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August 2, 1984

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

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

Reference: RII:RHA
NRC/OIE Inspection Report 50-369/84-07 and 50-370/84-07

Dear Mr. O'Reilly:

Pursuant to 10CFR2.201, please find attached a response to violations 50-369/84-07-01, 50-369/84-07-02, 50-370/84-07-03, and 50-370/84-07-06 which were identified in the above referenced inspection report.

Duke Power Company does not consider any information contained in this report to be proprietary.

Very truly yours,

H.B. Tucker /BN

Hal B. Tucker

PBN:glb

Attachment

cc: Mr. W. T. Orders
Senior Resident Inspector-NRC
McGuire Nuclear Station

DUKE POWER COMPANY
MCGUIRE NUCLEAR STATION
Response to NRC/OIE Inspection Report
50-369/84-07 and 50-370/84-07

Violation 50-369/84-07-01, Severity Level IV:

10 CFR 20.201(b) requires that each licensee shall make or cause to be made such surveys as may be necessary for the licensee to comply with the regulations in this part. A "survey" is defined in 10 CFR 20.201(b) as evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radiation under a specific set of circumstances. 10 CFR 20.202 requires each licensee to provide individuals with personnel monitoring devices under specified conditions to provide information used as part of such surveys.

Contrary to the above, the requirement to perform an evaluation was not met in that during August 1983, a thermoluminescent dosimeter (TLD) reader malfunctioned and the TLD reader operator assigned the individual the pocket dosimeter (PD) totals from the computer record. No determination as to the accuracy or completeness of the computer record was made prior to assigning the exposure.

Response:

1. Duke Power Company agrees that the violation occurred as stated. The requirement to perform an evaluation, under a specific set of circumstances was not met.

2. The method of assigning dose in the past, as in this case, was adopted by the Duke Power Company Dosimetry Laboratory and was considered to be conservative and appropriately accurate. It should be noted that the pocket dosimeter value assigned was probably very conservative since the PD/TLD correlation program within Duke Power Company is very accurate.

3. The method of assigning dose was changed shortly after Duke became aware of this incident and the potential problems involved.

4. A policy memorandum was issued on May 25, 1984, to all nuclear station Health Physicists and to the Health Physicist in charge of the TLD Laboratory, by the System Health Physicist, which assigns this responsibility to the Station Health Physicist and outlines guidance for determining the actual dose to be assigned in these circumstances. A copy of this memo is available at each location for review by NRC inspectors.

5. The station is presently in full compliance with the code of federal regulations in this area.

Violation 50-369/07-02, Severity Level IV:

Technical Specification 6.11 requires that procedures for radiation protection be prepared consistent with the requirements of 10 CFR 20 and shall be approved, maintained and adhered to for all operations involving personnel radiation exposure.

Health Physics Manual Section 2.2, step 2.2.5 requires personnel to turn in dose cards on days when they enter the Radiation Control Area.

Health Physics Procedure HP/0/B/1000/03, Investigation of Potential Over-exposure, requires that when an exposure investigation is performed, the individual's dose card will be retained until the exposure investigation is complete so that the exposure will be entered on the card.

Contrary to the above, the requirement to have procedures for personnel radiation protection and to adhere to such procedures was not met in that:

a. Dosimetry procedure DL/0/B/1100/01 step 4.6.8 permits the pocket dosimeter totals on the computer to be assigned as an individual's exposure when the TLD result is not available although the computer pocket dosimeter total is known not to be reliable. This procedure does not adequately implement 10 CFR 20 requirements.

b. During March 1984, the doses determined by investigations for two individuals who lost their pocket dosimeter (PD) and/or TLD were not added to the individual's dose cards or computer exposure records as required by procedure HP/0/B/1000/03.

c. Licensee records for TLD/PD correlations for 1983 indicated that all personnel who enter the radiation control zone do not turn in dose cards as required by Health Physics Manual Section 2.2.

Response:

1. Duke Power Company agrees that the violation occured as stated.

2. While the necessary procedures were in place they were either not sufficient to prevent human error or not adequate to meet the intent.

