holmes
J. A. Holmes

October 5, 1992
Date

Approved By:

F. J. Jablonski
F. J. Jablonski, Chief
Maintenance and Outages Section

10-6-92
Date

Inspection Summary

Inspection on August 3-7, and September 29, 1992 (Report No. 50-346/92012(DRS))

Areas Inspected: Routine, unannounced inspection to follow-up on a concern and to assess implementation of the fire protection program, which included a review of administrative procedures, completed surveillances, audits, and a fire drill. The inspector utilized NRC inspection procedure modules 30703, 64704, and 92701.

Results: In general, implementation of the fire protection program was good; one Open Item was closed. Of the areas inspected, no violations were identified.

DETAILS

1. Principal Persons Contacted

Toledo Edison Company

- * C. Hawely, Operations Superintendent
- * T. Almendinger, Fire Brigade Training Instructor
- +* C. Hengge, System Engineer Supervisor
- +* M. Murtha, Senior Nuclear Engineer
- * V. Patton, Fire Protection Coordinator
- * K. Roys, Licensing Engineer
- * R. Seyferth, Supervisor, Quality Assurance Audits
- * V. Sodd, Industrial Safety Engineering Manager
- * D. Timms, System Engineer Manager
- +* D. Wuokko, Supervisor, Regulatory Affairs

U. S. Nuclear Regulatory Commission

- * W. Levis, Senior Resident Inspector
- * K. Walton, Resident Inspector

- * Denotes those attending the exit on August 7, 1992.
- + Denotes those participating in the telecon exit on September 29, 1992.

The inspector also contacted other licensee personnel during the course of the inspection.

2. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (346/87087-03): The licensee identified the need to reduce the amount of nuisance and/or spurious type fire alarms. Results of the response to the "Toledo Edison Regulatory Management System A07376 - Nuisance Alarm NRC Open Item 87-027-03" indicated the following:

The number of nuisance alarms are much less than the number of spurious alarms. The current procedure DB-FP-00018, "Control of Ignition Sources," requires the fire detection system to be "protected" (from nuisance alarms). Use of mechanical ventilators during cutting and welding reduce the effects of such activities.

The licensee determined that a significant contributor to spurious alarms was the lack of a preventive maintenance program for the computer multiplexer system. The licensee has developed a preventive maintenance program to periodically clean and align the multiplexer system.

An approved modification 91-0046 will upgrade the present fire alarm system. The upgrade will separate the fire alarm system from the security system and replace the majority of detectors and panels.

Based on the above actions this item is closed.

3. Concern (Closed) NRR-92-A-0026 and RIII-92-A-0057: Kaowool Ceramic Blanket Not Qualified as a Fire Rated Barrier to Meet Appendix R Requirements

Summary and Conclusion

The NRC received a concern that Kaowool ceramic blanket was not qualified to be used as a fire rated barrier and that the Kaowool ceramic blanket was used to protect cable trays required to meet separation requirements of 10 CFR Part 50, Appendix R. The concern was not substantiated. Kaowool ceramic blanket was not utilized for Appendix R separation requirements.

Background

The following is a discussion about Kaowool ceramic blanket in reference to 10 CFR 50, Appendix R, License Amendment 18, and Regulatory Guide 1.75. It is concluded that Kaowool ceramic blanket is used as a thermal barrier to meet Regulatory Guide 1.75, 1/2 hour fire barrier to meet License Amendment 18, and that Kaowool ceramic blanket is not utilized as a fire rated cable tray wrap to meet the separation requirements of Appendix R.

The NRC became aware of a concern that Kaowool ceramic blanket was not qualified to be used as a fire rated barrier to meet separation requirements of Appendix R. The Kaowool ceramic blanket supposedly was not subjected to either a fire endurance test or a hose stream test in accordance with NRC guidance for qualifying fire barriers; therefore the blanket should not have been used to meet Appendix R requirements.

In Inspection Report No. 50-346/90007, the NRC addressed a concern that Kaowool ceramic blanket had not been qualified by an acceptable test as a one-hour fire barrier for the configuration being used, and the fire barrier may not have been installed properly to achieve a one hour rating based on the manufacturer's own testing (one test out of four). As a result of this finding, the licensee removed the Kaowool ceramic blanket where it was used to protect safe shutdown cables to meet Appendix R requirements. This concern was not substantiated since Kaowool ceramic blanket was not used to meet the Appendix R requirements. However, it was utilized to meet the requirements of License Amendment 18 and commitments in the FSAR with respect to Regulatory Guide 1.75.

