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JAN 11 1979

Docket Nos. ~~50-10~~
and 50-237

Mr. Cordell Reed
Assistant Vice President
Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690

Dear Mr. Reed:

Enclosed are copies of our draft evaluation of two Systematic Evaluation Program topics. You are requested to examine the facts upon which the staff has based its evaluation and respond either by confirming that the facts are correct, or by identifying any errors. If in error, please supply corrected information for the docket. We encourage you to supply for the docket any other material related to these topics that might affect the staff's evaluation.

It would be most helpful if your comments were received within 30 days of the date you receive this letter.

Sincerely,

Original Signed by:
Dennis L. Ziemann

Dennis L. Ziemann, Chief
Operating Reactors Branch #2
Division of Operating Reactors

Enclosures:
Topics V-10.A
VIII-3.A

cc w/enclosures:
See next page

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cc
Mr. John W. Rowe
Isham, Lincoln & Beale
Counselors at Law
One First National Plaza, 42nd Floor
Chicago, Illinois 60603

Mr. B. B. Stephenson
Plant Superintendent
Dresden Nuclear Power Station
Rural Route #1
Morris, Illinois 60450

Anthony Z. Roisman
Natural Resources Defense Council
917 15th Street, N. W.
Washington, D. C. 20005

Morris Public Library
604 Liberty Street
Morris, Illinois 60451

U. S. Nuclear Regulatory Commission
ATTN: Jimmy L. Barker
Post Office Box 706
Morris, Illinois 60450

Susan N. Sekuler
Assistant Attorney General
Environmental Control Division
188 W. Randolph Street
Suite 2315
Chicago, Illinois 60601

K M C Inc.
ATTN: Mr. Jack McEwen
1747 Pennsylvania Avenue, N. W.
Suite 1050
Washington, D. C. 20006

SYSTEMATIC EVALUATION PROGRAM

PLANT SYSTEMS/MATERIALS

DRESDEN UNIT NO. 1

Topic V-10.A Residual Heat Removal System Heat Exchanger Tube Failures

The safety objective of this review is to assure that impurities from the cooling water system are not introduced into the primary coolant in the event of unloading heat exchanger tube failure. This was expanded to assure that adequate monitoring exists to assure no leakage of radioactive material in the other direction - into the service water and thus to the environment.

Information for this assessment was gathered from plant personnel during the safe shutdown review site visit and from related telephone conversations. Information was also taken from Dresden Unit No. 1 system drawings and the Dresden Unit No. 1 Technical Specifications.

The bases for the review of these cooling systems on today's plants include: (1) the NRC's Standard Review Plan (SRP) 9.2.1 which requires that the service water system include the capability for detection and control of radioactive leakage into and out of the system and prevention of accidental releases to the environment; (2) SRP 9.2.2, which requires that auxiliary cooling water systems (such as the unloading heat exchanger system) include provisions for detection, collection and control of system leakage and means to detect leakage of activity from one system to another and preclude its release to the environment; and

(3) SRP 5.2.3, which discusses compatibility of materials with reactor coolant and requires monitoring and sampling of the primary coolant system. These Standard Review Plans were used only in the comparison of Dresden Unit No. 1 against today's criteria and were not used as licensing requirements which must be met, especially if the plant incorporates other equally viable means of accomplishing the stated goals.

Reactor cooling during shutdown conditions is accomplished by the use of the two reactor unloading heat exchangers. These heat exchangers operate at a minimum pressure of 50 psig and in turn are cooled by the reactor enclosure cooling water system. Reactor enclosure cooling water system pressure at these heat exchangers varies between 85 and 90 psig, so there exists the possiblity that leakage from the reactor enclosure cooling water system into the reactor could occur. Also, at higher reactor unloading system pressures, leakage from the primary system to the reactor enclosure cooling water system could occur. Both of the above scenarios assume, of course, that tubing has failed in one (or both) of the reactor unloading heat exchangers.

The reactor enclosure cooling water system, which cools other primary system components in addition to the unloading heat exchangers, is itself cooled by the service water system (the ultimate heat sink). The reactor enclosure cooling water system pressure at the three reactor enclosure cooling water heat exchangers is approximately 80 psig, while service water pressure at these heat exchangers is approximately 40 psig. Thus, if leakage were to occur, it would pass to the environment. In the highly unlikely case of simultaneous undetected leakage from a combination of either of the unloading heat exchangers (or any other primary component cooled by the reactor enclosure cooling water system) and any of the reactor enclosure cooling water heat exchangers, radioactivity could be discharged to the environment.

As protection against this occurrence,both the reactor enclosure cooling water system and the service water system include radiation monitors and alarms to alert the operators to leakage.

The sphere cooling water head tank, which serves as the surge tank for the reactor enclosure cooling water system, is instrumented with high and low level alarms to warn the operators of leakage either into or out of the system.

As another means of detecting any leakage between systems, Dresden Unit No. 1 procedures require twice per-week sampling of pH, chloride, activity, and nitrites (a compound of which is used as a corrosion inhibitor) on the reactor enclosure cooling water system.

