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December 20, 1984

Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Subject: McGuire Nuclear Station
Docket Nos. 50-369, 50-370

Dear Sir:

On November 14, 1984 we met in Atlanta with our respective technical staffs to discuss the recent events related to the Upper Head Injection (UHI) systems of both McGuire units. As a result of the discussion, several items were discussed which Duke agreed to review. These were to evaluate compliance with Technical Specification 4.5.1.2C; to evaluate the complete draindown of the UHI water accumulator as a means to satisfy the above specification; and to evaluate the apparent poor performance of Kerotest valves in recent McGuire history. The evaluation of these items is included as an Attachment to this letter.

Please also note that two Licensee Event Reports have been submitted on these events. LER 369/84-29 on November 29, 1984 and LER 369/84-30 on December 3, 1984. If there are any questions regarding the information provided, please contact us.

Very truly yours,

Hal B. Tucker

H. B. Tucker

RLG/mjf

Attachment

cc: Mr. Darl Hood
Project Manager -Region II
U. S. Nuclear Regulatory Commission
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

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

DUKE POWER COMPANY
McGuire Nuclear Station

I. DISCUSSION OF COMPLIANCE WITH TECHNICAL SPECIFICATION 4.5.1.2C

During the course of the Duke presentation on November 14, 1984, the NRC raised the concern that the periodic surveillance being performed by Duke may not be in accordance with the applicable Technical Specification. Duke has reviewed the requirements as well as the surveillance being conducted and considers that testing is being conducted which meets the intent of the specification, and is consistent with testing requirements for other similar systems.

Duke believes that as written Specification, 4.5.1.2C is ambiguous as to intent. As such, Duke intends to submit, under a separate cover letter, a proposed Technical Specification revision, to clarify the intent.

Technical Specification 4.5.1.2C states:

> "Each Upper Head Injection 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 is 76.25±3.3 inches above the bottom inside edge of the water-filled accumulator with atmospheric pressure in the accumulator."

As presently written, it could be interpreted as either requiring water level reduction or simulation to the setpoint in order to verify each accumulator isolation valve closes. However, such an interpretation is not practical (as discussed in Section II), and is not consistent with testing performed on other systems where an instrument reaching a setpoint actuates a device.

Technical Specifications allow three types of surveillance to be used singularly or in combination to verify proper channel functioning. These are:

ANALOG CHANNEL OPERATIONAL TEST

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 functions. The ANALOG CHANNEL OPERATIONAL TEST shall include adjustments, as necessary, of the alarm, interlock and/or Trip Setpoints such that the Setpoints are within the required range and accuracy.

CHANNEL CALIBRATION

A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel such that it responds with the required range and accuracy to known values of input. The CHANNEL CALIBRATION shall encompass the entire channel including the sensors and alarm, interlock and/or trip functions and may be performed by any series of sequential, overlapping, or total channel steps such that the entire channel is calibrated.

Trip Actuating Device Operational Test

> A TRIP ACTUATING DEVICE OPERATIONAL TEST shall consist of operating the Trip Actuating Device and verifying OPERABILITY of alarm, interlock and/or trip functions. The TRIP ACTUATING DEVICE OPERATIONAL TEST shall include adjustment, as necessary, of the Trip Actuating Device such that it actuates at the required accuracy.

Examples of the applications of these types of surveillance can be found in McGuire Technical Specification 3/4.3, Instrumentation. In all cases, instrumentation is tested by either a Trip Actuating Device Operational Test or the combination of Analog Channel Operational Test and Channel Calibration. The specific testing is dependent upon the particular instrument system involved.

Examples of devices which require Trip Actuating Device Operational Testing include Manual Reactor Trip, SI input from ESF, Manual SI, Manual Containment Spray, and Manual Containment Isolation. Examples of devices which require Analog Channel Operational testing include High Pressurizer Water Level, Low-Low and High-High Steam Generator Water, RWST Level, and Low-Low Pressurizer Pressure. For these types of instrumentation loops, it is not reasonable or practical to manipulate the process system so as to achieve the required actuation setpoint. Rather, test signals are used to perform the operational test. Such signals are placed as close to the sensor as practical. The use of sequential, overlapping, or total channel steps is allowed, so long as the entire channel is calibrated.

The same type of philosophy of testing applies to the 18 month functional testing of UHI automatic isolation valve closure on accumulator water level. This test can be considered a channel calibration. The entire loop from level transmitter to valve actuation is tested. Testing is sequential, overlapping, or total channel steps is allowed. Manipulation of actual process system fluid level is not required. Additionally, system functional verifications are contained in many specifications and in virtually every case, the terms "test signal" or "simulate" are used when inputs to the sensor are specified.

