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March 30, 1990

Docket No. 50-353
License No. NPF-85

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

SUBJECT: Limerick Generating Station, Unit 2
Response to Recommendations Noted in
Inspection Report No. 50-353/89-32

The NRC letter dated January 31, 1990, transmitted Inspection Report No. 50-353/89-32 for the Limerick Generating Station, Unit 2. This inspection covered selected TMI Action Plan Requirements (Post Accident Sampling Systems - PASS). This letter requested that we respond to the noted recommendations contained in this report within 60 days. The attached response restates each recommendation identified in the January 31, 1990 letter followed by our response.

If you have any questions or require additional information, please do not hesitate to contact us.

Very truly yours,

M. J. McCormick Jr.

WGS:nlk

Attachment

cc: W. T. Russell, Administrator, Region I USNRC
T. J. Kenny, USNRC Senior Resident Inspector, LGS

IE01
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Reply to Recommendations Regarding The Post Accident Sampling System

POST ACCIDENT SAMPLING SYSTEM, ITEM II.B.3

ITEM 1

NRC Recommendation (Ref. 4.5.1 {pg. 5})

Procedure EP-231, "Operation of Post-Accident Sampling System (PASS)", does not specify dose rate limits for PASS samples. Specific numerical guidance is not given in Procedure EP-231 but rather statements such as "acceptable dose rates" are used throughout the procedure.

Response

Emergency Preparedness procedure EP-231 has been reviewed by the Chemistry Department. The Limerick Generating Station (LGS) Chemistry Department, in conjunction with the LGS Health Physics Department, will determine PASS sample dose rate limits and will revise EP-231 to incorporate the specific dose rate limits.

This revision will be completed along with the revision of several other Emergency Preparedness procedures that will incorporate recommendations in this response letter.

The procedure revisions will be cross reviewed to ensure the actions in each procedure are coordinated without conflicts and will be completed by June 30, 1990.

ITEM 2

NRC Recommendation (Ref. 4.5.2 {pg. 5})

The samples taken during this operational test were taken with the reactor shut down. Limitations on plant operations during start-up testing have prevented the taking of samples from the reactor coolant system at operating temperature and pressure and comparing the results with samples obtained from normal system sampling points.

Response

Unit 2 reactor coolant PASS samples have been taken and compared with a routine reactor coolant sample at a sufficient operating temperature and pressure. When an adequate amount of radioactivity is present in the reactor coolant the procedure will be repeated and the results of the sample comparison will be provided to the NRC Senior Resident Inspector.

ITEM 3

NRC Recommendation (Ref. 4.7.1 (pg. 7))

The licensee's procedures for sample preparation, specifically procedures EP-241, "Sample Preparation and Handling of Highly Radioactive Liquid Samples", and EP-243, "Sample Preparation and Handling of Highly Radioactive Gas Samples", do not specify dilution criteria for sample analysis for either chemical or gamma isotopic analysis. No specific guidance is given to ensure that the diluted samples will be within the calibration range of the analytical instrumentation or contain radioactivity concentrations which will not exceed dead time limitations for the gamma spectrometer

Response

EP-241 and EP-243 will be revised by June 30, 1990. This revision will provide guidance as to ensure that diluted samples will remain within the calibrated range of the analytical instrument or not exceed the dead time limitations of the gamma spectrometer.

ITEM 4

NRC Recommendation (Ref. 4.7.2 (pg. 7))

The volume of the PASS liquid dilution valve has not been incorporated into the licensee's dilution procedure. The measured volume of this dilution valve is 0.08 ml versus the designed volume of 0.10 ml.

Response

Procedure EP-241 will be revised by June 30, 1990. This revision will incorporate the measured volume of the PASS liquid dilution valve, 0.08 ml, versus the design volume of 0.10 ml.

ITEM 5

NRC Recommendation (Ref. 4.7.3 {pg. 7})

The licensee has performed calibrations of the gamma spectrometer at source-to-detector distances of up to approximately 36 inches. This requires counting samples with the shield lid open. The licensee's assessment of radiation levels during accident conditions indicates that under certain situations the counting room will experience a exposure rate of 8-10 mR/hr from noble gas. The licensee stated that samples could not be counted under these conditions. However, the licensee's procedures do not provide specific limits on sample exposure rates so that the samples can be counted in a shield with the lid closed after purging the radioactive noble gases from the shield. This applies, in particular, to charcoal cartridge (or silver zeolite) samples which cannot be diluted.