3. a. DL/0/B1100/01 has been changed to require station evaluation of abnormal dose assignment situations.

   b. A step has been added to HP/0/B/100/03 to check the dosecard history to ensure incorporation of doses assigned thru investigation.

   c. The "single point" Health Physics access station has been opened and all personnel are required to turn in their dose card upon exiting the Radiation Control Area.

4. Additional training has been provided to all Health Physics personnel on HP/0/B/1000/03.

5. The station is presently in full compliance with Technical Specifications in this area.

Violation 50-370/84-07-03, Severity Level IV:

Technical Specification 6.12.2 requires that high radiation areas greater than 1000 mr/hr which are within large areas such as PWR containment, where no enclosure exists for purposes of locking shall be roped off, conspicuously posted and a flashing light shall be activated as a warning device.

Contrary to the above, during February-March 1984 the requirement to mark high radiation areas greater than 1000 mr/hr with a flashing light when the area is not readily locked was not met in that during work on steam generators B, C, and D for Unit 1 the manways were not marked with a flashing light. The radiation dose rate at the steam generator manways and inside the steam generator were greater than 1000 mr/hr.

Response:

1. Duke Power Company agrees that the violation occurred as stated.

2. The supervisor(s) responsible for the Steam Generator work did not consider the Steam Generator Cold Leg Channel Head as an area, per se, since it is a confined space. They considered the platform as an area. Since the dose rate on the platform was less than 1000 mr/hr, no flashing light was posted. It should be noted that when no technician was present the eddy current probe diver was positioned such that entry into the channel head was not possible.

   It should also be noted that all other areas, greater than 1000 mr/hr, in the building were posted with flashing lights. Thus it was not a lack of knowledge of the requirement, but an erroneous viewpoint.

3. All personnel have been made aware that confined spaces are to be considered areas.

4. The requirement for flashing lights will be incorporated into the Steam Generator entry Standard Operating Procedures.

5. All actions will be taken and full compliance with Technical Specifications in this area reached prior to the next outage in which Steam Generator Entry work is performed.

Violation 50-370/84-07-06, Severity Level IV:

License condition 2.C.10, NUREG-0737 conditions, for Unit 2 requires that a high-radiation sampling system for obtaining reactor coolant samples under degraded core accident conditions shall be operable prior to exceeding 5% power. The facility Technical Specification 1.18 defines a system, subsystem, train, component or device to be operable when it is capable of performing its specified functions.

NUREG-0737, Item II.B.3, specifies that the reactor coolant post accident sampling system shall be capable of analyzing reactor coolant samples for chlorides, dissolved hydrogen, certain radionuclides (e.g., noble gases), and boron.

Contrary to the above, the reactor coolant post accident sampling system was not operable prior to Unit 2 exceeding 5% power during May 1983 in that:

a. The system is unable to provide a representative reactor coolant sample for the purpose of measuring chlorides in the coolant. All reactor coolant samples drawn from the system are contaminated with chlorides during sampling.

b. The Unit 2 system has not demonstrated the ability to reliably provide a reactor coolant gas sample for the purpose of measuring dissolved hydrogen. Only one monthly test, March 1984, indicated an acceptable result.

c. On April 5, 1984, a Unit 2 reactor coolant noble gas sample was not demonstrated to be representative of dissolved noble gases in the reactor coolant. The ^{135}Xe concentration determined from this test was a factor of 20 below the actual concentration in the coolant.

Response:

1. Duke Power Company denies the alleged violation. The Post Accident Sampling System designed and installed by Duke Power Company was intended to provide the ability to obtain reactor coolant and containment atmospheric samples promptly and within acceptable radiation exposure limits in the event of a degraded core accident. Our design was begun in an effort to be responsive and timely to requirements set forth in NUREG-0660. Although NUREG-0737 was published near the end of our design process, we did not have the benefit of all subsequent clarifications to NUREG-0737 prior to manufacturing our sampling panels. Nevertheless, we feel that our Post Accident Sampling System meets the intent of NUREG-0737, Item II.B.3, Criterion (10). Our belief is substantiated by the Safety Evaluation By The Office Of Nuclear Reactor Regulation, TMI Action Item (NUREG-0737) II.B.3, Post Accident Sampling System, Duke Power Company, Oconee Nuclear Station, Units Nos. 1, 2, and 3, Docket Nos. 50-269, 50-270, and 50-287, pp. 7 and 8.