As additional protection against undetected leakage into the primary system from the reactor enclosure cooling water system, the reactor coolant system incorporates a continuous conductivity monitor. Also, Dresden Unit No. 1 Technical Specifications 3.6 and 4.6 establish coolant chemistry limits on, and sampling requirements for, conductivity and chloride content. Although monitoring for these parameters is required during "steaming" operation at 96 hour intervals, this is modified such that: during startup a sample is required every four hours; a sample is taken when the conductivity monitor indicates abnormal conductivity; and if the continuous conductivity monitor is inoperable, a sample shall be taken and analyzed daily.

In addition to the technical specification requirements, Dresden Unit No. 1 plant procedures require sampling of pH, conductivity, chlorides, activity, suspended solids, and silica once per day on reactor water whether the plant is operating or not.

We are satisfied that the chances of radioactive leakage to the environment are minimized by the design of the two cooling water systems and the included radioactivity monitors. We are also satisfied that, because of system design, technical specifications, and plant procedures, there is little chance of undetected leakage into the primary system. We have therefore concluded that Dresden Unit No. 1 satisfies present requirements and that resolution of this topic is complete.

SYSTEMATIC EVALUATION PROGRAM

BATTERY CAPACITY TESTS

DRESDEN UNIT 1

DOCKET NO: 50-10

Topic VIII-3.A Station Battery Test Requirements

The objective of this review is to assure that the onsite Class IE battery capacity to supply all safety related D-C loads is verified by periodic testing.

The testing should be in accordance with IEEE Standard 450-1975, IEEE Standard 308-1974, BTP EICSB 6 and the "Standard Technical Specifications for General Electric Boiling Water Reactors" (NUREG-0123). The required tests are as follows:

1. At least once per 18 months, during shutdown, a battery service test should be performed to verify that the battery capacity is adequate to supply and maintain in operable status all of the actual emergency loads for 2 hours.

2. At least once per 60 months, during shutdown, a battery discharge test should be performed to verify that the battery capacity is at least 80% of the manufacturer's rating.

The Dresden Unit 1 Nuclear Station battery surveillance requirements are included in Section 4.9 of the station technical specifications. These specifications require a battery rated load discharge test at each refueling outage; however, they do not require a battery service test. Therefore, the Dresden Unit 1 Nuclear Station deviates from current licensing requirements in that its technical specifications do not require a battery service test and these specifications do not indicate that the battery rated load discharge test verifies that the battery capacity is at least 80% of the manufacturers rating.

This deviation will be evaluated in the context of the Design Basis Events (DBE) that rely upon these components for mitigating the consequences of the DBE. If this deviation is determined to be unacceptable, the Technical Specifications will be appropriately revised.

References

1. "Dresden Unit 1 Technical Specifications", Commonwealth Edison Company.

2. Standard Review Plan, Appendix 7-A, BTP EICSB 6, "Capacity Test Requirements of Station Batteries - Technical Specifications", U. S. Nuclear Regulatory Commission.

3. "IEEE Standard Criteria for Class IE Power Systems for Nuclear Power Generating Stations", Std. No. 308-1974, The Institute of Electrical and Electronics Engineers, Inc.

4. "IEEE Recommended Practice for Maintenance, Testing and Replacement of Large Lead Storage Batteries for Std. No. 450-1975, The Institute of Electrical and Electronics Engineers, Inc.

5. "Standard Technical Specifications for General Electric Boiling Water Reactors", NUREG-0123, U. S. Nuclear Regulatory Commission.

SYSTEMATIC EVALUATION PROGRAM

PLANT SYSTEMS/MATERIALS

DRESDEN UNIT NO. 2

Topic V-10.A Residual Heat Removal System Heat Exchanger Tube Failures

The safety objective of this review is to assure that impurities from the cooling water system are not introduced into the primary coolant in the event of shutdown cooling system heat exchanger tube failure. This was expanded to assure that adequate monitoring exists to assure no leakage of radioactive material in the other direction - into the service water and thus to the environment.

Information for this assessment was gathered from plant personnel during the safe shutdown review site visit and from related telephone conversations. Information was also taken from Dresden 2 system drawings and the Dresden 2 Technical Specifications.

The bases for the review of these cooling systems on today's plants include: (1) the NRC's Standard Review Plan (SRP) 9.2.1, which requires that the service water system include the capability for detection and control of radioactive leakage into and out of the system and prevention of accidental releases to the environment; (2) SRP 9.2.2, which requires that auxiliary cooling water systems (such as the shutdown cooling system) include provisions for detection, collection and control of system leakage and means to detect leakage of activity from one system to another and preclude its release to the environment; and (3) SRP 5.2.3, which discusses compatibility of materials with reactor coolant and requires monitoring and sampling of the primary coolant system. These Standard Review Plans were used only in the comparison of Dresden 2 against today's criteria and were not used as licensing requirements which must be met, especially if the plant incorporates other equally viable means of accomplishing the stated goals.