Response

Specific sample exposure rate limits will be incorporated into procedures EP-231, EP-241, EP-243, and EP-242, "Sample Preparation and Handling of Highly Radioactive Particulate Filters and Iodine cartridges," by June 30, 1990. These procedure revisions will permit samples to be counted in a shield with the lid closed.

ITEM 6

NRC Recommendation (Ref. 4.7.4 {pg. 8})

The licensee's noble gas gamma isotopic results from a containment atmosphere sample are reported at conditions of standard temperature and pressure (STP). However, Procedure EP-C-326, "Procedures for Estimating Core Damage During Accident Conditions", requires that actual sample vial temperature and pressure to be reported so that the noble gas activity result can be corrected to containment

temperature and pressure conditions. A procedure change should be made so that the reported sample results are in the correct form to be used in Procedure EP-C-326 to assess core damage.

Response

Procedure EP-C-326 has been revised, and now includes a method to count the noble gas activity result at STP conditions to containment temperature and pressure conditions.

NOBLE GAS EFFLUENT MONITOR, ITEM II.F1-1

ITEM 7

NRC Recommendation (Ref. 5.3.1 {pg. 10})

Since the monitoring enclosure is located immediately adjacent to the top of the north stack, it is possible that under some post-accident meteorological conditions the enclosure could be permeated by radioactive gases. Their intake during a system purge would defeat the purpose of the purge by filling the idled piping. This will result in false indications when the system resets for normal operation. It is therefore recommended that a supply of clean air or inert gas be supplied to purge pathways.

Response

We consider this modification to be unnecessary. We acknowledge that the possibility exists of radiogases infiltrating into the north stack instrument room. This condition could create false indication on the low range of the Wide Range Accident Monitor (WRAM) during purges with room air. This is a standby condition during high effluent activity. However, upon recovery to the low range detector, accurate effluent readings will not be obtained for one minute and twenty-two seconds based on line length from sample tubes to detector assuming one Standard Cubic Feet per Minute (SCFM). The effects on the detector due to purge air contamination would only last fifty seconds assuming 1 SCFM. Therefore, the purge air effects will not interfere with the sample once valid data is available. We consider this modification to be unnecessary.

ITEM 8

NRC Recommendation (Ref. 5.3.2 {pg. 10})

Due to the close proximity of the monitoring enclosure to the north stack, a high radiation field is expected under post-accident conditions. Doses to technicians obtaining a backup gas sample could approach the GDC-19 criteria. The substitution of a procedure to calculate gas concentrations in the duct from survey readings near the duct would materially lower the associated doses.

Response

We acknowledge the possibility of approaching GDC-19 criteria when obtaining a backup accident gaseous effluent sample. We will develop a procedure by June 1, 1990 to evaluate the radioactive release based on dose rate readings as taken off the vent duct work. This procedure will utilize Design Basis Accident isotopic mixtures and stack flow rates to determine a total release rate.

SAMPLING AND ANALYSES OF PLANT EFFLUENTS, ITEM II.F.1-2

ITEM 9

NRC Recommendation (Ref. 6.3.1{pg. 12})

The procedure for the limitation of grab sample activity should be clarified. An alternative means of evaluating the amount of activity collected should be devised in case the activity exceeds the capability of the count room equipment.

Response

Procedure EP-237, "Obtaining the Iodine/Particulate and/or Gas Samples from the North Vent Wide Range Gas Monitor," revised to include grab sample radioactivity limitations. Methods to estimate sample radioactivity for samples which exceed counting capabilities will be evaluated by June 30, 1990. The decision resulting from this evaluation will be provided to the Sr. Resident Inspector as well as implementation plans as appropriate.

ITEM 10

NRC Recommendation (Ref. 6.3.2 {pg. 12})

Procedures for the determination of the activity collected on other than grab samples should be provided so as to establish the total activity released during a prolonged post-accident release.