10 CFR 50, Appendix R

10 CFR 50, Appendix R, is required to be met for fire protection of safe shutdown capability. Where cables or equipment are located within the same fire area outside of primary containment the following requirements apply:

Section III.G.2.a - "Separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating", and/or

Section III.G.2.c - "Enclosure of cables and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating."

The licensee does not utilize Kaowool ceramic blanket to meet the requirements of Appendix R. The licensee has removed Kaowool ceramic blanket and installed Thermo-Lag for circuits required for Appendix R. In Unresolved Item 346/83-16-12, the NRC identified that Kaowool ceramic blanket was not qualified by an acceptable test as a one-hour fire rated barrier.

The licensee responded to the unresolved item in "Toledo Edison Company, Davis-Besse Nuclear Power Station, Unit No. 1, Fire Protection Activities Summary, September 3, 1985." The response stated that ". . . , Toledo Edison has reassessed the use of Kaowool ceramic blanket as its one-hour fire barrier wrap material. While it is TED's (sic) position that the adequacy of the design configuration in supporting Kaowool as an acceptable one-hour wrap is established, TED engineering has decided to install new one-hour barriers (Thermo-Lag), and to replace existing wraps required to provide protection to the requirements of Appendix R utilizing a wrap material and installation configuration receiving full NRC acceptability."

Unresolved item 346/83-16-12 was closed out in NRC Inspection Report 50-346/90007. The report indicated that the licensee affirmed that Thermo-Lag fire barrier wrap, which replaced the previous material, met the acceptance criteria of the standard fire test method of ASTM E-119. During inspection 50-346/90007, an inspector confirmed that certain fire barrier wrap materials had been installed as required. Therefore, it was concluded that Kaowool ceramic blanket, which was used to protect safe shutdown equipment identified to meet Appendix R requirements, was replaced by Thermo-Lag.

NOTE:

Bulletin 92-01: "Failure of Thermo-Lag 330 Fire Barrier System to Maintain Cabling in Wide Cable Trays and Small Conduits Free From Fire Damage," dated June 24, 1992, describes potential problems with the installation of Thermo-Lag materials. In the original

response letter, serial number 2076, the licensee did not declare the Thermo-Lag 330 fire barriers inoperable based on incorrect interpretation of Generic Letter 86-10. The licensee amended their response and implemented appropriate compensatory measures. NRC will review Thermo-Lag issues during a follow-up inspection of Bulletin 92-01.

License Amendment 18

License Amendment No. 18 dated July 26, 1979, required the licensee to complete the modifications identified in Section 1 of the NRC's Fire Protection Safety Evaluation Report (SER) dated July 26, 1979. This included the installation of Kaowool ceramic blanket, a 1/2 hour fire rated barrier around power and control circuits for several pieces of equipment.

To comply, the licensee installed Kaowool ceramic blanket which, the NRC accepted in the 1979 SER. However, Kaowool ceramic blanket has not been approved by a national recognized testing laboratory as a fire rated barrier. Tests have been performed that demonstrate its capabilities to act as a fire barrier; however, the material has not been listed as a fire rated barrier. The Kaowool ceramic blanket was removed and replaced with Thermo-lag in areas required for Appendix R [See Note above.] The remaining Kaowool ceramic blanket was maintained in place to meet License Amendment 18 and Regulatory Guide 1.75.

Based on results of the licensee's review of Generic letters 86-10 and 88-12, the licensee submitted an application to remove the Fire Protection Program requirements for maintaining the Kaowool ceramic blanket based on operating license Condition 2.C.(4) (Amendment 18), which specified certain areas of the plant where Kaowool ceramic blanket was installed. The licensee is awaiting response from the NRC that would relieve them of the requirement for maintaining Kaowool ceramic blanket as part of the accepted fire protection program.