The three shutdown cooling system (SCS) heat exchangers at Dresden 2 are designed for full reactor pressure (1250 psig) but operate at a minimum reactor coolant pressure of approximately 100 psig, while the secondary [cooling water from the Reactor Building Closed Cooling Water (RBCCW) System] side operates at approximately 60 psig. Thus, normally, leakage will be from the SCS to the RBCCW system. An exception to this will be noted below.

The three RBCCW heat exchangers normally operate with an RBCCW pressure of 50 psig. Their secondary side is cooled by service water, the ultimate heat sink, which operates at pressures ranging between 90 and 100 psig at these heat exchangers. Thus, leakage to the environment is prevented. However, to further protect the environment against the discharge of radiation, the Dresden 2 service water system includes a radiation monitor on the system discharge.

Since the RBCCW system will normally receive the inleakage from both the SCS and service water systems, the system has features which warn the operators of such leakage. The surge tank of the RBCCW system has high and low level alarms which will alert the operators to leakage into or out of the system. There is also a radiation monitor to signal any radioactive inleakage, either from the SCS or from any other primary system component cooled by the RBCCW system. As another means of detecting leakage, Dresden 2 plant procedures require the weekly sampling of the RBCCW system. This sample includes pH, chloride, activity and nitrates (a compound of which is used for corrosion inhibition).

An exception to the normal leakage direction (assuming tube leakage) of water from the primary to the RBCCW system would be in the case of shutting down the SCS after its use. During this period of time, RBCCW is left in service, in accordance with the applicable plant procedure, until the SCS heat exchangers are well below 212°F. As a result, there is an opportunity for leakage of RBCCW into the SCS if any SCS heat exchanger tubes are leaking. However, the SCS is isolated from the reactor coolant loop except for a short period of time, and leakage through the SCS valves would be required in addition to the leaking tubes in order for there to be any substantial leakage into the reactor coolant system. Additionally, Dresden 2 procedures require daily sampling of reactor coolant whether the plant is at power or not, and such sampling (for suspended solids, silica, pH, conductivity, chloride and activity) will detect any impurities not already removed by the reactor water cleanup system. More defense is provided by Dresden 2 Technical Specifications 3.6.C and 4.6.C, which establish limits and sampling frequencies for conductivity and chlorides. One of these requirements is that, during startup, a sample of reactor coolant shall be taken every four hours and analyzed for conductivity and chloride.

The Dresden 2 reactor coolant system also includes a continuous conductivity monitor which serves to alert the operators to inleakage from SCS or to breakthrough of any of the feedwater system ion exchangers.

We are satisfied that the chances of radioactive leakage to the environment are minimized by the design of the cooling water systems and the included radioactive monitors.

We are also satisfied that the SCS design, with the associated procedures, technical specifications and monitors, will minimize the chances of undetected leakage into the primary system. We conclude that Dresden Unit No. 2 satisfies present requirements and that resolution of this topic is complete.

SYSTEMATIC EVALUATION PROGRAM

BATTERY CAPACITY TESTS

DRESDEN UNIT 2

DOCKET NO: 50-237

Topic VIII-3.A Station Battery Test Requirements

The objective of this review is to assure that the onsite Class IE battery capacity to supply all safety related D-C loads is verified by periodic testing.

The testing should be in accordance with IEEE Standard 450-1975, IEEE Standard 308-1974, BTP EICSB 6 and the "Standard Technical Specifications for General Electric Boiling Water Reactors" (NUREG-0123). The required tests are as follows:

1. At least once per 18 months, during shutdown, a battery service test should be performed to verify that the battery capacity is adequate to supply and maintain in operable status all of the actual emergency loads for 2 hours.

2. At least once per 60 months, during shutdown, a battery discharge test should be performed to verify that the battery capacity is at least 80% of the manufacturer's rating.

The Dresden Unit 2 Nuclear Station battery surveillance requirements are included in Section 4.9 of the station technical specifications. These specifications require a battery rated load discharge test at each refueling outage; however, they do not require a battery service test. Therefore, the Dresden Unit 2 Nuclear Station deviates from current licensing requirements in that its technical specifications do not require a battery service test and these specifications do not indicate that the battery rated load discharge test verifies that the battery capacity is at least 80% of the manufacturers rating.

This deviation will be evaluated in the context of the Design Basis Events (DBE) that rely upon these components for mitigating the consequences of the DBE. If this deviation is determined to be unacceptable, the Technical Specifications will be appropriately revised.

References

1. "Dresden Unit 2 Technical Specifications", Commonwealth Edison Company.

2. Standard Review Plan, Appendix 7-A, BTP EICSB 6, "Capacity Test Requirements of Station Batteries - Technical Specifications", U. S. Nuclear Regulatory Commission.

3. "IEEE Standard Criteria for Class IE Power Systems for Nuclear Power Generating Stations", Std. No. 308-1974, The Institute of Electrical and Electronics Engineers, Inc.

4. "IEEE Recommended Practice for Maintenance, Testing and Replacement of Large Lead Storage Batteries for Std. No. 450-1975, The Institute of Electrical and Electronics Engineers, Inc.

5. "Standard Technical Specifications for General Electric Boiling Water Reactors", NUREG-0123, U. S. Nuclear Regulatory Commission.