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U.S. ATOMIC ENERGY COMMISSION
Regulatory
Mail Section

September 21, 1973

Mr. J. F. O'Leary, Director
Directorate of Licensing
Office of Regulation
U.S. Atomic Energy Commission
Washington, D.C. 20545

Regulatory File Cy.

Subject: Dresden Station, Unit 3, Proposed Changes to Appendix A to DPR-25, AEC Dkt 50-249

Dear Mr. O'Leary:

Pursuant to Section 50.59 of 10 CFR 50 and Paragraph 3.B of Facility Operating License DPR-25, Commonwealth Edison Company proposes a change to Appendix A of DPR-25, Dresden Unit 3. The purpose of this change is to incorporate additional Technical Specification requirements for surveillance of the Drywell-Pressure Suppression Chamber Vacuum Breakers.

The proposed change includes Limiting Conditions of Operation, Surveillance Requirements and the appropriate Bases for the vacuum breakers to ensure primary containment safety margins are maintained. Further justification for this change is provided in Dresden Special Report No. 23 and 23A, submitted to the AEC April 23, 1973 and August 1, 1973 respectively.

The proposed Technical Specification change is incorporated in the revised Technical Specification pages 116, 116A, 116B, 117, 127, 127A, 131, and 131A which are attached. This proposed change is similar to that tentatively proposed in Dresden Special Report No. 23.

This change has been reviewed and approved by the Dresden Station Review Board and the Commonwealth Edison Nuclear Review Board.

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Three (3) signed originals and 37 copies of this proposed change are submitted for your approval.

Very truly yours,

J S Abel for

Byron Lee, Jr.
Vice-President

SUBSCRIBED and SWORN to before me this 21st day of September, 1973.

Brenda Pammel
Notary Public

My Commission Expires August 29, 1977

3.7 LIMITING CONDITION FOR OPERATION	4.7 SURVEILLANCE REQUIREMENT

3. Pressure Suppression Chamber — Reactor Building Vacuum Breakers

   a. Except as specified in 3.7.A.3.b below, two pressure suppression chamber-reactor building vacuum breakers shall be operable at all times when the primary containment integrity is required. The setpoint of the differential pressure instrumentation which actuates the pressure suppression chamber-reactor building vacuum breakers shall be 0.5 psi.

   b. From and after the date that one of the pressure suppression chamber-reactor building vacuum breakers is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding seven days unless such vacuum breaker is sooner made operable, provided that the procedure does not violate primary containment integrity.

3. Pressure Suppression Chamber — Reactor Building Vacuum Breakers

   a. The pressure suppression chamber-reactor building vacuum breakers and associated instrumentation including setpoint shall be checked for proper operation every three months.

3.7 LIMITING CONDITION FOR OPERATION	4.7 SURVEILLANCE REQUIREMENT
4. Dyrwell-Pressure Suppression Chamber Vacuum Breakers	4. Drywell-Pressure Suppression Chamber Vacuum Breakers
a. When primary containment is required, at least nine of the twelve operable drywell-pressure suppression chamber vacuum breakers shall be positioned in the closed position within 1/8" off the seat at the bottom of the vacuum breaker as indicated by the position indication system and alarm except during testing.	a. Each drywell-pressure suppression vacuum breaker shall be exercised through an opening-closing cycle monthly and immediately following termination of the discharge of steam from any source to the suppression chamber.
b. Any inoperable drywell-suppression chamber vacuum breakers must be secured in the closed position.	b. The dyrwell-pressure suppression chamber vacuum breakers shall be inspected and tested for proper operation during each refueling outage.
c. At each refueling outage a leakage test shall be performed to verify that with an initial drywell to suppression chamber differential pressure of at least 1 psi, and drywell pressure then held constant,	c. A leak test of the drywell to suppression chamber structure shall be conducted during each refueling outage.

3.7 LIMITING CONDITION FOR OPERATION	4.7 SURVEILLANCE REQUIREMENT
the suppression chamber pressure will not increase due to vacuum breaker leakage by more than 0.25 inches of water/minute over a 10-minute period. d. If Specifications 3.7.A.4.a or b cannot be met, the situation shall be corrected within 24 hours or the reactor will be placed in a cold shutdown condition within the subsequent 24 hour period.	

3.7 LIMITING CONDITION FOR OPERATION

5. Oxygen Concentration

   a. After completion of the startup test program and demonstration of plant electrical output, the primary containment atmosphere shall be reduced to less than 5% oxygen with nitrogen gas during reactor power operation with reactor coolant pressure above 90 psig, except as specified in 3.7.A.5.b.

   b. Within the 24-hour period subsequent to placing the reactor in the Run mode following a shutdown, the containment atmosphere oxygen concentration shall be reduced to less than 5% by weight, and maintained in this condition. Deinerting may commence 24 hours prior to a shutdown.