Regulatory Guide 1.75

Regulatory Guide 1.75 sets forth the requirements for maintaining the physical independence of electric systems. In FSAR Chapter 8, it is stated that "During the design phase of Davis-Besse Unit 1, complete adherence to the (February 1974) Regulatory Guide 1.75 "Physical Independence of Electric Systems" was not possible since plant design pre-dated the issuance of 1.75 as well as IEEE 384-1974. However, the independence principles followed in the design are considered adequate to preclude a common mode failure for any design basis event and do, in fact, represent partial conformance." The licensee describes in Chapter 8.3.1.2.20 of the FSAR the areas where Kaowool ceramic blanket will be maintained to meet the minimum cable separation requirements. The SER dated December 1976, and April 1977 discussed the use of

Kaowool ceramic blanket to provide a thermal barrier, not a fire rated barrier, between redundant Class 1E cables. Therefore, Kaowool ceramic blanket is installed in many areas of the plant to meet FSAR commitments.

The SER indicated that the licensee would provide Kaowool ceramic blankets on all open type trays to provide separation between redundant Class 1E cables - as described in section 7.9.2.2. The licensee has installed Kaowool ceramic blankets and therefore has met the requirements of Regulatory Guide 1.75. The Kaowool ceramic blankets, are used in these cases as thermal shields and not as fire rated barriers.

4. Routine Fire Protection Program Review

This inspection consisted of a review of administrative procedures, completed fire protection surveillances, fire protection audits, and observation of a fire drill.

4.1 Fire Protection Organization

Procedure N²-EN-00302, "Fire Protection Program," Revision 00, was developed to establish the organization and personnel responsibilities for the fire protection program at the site. The inspector reviewed the responsibilities and qualifications for the fire protection engineer, fire coordinator and the fire brigade training instructor. In all cases, the individuals' training and experience were commensurate with the position. No unacceptable items were identified.

4.2 Administrative Procedures

4.2.1 Control of Transient Combustibles and Flammable/Combustible Liquids

Procedure DB-FP-00007, "Control of Transient Combustibles," Revision 2, was developed to control transient combustibles, and flammable/combustible liquids. The inspector reviewed the procedure for unacceptable storage that would pose a significant threat to redundant safe shutdown equipment as required by 10 CFR 50 Appendix R. No unacceptable items were identified.

4.2.2 Cutting and Welding Procedures

Procedure DB-FP-00018, "Control of Ignition Sources," Revision 00, was developed to control the use of ignition sources, such as, welding, brazing and cutting by use of a burn permit. The inspector reviewed the procedure for unacceptable practices. No unacceptable items were identified.

4.3 Fire Protection Surveillance

The inspector reviewed a sample of surveillance procedures to assure that equipment was maintained and operable as required by the fire protection program. No unacceptable items were observed. The procedures are listed below:

T365-11, "Post Winter Hydrant Check," Revision 11; dated May 17, 1991.

DB-MI-03814, "Channel Functional Test of Accessible Detectors and Supervisory Circuits for panel C6713," Revision 0; dated July 8, 1990, November 26, 1990, March 27, 1991, October 12, 1991, and March 19, 1992.

DB-MI-03815, "Channel Functional Test of Accessible Detectors and Supervisory Circuits for Panel C1720," Revision 00; dated July 16, 1990, November 27, 1990, June 13, 1990, December 17, 1990, May 26, 1992.

DB-MI-03817, "Channel Functional Test of Accessible Detectors and Supervisory Circuits for Panel C3520," Revision 00; dated June 23, 1990, December 19, 1990, and June 27, 1991.

DB-FP-04041 "Startup Transformer 01 Deluge Test," Revision 00; dated April 28, 1990, May 9, 1991, and June 10, 1992.

DB-FP-04042 "Startup Transformer 02 Deluge Test," Revision 1; dated May 1, 1990, May 10, 1991, and June 3, 1992.

DB-FP-04045 "Main Transformer 01 Deluge Test," Revision 00; dated April 28, 1990 and October 13, 1991.

DB-FP-04046 "Auxiliary Transformer 11 Deluge Test," Revision 00; dated April 28, 1990 and October 13, 1991.

4.4 Fire Protection Audits

Technical Specification 6.5.2.8.h required an audit of the fire protection program and implementing procedures at least once per 24 months. The biennial audits dated October 20, 1989, and September 19, 1991, included findings and observations that were either addressed or were scheduled to be addressed by the licensee's staff. No unacceptable resolutions were identified.

