Nebraska Public Power District

COOPER NUCLEAR STATION
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CNSS820187

April 21, 1982

Mr. John T. Collins, Regional Administrator
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76011

Dear Sir:

This report is submitted in accordance with Section 6.7.2.B.2 of the Technical Specifications for Cooper Nuclear Station and discusses a reportable occurrence that was discovered on March 22, 1982. A licensee event report form is also enclosed.

Report No.: 50-298-82-06
Report Date: April 21, 1982
Occurrence Date: March 22, 1982
Facility: Cooper Nuclear Station
Brownville, Nebraska 68321

Identification of Occurrence:
A condition which resulted in operation in a degraded mode permitted by Sections 3.7.E.1 and 3.7.A.5 of the Technical Specifications.

Conditions Prior to Occurrence:
The reactor was critical at less than 5% of rated thermal power during plant startup.

Description of Occurrence:
The ductwork between the drywell isolation valves and the air purge inlet valve was found to have failed. As a result, the drywell was not inerted and a differential pressure was not established between the drywell and torus in the time required by the Technical Specifications.

Designation of Apparent Cause of Occurrence:
Complete failure of the ductwork between the drywell isolation valves and the air purge inlet valve caused by a rapid release of pressure in the ductwork. This ductwork is not required for primary containment integrity.

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Analysis of Occurrence:

The primary containment system is designed to provide a protective barrier between the reactor core and the environment. The section of ductwork that failed is not a part of this system but it does provide a path to the drywell for the following functions:

1. Supplies purge air for de-inerting the drywell.
2. Supplies nitrogen for inerting the drywell.
3. Supplies nitrogen make up to the drywell during plant operation.

The failed section could have been isolated from the drywell by two isolation valves either automatically on an isolation signal or manually.

The following is a sequence of events and description of what is believed to be the cause of the failed ductwork. On March 20, 1982, a scram occurred. The scram caused a Group 6 isolation, closing all primary and secondary containment isolation valves. The Group 6 isolation signal was cleared within a few minutes and the group isolation was reset. The primary containment valves remained shut. Since this ductwork is used for nitrogen makeup, while the drywell isolation valves were shut, nitrogen continued to flow into the ductwork pressurizing it to a pressure of approximately 150 psig. This occurred because nitrogen makeup is not normally secured on a group isolation signal. The nitrogen makeup piping is protected from overpressure by a relief valve set at 225 psig. The design pressure of the ductwork is about 75 psig with no associated relief valve. (It is recognized that the relief on the makeup line should have been set at a pressure commensurate with the design pressure of the ductwork.) The ductwork remained in this pressurized state for approximately two hours. The operator then prepared to de-inert the drywell in preparation for a short maintenance outage. The appropriate procedure called for opening the air purge valve. When this valve was opened, the pressure was rapidly released. Unlike the normal opening of the valve with 1 to 2 psid across the disc, this rapid pressure release was somewhat like the firing of a cannon. The massive release literally ripped the ductwork from its hangers between the drywell isolation valves and the air purge valve. (The ductwork, the air purge valve, and the high pressure nitrogen had formed a gas shock tube.)

The failed ductwork was found on March 22, 1982 while trying to inert the drywell with nitrogen after a reactor startup. The drywell was immediately isolated by shutting the drywell isolation valves. At this time it was realized that the drywell would not be inerted in the 24 hours required by CNS Technical Specifications. A temporary Technical Specification change was then requested and granted from the NRC to continue operation while inerting via an alternate path. The drywell was inerted in 28 hours versus 24 hours and the differential pressure was established in 32½ hours versus 26 hours. The Technical Specification change allowed 48 hours.

Due to the fact that primary containment integrity was maintained throughout this event, this occurrence presented no adverse consequences from the standpoint of public health and safety.

Corrective Action:

The ductwork that failed was replaced. The replacement material that was used is of a heavier gauge than the original and the field joints were socket welded. A modification is being implemented to eliminate the nitrogen makeup function of this ductwork by the installation hard piping to the drywell through the ACAD System which has the necessary isolation valves. This modification will incorporate a relief valve. The modification will be made during the May 1982 outage. In the interim, the control room operators have been briefed to secure nitrogen upon isolation of containment.

Sincerely,

L. C. Lessor
Station Superintendent
Cooper Nuclear Station

LCL:cg
Attach.