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DUKE POWER COMPANY
MCGUIRE NUCLEAR STATION
REPORTABLE OCCURRENCE REPORT NO. 370/83-19

REPORT DATE: June 27, 1983

FACILITY: McGuire Unit 2, Cornelius, NC

IDENTIFICATION: Inadequate Surveillance Performed on Containment Pressure Control System

DESCRIPTION: During a procedure review on May 26, 1983, it was discovered that the monthly test of the Containment Pressure Control System (CPCS) was being performed inadequately. The test failed to satisfy the surveillance requirements of McGuire Technical Specification 4.3.2.1, Table 4.3-2, Item 6. A pertinent change in monthly testing requirements in the newly issued combined Unit 1 and 2 Technical Specifications was not identified and incorporated into the monthly test procedure to check permissive/termination setpoint accuracy. This incident is attributed to Administrative Deficiency. Unit 2 was in Mode 3 at the time of discovery.

The appropriate setpoint devices were subsequently checked for accuracy, revealing that five of eight channels (4/train) exceeded the Technical Specifications Allowable Value. The CPCS was immediately declared inoperable and the NRC was notified via the Emergency Notification System that Unit 2 had been placed in Limiting Condition for Operation (LCO) 3.0.3, on May 26, 1983.

The cause of the out-of-tolerance instruments is attributed to Administrative/Procedural Deficiencies for reasons given in the Evaluation section of this report.

This event is reportable pursuant to Technical Specifications 6.9.1.10.f.

EVALUATION: The CPCS monthly test procedure had been developed to satisfy the surveillance requirements of McGuire Unit 1 Technical Specifications (issued January 28, 1981; now superceded) based upon the stated definition of "Channel Functional Test":

1.5 A CHANNEL FUNCTIONAL TEST shall be:

- a. Analog channels - injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions.

Procedure "Containment Pressure Control Functional Test" was written to satisfy this requirement by checking the operation of the CPCS alarm modules permissive actuation. The setpoints were not verified.

In the current McGuire Units 1 and 2 combined Technical Specifications (issued March 3, 1983; in effect for Unit 1 on March 29) the Term "Channel Functional Test" was replaced by "Analog Channel Operational Test" and thus defined:

- 1.3 An ANALOG CHANNEL OPERATIONAL TEST shall be the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY of alarm, interlock and/or Trip Setpoints such that the setpoints are within the required range and accuracy.

The new term and definition represent a change in testing activities since the setpoints must be verified. The significance of the change was not realized during reviews performed in January and February of draft copies of the new Technical Specifications and the subsequent review of the approved document. The impact upon the CPCS monthly test procedure was discovered during a procedure review on May 26, 1983.

This incident resulted from a failure to identify the significant change in the McGuire Units 1 and 2 Technical Specification during the Technical Specification review.

The immediate corrective action was to perform calibration checks on all CPCS alarm modules (R.I.S. model ET-1215). Five of the eight modules exceeded the Technical Specification (Table 3.3-4 Item 6) Allowable Value of ≤ 0.25 psid. The CPCS was subsequently declared inoperable and the NRC notified via the Emergency Notification System. The alarm modules were then recalibrated and the CPCS declared operable.

The maximum error was found on alarm module 2NSRL5510: the "As Found" setpoint was 4.1 psid. 2NSRL5510 provides the start permissive for containment spray system (NS) spray pump 2B. The redundant Train A alarm module, 2NSRL5520, provides the start permissive for NS spray pump 2A and was found set at 3.1 psid.

It was discovered that none of the eight alarm modules had the required calibration stickers which state the previous calibration date. A review of the Pre-turnover Survey revealed that no data sheets had been written for the alarm modules and it was theorized that the instruments had never been calibrated. (The Pre-Turnover Survey included the first NS System instrument calibrations performed prior to Unit 2 initial start-up).

The personnel that performed the NS system turnover stated that the alarm modules were calibrated, but that no data sheets were used since instrument numbers had not been provided in the Mechanical Instrument and Controls List. The alarm modules, which contain two initial relays actuated by an analog signal, were considered as "relays" and therefore no instrument numbers were assigned.

Four of the alarm modules were found set at 4 psid, three at 0.1 psid, and one at 3.1 psid. These inconsistent "As Found" values, along with the absence of data sheets, prevent confirmation of a previous calibration using correct setpoint

values. Since appropriate guidance was not sought by or given in the processing of alarm modules during the Pre-turnover Survey, this incident is attributed to Administrative Deficiency.