Technical Specification 6.5.2.8.i required an inspection and audit of the fire protection and loss prevention program inspection be performed by either qualified off-site licensee personnel or an outside fire protection firm at least once per 12 months. The annual audits dated September 14, 1989,

September 19, 1990 and November 5, 1991, included findings and observations that were either addressed or were scheduled to be addressed by the licensee's staff. No unacceptable resolutions were identified.

Technical Specification 6.5.2.8.j required an inspection and audit of the fire protection and loss prevention program to be performed by a qualified outside independent fire protection consultant at least once every 36 months. The triennial audit of November 5, 1991, included findings and observations that were brought to management's attention, and were resolved or scheduled to be resolved by the licensee. No unacceptable resolutions were identified.

4.5 Inoperable Fire Detectors Inside Containment

NRC Inspection Report 50-346/91016, section 4.b.(3) questioned the conservatism of having an inoperable fire detection zone (FDZ) in an inaccessible area for a full fuel cycle. The licensee indicated that the FDZ 410 was inoperable before the installation of the temporary modification (TM-910043).

During this inspection, the inspector reviewed the 10 CFR 50.59 safety evaluation for TM 91-0043 to fire detection panels C-4720A & C, which specified the following:

The modification "jumpered out" zone FDZ-410, to preserve the alarming ability to the control room for all other zones associated with panels C-4720A & C (The function of fire detection panels C-4720A & C is to power fire detectors and to provide fire alarms and trouble alarms to the control room.)

Technical specification compensatory measures require an hourly roving fire watch for containment rooms when the area is in an accessible state. The appropriate compensatory measures will be in effect until the zones on the panels are operable.

The installation of jumpers will not degrade the balance of the fire protection system or create any adverse environment for any plant system so an accident of a different type than analyzed in the USAR will not be created.

The inspector also reviewed the fixed combustible loading in the area and whether redundant equipment required for Appendix "R" requirements would be affected by lack of detection in FDZ 410. The lack of fire detection in FDZ 410 did not appear to violate any Appendix "R" requirements for FDZ 410. There did not appear to be a significant safety issue or violation of a legal requirement. The licensee initiated compensatory measures, which required an hourly fire watch when containment is accessible.

The "Special Report Pursuant to Technical Specification 3.3.3.8, Fire Detection Instrumentation," dated December 6, 1991, indicated that the fire detection system (including FDZ 410) would be upgraded tentatively in the spring of 1993. Based on the licensee's actions and future modifications this item is closed.

4.6 Fire Drill

On August 5, 1992, a fire drill was conducted that simulated an oil fire at the hydrogen seal oil unit. The fire drill postulated an oil leak from the hydrogen seal oil unit, with the associated sprinkler system out-of-service.

The fire brigade responded in a timely manner with full turn out gear, including SCBAs. The fire brigade leader utilized the pre-fire plans and was effective in coordinating the brigade members and coordinating with the control room operators. The brigade members also performed well in their duties of attacking the fire.

The critique that followed the fire drill was good in that it covered key objectives, improved/alternative ways to address problems encountered in the fire scenario and allowed feed back from the participants. No unacceptable items were identified.

4.7 Fire Reports

The inspector reviewed the fire reports for 1989, 1990 and 1991. The types of fires that occurred consisted of an overheated trip coil, trash can fire, diesel fire pump exhaust insulation, part washer motor shorted out, combustibles ignited from cutting and welding activities, and two transformer fires that were apparently unrelated. The majority of the fires were smoldering type fires and were detected and controlled/extinguished in the initial stages. No unacceptable items were identified.

4.8 Plant Observations

The inspector observed several areas located in the auxiliary, reactor, and turbine buildings that included several hose stations, extinguishers, sprinkler valves, and emergency lights. The inspector concluded that the equipment was well maintained and that the housekeeping in these areas was good.

5.0 Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on August 7, 1992, and summarized the scope and findings of the inspection. Also, on September 29, 1992, a telephone call was made between the licensee's representatives and the inspector. The likely informational content of the inspection report was discussed with regard to documents reviewed during the inspection. The licensee did not identify any of the documents as proprietary.

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