In fact, Specification 4.5.1.1.1.d, Cold Leg Injection Accumulators, states:

> At least once per 18 months by verifying that each accumulator isolation valve opens automatically under each of the following conditions:
>
> 1) When an actual or a <u>simulated RCS pressure signal</u> exceeds the P-11 (Pressurizer Pressure Block of Safety Injection) Setpoint,
>
> 2) Upon receipt of a <u>Safety Injection test signal.</u>

(Emphasis added)

Thus, Duke considers that the surveillance presently being conducted, which is a channel calibration of each level transmitter utilizing a test signal in conjunction with a functional test of each isolation valve, is adequate, fully meets the intent the Specification, and is consistent with surveillance testing performed on other instrument loops.

However, Duke also recognizes that the Specification as written is ambiguous. Accordingly, Duke intends to propose a revision to Technical Specifications that specifically allows the use of either an actual or simulated water level signal.

II. Discussion of the Merits/Implications of Performing Full UHI Tank Draindown to Satisfy Technical Specifications

The 18-month functional testing of the UHI discharge valves to close on low accumulator water level is considered a channel calibration, and as such, overlapping tests are performed to verify complete and proper channel calibration. The first portion of the test is performed by IAE to calibrate the UHI level channels and verify that the level transmitters provide signals to the alarm modules at the level setpoint, then verifying these actuating modules provide contact closures to close the discharge valves. However, to prevent the valves from closing, IAE opens the circuit downstream of the module. Then, for the second portion of the test, Performance jumpers the contacts in the module in order to stroke and time the valves, thus completing the overlapping test.

The section of the IAE procedure to verify contact closure at the water level setpoint is practical and realistic. In essence, the "wet rig" setup basically isolates the water accumulator from the reference leg and uses the reference leg as a "skinny water accumulator." The water level is slowly lowered in the tygon hose (just like it would if the tank itself were draining) and the setpoint actuation level is verified. The tygon hose is in parallel with the reference leg to actually measure the level. Since the level setpoint is referenced from the inside bottom of the tank, there must be external means to reference the level. A placard has been placed on the accumulator tank wall which reads "UHI ACCUM 1A LEVEL REF 24" ABOVE INSIDE BOTTOM". The scribe lines on this placard serve as the reference point to which the level actuation tests are performed.

This test method is considered by Duke to meet the intent of Technical Specification 4.5.1.2.c and is practical. Draining the UHI water accumulator is not essential for compliance with Technical Specification and is not practical for a number of reasons:

1) In the normal operating line up, the accumulator would have to be gravity drained to the Waste Evaporator Feed Tank (WEFT) and could not be recovered. That approximately 14,000 gallons of borated water sent to the WEFT would need to be processed as radwaste, at a substantial cost. Alternately it could be transferred back to the RWST, but that would require an abnormal line up involving hooking up hoses, realigning valves and using some sort of pump to transfer the water. Such an operation is not practical from a manpower utilization standpoint.

2) Before any draining or transferring could take place, the system would have to be depressurized. The system is pressurized to 1200 PSI and venting off that high a pressure is going to create a risk of bursting the rupture disk. If the rupture disk fails, additional outage time would be required to replace it.

3) Time is a major factor when considering whether or not it is practical to drain the accumulator for a test. During a "mini-outage" on Unit 1, it took station personnel approximately 3 days to drain the UHI accumulator. The tank water level would have to be lowered slowly because of the wave disturbance and sloshing in the tank. Technical Specifications call for static water conditions to verify

setpoint level. In order to measure it accurately, the water level would have to be lowered slowly. It may become necessary to repeat the process to get a good test. This could take much more time than had been planned.

4) This practice would also not be consistent with ALARA practices. Since the area is an RCZ, radioactivity will be in the area. Additional personnel exposures would result because testing duration is uncertain, it is difficult to minimize exposure time.

5) If such a test were done, the instrument lines would have to be vented to remove gas products from the reference leg following refilling of the tank. It would require numerous instrument valve manipulations. As a result, the assurance of proper operation would be no greater than it is using the current method.

To summarize, Duke Power considers the present surveillance being conducted, which consists of a channel calibration overlapping with a functional test of each discharge valve, to be adequate in its intent to meet the required Technical Specification. This test is also consistent with surveillance performed on other similar instrument loops.

III. DISCUSSION OF KEROTEST VALVE PERFORMANCE

During the November 14, 1984 meeting the NRC expressed concern about the history of negative Kerotest valve performance (i.e. UHI vent sightglass failure and others back to 1980) and the lack of apparently a strong commitment to address the leaking valves that brought about the current situation. Duke explained the current plans which include reducing total number of leaks and perhaps replacement of valves.

The following supplemental information is provided in response to this concern.

1. Duke has reviewed the use of Kerotest valves in the reactor coolant pressure boundary as well as other applications and conclude that the majority of Kerotest packless valves at McGuire are fully suitable for their application. In those applications where the use of Kerotest valves has been determined not to be appropriate, the valves will be replaced.

2. Kerotest valves will be repaired whenever over-torquing is necessary to properly close the valve.

3. As problems with Kerotest valve installations arise, Duke will modify valve placement or orientation as necessary to eliminate obstructions that prevent normal valve operation.

4. Training, as appropriate, will be provided to applicable station personnel to cover such Kerotest valve features as maximum torque, short stem travel, and that they should never be throttled.