CORRECTIVE ACTION: All CPCS alarm modules were recalibrated to a setpoint of 0.13 psid. (This setpoint will provide a margin to ensure the Technical Specification Allowable Value of ≤ 0.25 psig is not exceeded due to instrument drift.)

A procedure change will be made to the "Containment Pressure Control Functional Test", to ensure setpoint accuracy is verified. This will be done prior to the June, 1983 monthly test.

Prior to the initial Unit 2 start-up, a Preventive Maintenance/Periodic Testing (PM/PT) work request program was established. This program includes all Technical Specification surveillance requirements. The CPCS is included in this program, and computer generated work request listing all CPCS instruments, including the alarm modules, ensures that the instruments will be calibrated prior to the end of the 18 month period following the previous calibration. (The computer system includes the instrument numbers and required procedures.)

The Unit 1 and 2 instrumentation surveillance procedures are currently being reviewed to ensure they include setpoint verification, where required, and that the procedures meet all other Technical Specification surveillance requirements. This review will be completed by July 1, 1983.

The PM/PT program will be modified to include required setpoints on the work requests issued for the 18 month CPCS calibrations. This modification will also be accomplished on the Unit 1 PM/PT program.

The procedure changes and addition of setpoint verification procedures to the PM/PT program will ensure all Technical Specification surveillance requirements are met for the CPCS System.

SAFETY ANALYSIS: The Containment Pressure Control System (CPCS) provides an interlock function which inhibits inadvertent actuation of the Containment Spray System (NS) and the Containment Air Return Exchange and Hydrogen Skimmer System (VX). The CPCS inhibits NS or VX actuation if the containment pressure is less than 0.25 psig. This interlock prevents a potential containment integrity concern in the event that a spurious NS or VX actuation might result in a negative containment pressure due to condensation effects.

The calibration errors resulted in a potential inhibit of the normal actuation of the NS and VX systems. These systems normally actuate at a containment pressure of 3.0 psig; however, in the case with the maximum calibration error, the actuation setpoint was effectively 4.1 psig. An evaluation was therefore undertaken to determine the impact, if any, of the slightly increased actuation setpoint for the NS and VX systems under this degraded condition.

The NS and VX systems are designed to mitigate the containment pressure response to a high energy line break, in conjunction with other containment systems. The design basis of these containment systems is essentially to

prevent exceeding the design pressure of the containment. The containment pressure response to a large pipe break is characterized by a relatively rapid and steady initial pressure increase to well above the degraded 4.1 psig setpoint. The NS and VX systems would actuate as designed, with only a relatively short delay corresponding to the time between the pressure increasing from 3.0 to 4.1 psig. For other scenarios which do not result in the containment pressure exceeding the 4.1 psig actuation setpoint, the containment design pressure is not challenged, and therefore the remaining containment systems are capable of providing the necessary mitigative function, without the actuation of the NS and VX systems.

Based on the above arguments, this evaluation has determined that for those scenarios requiring NS and VX actuation to mitigate the pressure response of the containment, the effect of the increased actuation setpoint is limited to a short time delay for actuation. This delay is considered acceptable based on a review of the dynamic containment pressure response following high energy line break events.

The health and safety of the public were unaffected by this incident.

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June 27, 1983

Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street NW, Suite 2900
Atlanta, Georgia 30303

Re: McGuire Nuclear Station Unit 2
Docket No. 50-370

Dear Mr. O'Reilly:

Please find attached Reportable Occurrence Report RO-370/83-19. This report concerns T.S. 4.3.2.1, "Each ESFAS instrumentation channel and interlock and the automatic actuation logic and relays shall be demonstrated operable by the performance of the ESFAS instrumentation surveillance requirements specified in Table 4.3-2". This incident was considered to be of no significance with respect to the health and safety of the public.

Due to administrative delay this report is being submitted 1 working day late. We regret any inconvenience this may have caused.

Very truly yours,

H. B. Tucker

Hal B. Tucker

PBN:jfw
Attachment (2)

cc: Document Control Desk
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Washington, D. C. 20555

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Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
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Mr. W. T. Orders
NRC Resident Inspector
McGuire Nuclear Station

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