

DUKE POWER COMPANY

P.O. BOX 33189
CHARLOTTE, N.C. 28242

HAL B. TUCKER
VICE PRESIDENT
NUCLEAR PRODUCTION

April 29, 1983

TELEPHONE
(704) 373-4531

03 MAY 9 10:00

U.S. NRC REG-IT
Atlanta, Ga.

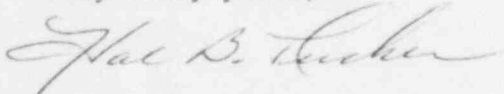
Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

Re: McGuire Nuclear Station Unit 1
Docket No. 50-369

Dear Mr. O'Reilly:

Please find attached Reportable Occurrence Report RO-369/83-13. This report concerns T.S. 3.5.1.2, "Each upper head injection accumulator system shall be operable...". This incident was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,



Hal B. Tucker

PBN:jfw
Attachment

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

Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

Mr. W. T. Orders
NRC Resident Inspector
McGuire Nuclear Station

8305110281 830429
PDR ADOCK 05000369
S PDR

OFFICIAL COPY

IE 22

DUKE POWER COMPANY
McGUIRE NUCLEAR STATION
REPORTABLE OCCURRENCE REPORT NO. 369/83-13

REPORT DATE: April 29, 1983

FACILITY: McGuire Unit 1, Cornelius, NC

IDENTIFICATION: UHI Level Switches Found Out of Tolerance During Calibration

DESCRIPTION: McGuire Technical Specification 4.5.1.2.c.1 requires "Each Upper Head Injection (UHI) Accumulator System shall be demonstrated OPERABLE at least once per 18 months by verifying that each accumulator isolation valve closes automatically when the water level in the accumulator is 76.6 ± 0.5 inches for atmospheric pressure (72.5 ± 0.5 inches for blowdown pressure) above the bottom inside edge of the water-filled accumulator...".

Contrary to this requirement, the maintenance history of the four Unit 1 UHI level switches demonstrates that the instrument setpoints have not been maintained within the ± 0.5 inch tolerance.

Unit 1 was in Mode 5 and 6 during the latest switch calibrations of February 23 through April 23, 1983; however, the switches are presumed to have been out of tolerance during power operation.

This incident is attributed to Design Deficiency, since the switches are not capable of the accuracy required.

Additionally, Unit 1 UHI level switches were found out of tolerance during the July 3, 1982 calibrations. This incident was not reported to the NRC due to an inadvertent administrative error.

EVALUATION: McGuire has experienced a continuing problem meeting the Technical Specification 4.5.1.2.c.1 level switch setpoint tolerance of 76.6 ± 0.5 inches (at atmospheric pressure) for the Barton Model 288A differential pressure indicating switches. A long term accuracy of ± 0.5 inches must be attainable to meet this tolerance throughout the calibration interval. Instrument history has demonstrated that this has not been achieved, and that short term accuracy may realistically be placed at ± 2.0 inches.

Discussions with Westinghouse personnel and a review of available documents indicates that the problem may have originated in the initial Technical Specification switch tolerance of ± 0.25 inches (specification was changed March 3, 1983). This value corresponded to a switch 'setting tolerance' of 0.2%, not the accuracy of the instrument. (This 'setting tolerance' is identified in FSAR Volume 10 Table 15.4.1-7 as $\pm 5 \text{ ft}^3$, which corresponds to ± 0.25 inches at the specified level setpoint.)

The manufacturer's specifications for this switch (0-120 inch range) are as follows:

INDICATION ACCURACY (At the point of switch actuation): $\pm 1.5\%$ of Full Scale
(± 1.8 inches)

SWITCH REPEATABILITY: $\pm 0.2\%$ of Full Scale (± 0.2 inches)

It is the opinion of Duke Power Company that components of the Indication Accuracy Tolerance, such as drift and temperature effects (not included in Switch Repeatability), would nonetheless affect the switch setpoint accuracy, since the same mechanism which drives the indicator also actuates the switch. It therefore appears that the indication accuracy and switch repeatability tolerance should be added to obtain the long term switch accuracy.

Until February 1983, the calibration of the switches was performed using a piece of tubing filled with water to simulate the tank, and the installed reference leg on the opposite side of the differentail pressure unit was used for reference. This was done at the recommendation of Westinghouse. The July 1982 calibration repeatability problems led to the discovery of gas pockets forming in the reference leg when the instruments were depressurized for calibration; similar problems had been identified at Sequoyah. A new procedure was written for the February 1983 calibrations. This procedure, "UHI Level Switch Calibration", isolates the instrument from the tank and reference leg. The calibration is then performed using the differential pressure that would be seen by the level switch at the setpoint due to the difference in the height of the reference leg and the water level in the tank.

Calibrations performed April 5 through April 23, 1983 were performed by Barton and McGuire technicians using optimum techniques in order to check repeatability. To improve repeatability, Unit 1 microswitches were replaced in all instruments except level switch INILS 5740. Additionally, the microswitch plunger screw tip was filed flat to provide a larger contact surface on all switches of Unit 1 and 2 during the calibrations.

Level switch INILS 5740 demonstrated the largest errors using the new procedure. During the April 6 calibration the jewel bearing was found loose in its mount. This problem was repaired and the instrument repeatability was then checked and verified to be adequate.

Disregarding INILS 5740 due to the mechanical problems, the maximum change during the vendor assisted calibrations was ± 1.33 inches on INILS 5720. From this data, Duke Power Company believes that a ± 2 inches repeatability is achievable. This figure does not include long term drift, since long term data has not been gathered using the new calibration technique.

ADDITIONAL INCIDENT: The Unit 1 UHI level switches were found out of tolerance during the July 3, 1982 calibration, but were not reported to the NRC. The Preventative Maintenance/Periodic Test (PM/PT) work requests which documented the out of tolerance conditions were incorrectly signed off by Operations personnel. (Only the Licensing section is authorized to sign PM/PT work requests.) The completed work requests were then sent to planning. This prevented Licensing personnel from obtaining a copy for review by the Licensing Engineer in order to determine reportability.

CORRECTIVE ACTION: A proposed change to Technical Specification No. 4.5.1.2.c.1 has been submitted to the NRC revising the level switch setpoint to 76.25 ± 4.5 inches. Until this amendment is approved, the heat flux hot channel factor, $F_Q(Z)$,

for McGuire Units 1 and 2 will be administratively limited to 2.20. (This is a continuation of the administrative limit for Unit 1 as stated in Reportable Occurrence Report No. RO-369/82-38, and is hereby extended to include Unit 2.)

To ensure that reportable out of tolerance conditions are identified, Operations personnel will be reminded, through review of this report in crew meetings, that only Licensing personnel may sign the final acceptance of PM/PT work requests.

SAFETY ANALYSIS: Reportable Occurrence Report No. RO-369/82-38 stated that the UHI level switch instrument accuracy was ± 2.04 inches and that per Westinghouse recommendations, a $FQ(Z)$ reduction of 0.12 (resulting in a limit of 2.20) was being observed. Based upon the recent vendor assisted calibrations using the new procedure, this limit is adequate. Additionally, the UHI Water Volume Uncertainty Analysis in FSAR Vol. 10, Table 15.4.1-7 provides a margin of $\pm 24 \text{ ft}^3$ (± 1.2 inches) for level instrumentation accuracy (includes drift and repeatability), even though Technical Specifications require a tolerance of ± 0.5 inches.

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