6. If the specifications of 3.7.A cannot be met, an orderly shutdown shall be initiated and the reactor shall be in a Cold Shutdown condition within 24 hours.

4.7 SURVEILLANCE REQUIREMENT

5. Oxygen Concentration

   The primary containment oxygen concentration shall be measured and recorded on a weekly basis.

concentration in the containment. Subsequent ignition of the hydrogen if it is present in sufficient quantities to result in excessively rapid recombination, could result in a loss of containment integrity.

The 5% oxygen concentration minimizes the possibility of hydrogen combustion following a loss of coolant accident. Significant quantities of hydrogen could be generated if the core cooling systems did not sufficiently cool the core.

The occurrence of primary system leakage following a major refueling outage or other scheduled shutdown is much more probable than the occurrence of the loss of coolant accident upon which the specified oxygen concentration limit is based. Permitting access to the drywell for leak inspections during a startup is judged prudent in terms of the added plant safety offered without significantly reducing the margin of safety. Thus, to preclude the possibility of starting the reactor and operating for extended periods of time with significant leaks in the primary system, leak inspections are scheduled during startup periods, when the primary system is at or near rated operating temperature and pressure. The 24-hour period to provide inerting is judged to be sufficient to perform the leak inspection and establish the required oxygen concentration. The primary containment is normally slightly pressurized during periods of reactor operation. Nitrogen used for inerting could leak out of the containment but air could not leak in to increase oxygen concentration. Once the containment is filled with nitrogen to the required concentration, no monitoring of oxygen concentration is necessary. However, at least once a week the oxygen concentration will be determined as added assurance.

Operability of a drywell-suppression chamber vacuum breaker valve and the associated indicating and alarm circuits shall be established by manually cycling the valve.

The capacity of the twelve drywell vacuum relief valves are sized to limit the pressure differential between the suppression chamber and drywell during post-accident drywell cooling operations to the design limit of 2 psig. They are sized on the basis of the Bodega Bay pressure suppression system tests. The ASME Boiler and Pressure Vessel Code, Section III, Subsection B, for this vessel allows a 5 psig vacuum; therefore, with three vacuum relief valves secured in the closed position and nine operable valves, containment integrity is not impaired.

During each refueling outage, with a differential pressure of greater than 1 psi, and drywell pressure then held constant, the rate of change to the suppression chamber pressure due to vacuum breaker leakage must not exceed 0.25 inches of water per minute as measured over a 10-minute period. In the event the rate of change exceeds this value, the source of leakage will be identified and eliminated before power operation is resumed.

B. Standby Gas Treatment System and C Secondary Containment — The secondary containment is designed to minimize any ground level release of radioactive materials which might result from a serious accident. The reactor building provides secondary containment during reactor operation, when the drywell is sealed and in service; the reactor building provides primary containment when the reactor is shutdown and the drywell is open, as during refueling. Because the secondary containment is an integral part of the complete containment system, secondary containment is required at all times that primary containment is required as well as during refueling.

The standby gas treatment system is designed to filter and exhaust the reactor building atmosphere to the stack during secondary containment isolation conditions, with a minimum release of radioactive materials from the reactor building to the environs. One standby gas treatment fan is designed to automatically start upon containment isolation and to maintain the reactor building pressure to approximately a negative 1/4-inch water gauge pressure; all leakage should be in-leakage. Should the fan fail to start, the redundant alternate fan and filter system is designed to start automatically. Each of the two fans has 200% capacity. Ref. Section 5.3.2 SAR. If one standby gas treatment system circuit is inoperable, the other circuit must be tested daily. This substantiates the availability of the operable circuit and results in no added risk; thus, reactor operation or refueling operation can continue. If neither circuit is operable, the plant is brought to a condition where the system is not required.

While only a small amount of particulates are released from the pressure suppression chamber system as a result of the loss of coolant accident, high-efficiency particulate filters before and after the charcoal filters are specified to minimize potential particulate release to the environment and to prevent clogging of iodine filters. The high-efficiency filters have an efficiency greater than 99% for particulate matter larger than 0.3 micron. The minimum iodine removal efficiency is 99%. Filter banks will be replaced whenever significant changes in filter efficiency occur. Tests (11) of impregnated charcoal identical to that used in the filters indicated that shelf life up to five years leads to only minor decreases in methyl iodine removal efficiency.