   However, our Post Accident Sampling System was not intended to be able to reliably demonstrate accurate sample results under normal plant operating conditions. Nor do we believe that demonstration of sample accuracy with normal coolant or atmospheric samples is required by NUREG-0737.

   Our initial functional testing demonstrated the system's ability to provide reasonably accurate sample results under severe accident conditions. We continue to believe that our panels would function under such conditions.

   Duke's experience with the Post Accident Sampling System since installation has, however, led us to believe that the ability to reliably demonstrate accurate sample results during normal plant operation would be beneficial. The increased proficiency and confidence of our operating staff would be improved with this capability.

   With our internal concerns in mind and with a generic concern expressed by INPO on the performance of Post Accident Sampling System in the industry, Duke formed a Task Force to comprehensively review our Post Accident Sampling System for all our nuclear power stations. This Task Force first met in February, 1984, and has been working steadily since that time. Design modifications recommended by this Task Force are presently underway at McGuire which

will facilitate accurate sampling during normal operations while still meeting radiation dose limitations and time requirements. Some further refinements of the system are anticipated as a result of the on-going work of this Task Force.

With this general information in mind, comments on each specific allegation are given below:

a. Because of the low chloride concentration (below the detection limit) in the reactor coolant during normal operation, it is not possible to demonstrate the accuracy of chloride analysis on the post accident liquid sample panel using a normal reactor coolant sample. It was, therefore, decided that if the dilution factor is demonstrated to be acceptable, it should be adequate to show that chloride analyses can be performed on diluted reactor coolant samples under accident situation. The functional testing of the liquid sample panel demonstrated that the accuracy of the remote dilution was within the acceptable limits. This was also shown by obtaining acceptable boron analysis results. Only very recently it was found that the reference electrode used for pH measurements slowly bleeds chloride into the sample. An immediate design change was initiated to alleviate the problem. With this design change, the chloride bleed from the reference electrode will not affect the chloride analysis results.

b. The Duke Power Company Post Accident Liquid Sampling System (PALSS) was designed to sample reactor coolant under degraded core accident conditions. The functional test data generated by DPC for the PALSS demonstrated that analyses for hydrogen is reliable when the reactor coolant hydrogen concentration is >50.c.c/Kg. Under degraded core conditions it is highly likely that the hydrogen concentration will be >50 c.c./Kg. If the hydrogen concentration is <50 c.c./Kg, it is not a safety concern since it is within the normal operating range.

   No provision to demonstrate sampling accuracy under normal operating condition (25-50 c.c./Kg) was designed into the panels, nor was it required by NUREG-0737, Item II.B.3. Duke Power Company is, however, modifying the panels to reduce the dilution factor in order to provide such a demonstration.

c. Again, it should be stated that the DPC PALSS was designed to sample reactor coolant under degraded core accident conditions and not normal operating conditions. As a consequence, the dilution of radiogases under normal operating conditon results in exceedingly poor counting statistics. Under degraded core accident conditions, when the gas sample dilution is needed, this error will become small. Duke Power Company has demonstrated the accuracy of the dilution factor during the functional testing for the panels. This is the technical issue of concern for post accident sampling.

   NUREG - 0737, Item II.B.3 states that the sensitivity of the sample analysis method should permit measurement of nuclide concentration in the ranges from approximately 1μCi/g to 10 Ci/g. On April 5, 1984, the Unit 2 ^{135}Xe concentration was 6.5×10^{-3} μ Ci/g. No provision to demonstrate sampling accuracy with this level of noble gas activity under normal operating conditions is required by NUREG-0737, nor was it designed into the DPC PALSS. Duke Power is, however, modifying the panels to reduce the dilution factor in order to provide such a demonstration.