Enclosure

Metropolitan Edison Company
Three Mile Island Nuclear Station, Unit 1
Operating License No. DPR-50
Nonroutine 10-Day Report 74-01

Information Regarding September 5, 6, and 7, 1974, Unplanned Releases of Radioactivity

1. Description of Incidents:

a. September 5 Incident

On September 5, 1974, the Control Room received an alarm from the particulate monitor which samples the ventilated air from the Auxiliary Building. Health Physics personnel immediately sampled the Auxiliary Building air. Only ^{133}Xe and ^{135}Xe, and ^{85}Kr and ^{88}Kr in lower concentrations, were found to be present. Operations personnel then tried to locate the source of the release, but by the time they were able to begin their search, the radiation level had decreased back to normal.

It was later determined that the cause of the incident was that the loop seal on the Miscellaneous Waste Evaporator Feed Tank had blown, thereby allowing radioactive gases to escape from the tank and the associated vent header through the blown loop seal into the auxiliary building sump. The loop seal was refilled by an auxiliary operator and the evaporator was restarted.

b. September 6 Incident

On September 6, the same auxiliary building particulate level alarm was received in the Control Room. Health Physics and Operations personnel responded as before. It was determined that the radioactive release had come through the loop seal on the Miscellaneous Waste Evaporator Feed Tank. It was found that the water in the loop seal had been blown out although the reason for this was not apparent. Following the second incident, the seal was once again refilled.

c. September 7 Incident

Prior to the third incident on September 7, a full investigation was begun to determine the cause of the two previous loop seal blowouts, but before this investigation could be completed, the seal was blown out again. This time the loss

of sealant was attributed to a trip of a Miscellaneous Evaporator Feed Tank pump in that when the feed pump no longer took suction on the feed tank, the level increased at a rate which was sufficient to increase the air pressure above the liquid in the tank to a point where the loop seal was blown. The trip of the evaporator feed pump could not, however, be attributed to having caused either of the first two incidents.

d. General Comment Regarding All Three Incidents

During the course of the three incidents, no personnel over-exposures occurred although a total of four people were exposed to liquids and gases of higher than normal radio-activity levels

2. Designation of Apparent Cause of Incidents:

Following consultations with the Architect Engineer, it has been determined that the blowing of the loop seal in the case of all three incidents was due to inadequate design, in that the as-built system is not capable of handling normal operating pressure transients.

3. Safety Analysis:

For the following reasons it is believed that the unplanned releases of radioactivity from the loop seal did not endanger the health and safety of the public:

a. During all three incidents, at no time were the releases significant with respect to the limiting conditions of the Technical Specifications.

b. A thorough monitoring of the four station personnel directly exposed to the releases showed no detectable levels of ingested radioactive material due to these incidents. This, together with a review of the conditions to which they were subjected, has resulted in a determination that these four individuals were not exposed to harmful levels of radioactivity; and for all practical purposes, it is impossible for the public to have been exposed to radiation which was more intense than this.

4. Corrective Actions:

In addition to those corrective actions mentioned in part 1. above, the overflow leg of the loop seal was plugged immediately following the September 7 incident; and this plug will remain in place until design modifications of the seal have been completed (described in section 5. below); and any overpressure in the feed tank will be relieved to the vent header which is valved to the feed tank during evaporator operation.

5. Preventative Action:

The Plant Operations Review Committee (PORC) convened after each of the three incidents and, together with the Station Superintendent, approved of all corrective actions previously described in this report. In addition, PORC recommended that preventative action be taken to redesign and modify the loop seal piping and valve system in such a way that blowout, siphoning, and backsurge will be prevented while overflow protection of the evaporator will still be afforded.

The Station Superintendent concurred with these recommendations and has taken steps to ensure their completion. It is presently anticipated that modification of the loop seal will be executed shortly after completion of the required design studies.

6. Failure Data:

Not applicable.