NON-PUBLIC?: N
ACCESSION #: 8808170347
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Cooper Nuclear Station PAGE: 1 of 3

DOCKET NUMBER: 05000298

TITLE: Manual Reactor Scram and Subsequent Engineered Safety System Actuation Due to Isolated Phase Bus Duct Grounding Problem
EVENT DATE: 07/15/88 LER #: 88-019-00 REPORT DATE: 08/11/88

OPERATING MODE: N POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Donald L. Reeves, Jr. TELEPHONE #: 402-825-3811

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: EL COMPONENT: IPBU MANUFACTURER: I004
REPORTABLE TO NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: On July 15, 1988, at 9:58 A.M., the reactor was manually scrammed subsequent to discovery of electrical arcing at a bolted connection between the removable covers of the "A" Phase Isolated Phase Bus Duct. Prior to inserting a manual scram, power level was reduced from approximately 100 percent to 50 percent power by reducing recirculation flow. In addition, Reactor Vessel water level was increased eight to ten inches above the normal control point in anticipation of the expected water level "shrink". Nevertheless, upon inserting the manual scram, the level transient was of sufficient magnitude that the isolation logic circuits for Groups 2, 3, and 6 Isolations were actuated.

The cause of the arcing was due to a broken ground strap on the "A" Phase bus duct. An additional factor was the cork-neoprene gasket between the bus duct housing and the top removable cover which had degraded to the point where the cover contacted the bus duct housing on the generator side. As a result, a ground path was established through the ungrounded bus duct cover, resulting in the observed arcing.

Immediate corrective action taken included the necessary scram recovery

actions to establish stable plant conditions and restoration of systems to service that had been automatically isolated. The Isolated Phase bus duct components were inspected and all necessary gaskets and ground straps replaced. Further corrective action to be taken includes establishing and implementing appropriate preventive maintenance actions to assure the continued integrity of the bus duct grounding and gasketing system.

(End of Abstract)

TEXT: PAGE: 2 of 3

A. Event Description

On July 15, 1988, at 9:58 A.M., the reactor was manually scrammed subsequent to discovery of electrical arcing at a bolted connection between the removable covers on the "A" Phase Isolated Phase Bus Duct. Upon discovery of the arcing, power level was reduced from approximately 100 percent to approximately 50 percent (777 MWe to 393 MWe) prior to inserting the manual scram. In addition, prior to the manual scram Reactor Vessel water level was increased eight to ten inches above the normal control point in anticipation of the expected water level "shrink" which accompanies a scram from power. In spite of this effort to increase the water inventory in the Reactor Vessel, the level transient was of sufficient magnitude that the isolation logic circuits for Groups 2, 3, and 6 Isolations (Primary Containment, Reactor Water Cleanup, and Secondary Containment, including actuation of the Standby Gas Treatment System, respectively) were actuated.

B. Plant Status

Prior to the power reduction, the plant was in steady state operation at approximately 100 percent power (777 MWe). Just prior to the manual scram, reactor power level had been reduced to approximately 50 percent power (393 MWe) by reducing recirculation flow.

C. Basis for Report

An unplanned manual actuation of the Reactor Protection System (RPS) and subsequent actuation of Groups 2, 3, and 6 Isolation Engineered Safety Features (ESFs), reportable in accordance with 10CFR50.73 (a)(2)(iv).

D. Cause

The cause of the electrical arcing observed at the bolted connections for the "A" Phase Isolated Phase Bus Duct covers was due to a broken ground strap. An additional factor was the cork-neoprene gasket between the bus

duct housing and the top removable cover which had degraded to the point where the cover contacted the bus duct housing on the generator side. As a result, a ground path was established through the ungrounded section of the bus duct, resulting in the electrical arcing. This inappropriate ground path, due to the high bus current and voltage (22,000 V), caused excessive heating of the ground straps and fastening bolts between the upper and lower halves of the bus duct covers.

With regard to the ESF actuations (Group 2, 3, and 6 Isolations) the Reactor Vessel water level transient (shrink), which is expected to occur subsequent to a scram from power, was sufficient in magnitude to reach the low level trip setting (Technical Specification limit of greater than or equal to +12.5 inches). As a result, the Group Isolation logic circuits were actuated.

E. Safety Consequences

None. The response of the plant to the manual scram was as expected. Actuation of the Group 2, 3, and 6 Isolation logic circuits occurred as designed and the resulting isolations were achieved.

F. Safety Implications

Had the plant been in operation at 100% power and time not been available to reduce power before inserting the manual trip, the resulting transient would have been more severe. The overall plant response, however, would have been quite similar to that which occurred during this event.

G. Corrective Action

Immediate corrective action taken included the necessary scram recovery actions to establish stable plant conditions and restoration of systems to service that had been automatically isolated.

The Isolated Phase Bus Duct was inspected and damage was limited to two of the four ground straps. The gaskets along with the broken and damaged ground straps for the "A" Phase covers were replaced. The remaining ground straps, gaskets, and cover bolting on all three phases were also inspected and bolting checked for tightness.

Further corrective action to be taken includes an engineering evaluation regarding preventive maintenance activities that should be implemented to assure the integrity of the Isolated Phase Bus Duct System.

H. Past Similar Events

There have been no previous occurrences associated with the Isolated Phase Bus Duct System.

COOPER NUCLEAR STATION
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CNSS886237

August 11, 1988

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Gentlemen:

Cooper Nuclear Station Licensee Event Report 88-019 is forwarded as an attachment to this letter.

Sincerely,

/s/ GUY HORN
G. R. Horn
Division Manager of
Nuclear Operations

GRH:sg

Attachment

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