The efficiency of 99% of the charcoal and particulate filters is sufficient to prevent exceeding 10 CFR 100 guidelines for the accidents analyzed. The analysis of the loss of coolant accident assumed a charcoal filter efficiency of 90%, a particulate filter efficiency of 95%, and TID 14844 fission product source term. Hence, requiring 99% efficiency for both the charcoal and particulate filters provides adequate margin. A 10 Kw heater maintains relative humidity below 70% in order to assure the efficient removal of methyl iodine on the impregnated charcoal filters.

D. Primary Containment Isolation Valves — Double isolation valves are provided on lines penetrating the primary containment and open to the free space of the containment. Closure of one of the valves in each line would be sufficient to maintain the integrity of the pressure suppression system. Automatic initiation is required to minimize the potential leakage paths from the containment in the event of a loss of coolant accident.

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(11) "Nuclear Safety Program Annual Progress Report for Period Ending December 31, 1966, ORNL-4071.

SAR indicates that fission products would not be released directly to the environs because of leakage from the main steam line isolation valves due to holdup in the steam system complex. Although this effect would indicate that an adequate margin exists with regard to the release of fission products, a program will be undertaken to further reduce the potential for such leakage to bypass the standby gas treatment system.

Monitoring the nitrogen makeup requirements of the inerting system provides a method of observing leak rate trends and would detect gross leaks in a very short time. This equipment must be periodically removed from service for test and maintenance, but this out-of-service time will be kept to a practical minimum.

Each drywell-suppression chamber vacuum breaker is equipped with two independent switches to indicate the opening of the valve disc in excess of one-sixteenth of an inch at all points around the circumference of the valve disc or one-eighth of an inch (1/8") at the bottom of the disc when the top of the disc is on its seat. The physical characteristics of the valve and mounting of the limit switches permits one setting of the limit switches to equally satisfy either of the above criteria. Redundant control room alarms are provided to permit instant detection of any drywell-suppression chamber vacuum breaker open in excess of the above described allowable limits. The containment design has been examined to establish the allowable bypass area between the drywell and suppression chamber as 0.13 $ft.^2$. This translates into an equal opening of one-sixteenth inch (1/16") at all points around the circumference of the disc for all twelve valves.

During each refueling outage, a leak rate test shall be performed to verify that significant leakage flow paths do not exist between the drywell and suppression chamber. The drywell pressure will be increased by at least 1 psi with respect to the suppression pool pressure and then held constant. The subsequent suppression chamber transient (if any) will be monitored with a sufficiently sensitive pressure instrument. If the drywell pressure cannot be increased by 1 psi over the suppression chamber pressure, it would indicate existence of a significant leakage path, which will be identified and eliminated before further drywell vacuum breaker testing. If suppression chamber pressure increases due to drywell vacuum breaker leakage by more than 0.25 inches of water per minute over a 10-minute period, the leakage source will be identified and eliminated before power operation is resumed.

B. Standby Gas Treatment System and
C. Secondary Containment

Initiating reactor building isolation and operation of the standby gas treatment system to maintain at least a 1/4 inch of water vacuum within the secondary containment provides an adequate test of the operation of the reactor building isolation valves, leak tightness of the reactor building and performance of the standby gas treatment system. Functionally testing the initiating sensors and associated trip channels demonstrates the capability for automatic actuation. Performing these tests prior to refueling will demonstrate secondary containment capability prior to the time the primary containment is opened for refueling. Periodic testing gives sufficient confidence of reactor building integrity and standby gas treatment system performance capability.

The test frequencies are adequate to detect equipment deterioration prior to significant defects, but the tests are not frequent enough to load the filters, thus reducing their reserve capacity too quickly. That the testing frequency is adequate to detect deterioration was demonstrated by the tests which showed no loss of filter efficiency after 2 years of operation in the rugged shipboard environment on the NS Savannah (ORNL 3726). Pressure drop tests across filter sections are performed to detect gross plugging or leak paths through the filter media. Considering the relatively short time that the fans may be run for test purposes, plugging is unlikely, and the test interval of once per operating cycle is reasonable. Duct heater tests will be conducted once during each operating cycle. Considering the simplicity of the heating circuit, the test frequency is sufficient.

The in-place testing of charcoal filters is performed using Freon-112 or equivalent, which is injected into the system upstream of the charcoal filters. Measurements of the Freon concentration upstream and downstream of the charcoal filters is made. The ratio of the inlet and outlet concentrations gives an overall indication of the leak tightness of the system. Although this is basically a leak test, since the filters have charcoal of known efficiency and holding capacity for elemental iodine and/or methyl iodine, the test also gives an indication of the relative efficiency of the installed system

High-efficiency particulate filters are installed before and after the charcoal filters to minimize potential release of particulates to the environment and to prevent clogging of the iodine filters. An efficiency of 99% is adequate to retain particulates that may be released to the