Response

The LGS Technical Support Health Physicist (HP) contacted the lead NRC Inspector on March 1, 1990 to gain clarification to the phrase "other than grab samples." The lead inspector stated that this recommendation referred to "Particulate and iodine samples taken from the Wide Range Accident Monitor (WRAM) sample skid." As a result of this conversation, the recommendation is understood to state that: no guidance is provided for handling high activity particulate and iodine samples taken from the WRAM sample conditioning skid.

The appropriate EP Procedures will be revised by June 30, 1990 to provide guidance for the determination of activity collected from the WRAM sample skid. This will enable qualified personnel to establish the total amount of radioactivity released during a prolonged post-accident release.

ITEM 11

NRC Recommendation (Ref. 6.3.3 {pg. 12})

A small hand truck should be provided to facilitate the transport of the shield cask and activity samples through the level portions of the building leading to the chemistry laboratory.

Response

The Chemistry Department has ordered a hand truck to be used during the transport of the shield cask and activity samples through the level portions of the building leading to the chemistry laboratory.

ITEM 12

NRC Recommendation (Ref. 6.3.4 (pg. 12))

It appears that the location of the WRGM was chosen to minimize the length of sampling lines in accordance with the guidance of ANSI N13.1-1969. Since the promulgation of this guidance, it has been demonstrated that long (100' to 200') sampling lines with a diameter of 1" to 2" at flows of 1 to 2 CFM provide for high transmission of particulates and elemental iodines. However, long sampling lines of 1/4" piping with a flow at 0.06 CFM such as the WRGM high range flow path provide very low and uncertain transmission. Some licensees have located the WRGM in a readily accessible area with low background at some distance from the plant stack and provided for the continuous operation of the high volume pump. A flow splitter is then installed close to the WRGM and feeds a 1/4" low flow line to the mid/high range sample path.

Movement of the WRGM to a location more remote from the stack would significantly reduce the climbing hazards and transit exposures to personnel. This is also recommended in view of the time and dose constraints that are imposed on the frequency of obtaining samples from the WRGM at its present location.

Response

We acknowledge the advantages of relocating the WRAM (referenced above as WRGM) with respect to high transmission of particulates and elemental iodines, climbing hazards, and transit exposures to personnel. An evaluation is being performed to consider the benefits of relocating the WRAM to a more accessible location. This evaluation will consider worker safety, sampling accuracy and financial prudency. The evaluation is expected to be completed by May 16, 1990 and will determine our ultimate decision on relocation of the WRAM. The results of this evaluation will be provided to the NRC Senior Resident Inspector.

IMPROVED IN-PLANT IODINE INSTRUMENTATION UNDER ACCIDENT CONDITIONS, ITEM II.D.3.3

ITEM 13

NRC Recommendation (Ref. 8.3.1 (pg. 14))

The policies and procedures regarding post-accident iodine monitoring need to be improved by the addition of guidance for supervisors and technicians. Current procedures rely extensively on discretion and knowledge of the HP personnel. However, most personnel are only familiar with the hazards involved in routine operations but not with the severe conditions that may occur in plant after an accident. Information such as recommended air sample size when extremely high activity is suspected, cartridge purge guidelines, and selection of cartridge type (charcoal vs. silver zeolite) should be provided. The exposure values in General Design Criterion 19 should also be provided in the procedures as guidance in decision making.

Response

Procedure HP-213,"Airborne Activity Survey Techniques," will be revised by April 30, 1990. This revision will incorporate a recommended maximum air sample size based on dose rate constraints of laboratory equipment and realistic values for airborne activity during an accident. In conjunction with this procedure revision of air sample size, a letter to file will also be written providing the technical basis justifying the values used in the procedure.

Additionally, this revision of procedure HP-213 will include special instructions for minimizing personnel exposure below the levels listed in GDC 19. These special instructions will address conditions during the handling of air samples that are suspected to contain extremely high radioactivity. This revision of procedure HP-213 will also incorporate guidance for the selection of cartridge type (charcoal vs. silver zeolite) and instructions for the use of procedure HP-204, "Rapid Assessment of Radioiodine Concentration."

Finally, guidelines for purging silver zeolite cartridges will be incorporated into applicable chemistry sampling procedures by April 30, 1990.