THREE MILE ISLAND NUCLEAR STATION

UNIT #2 EMERGENCY PROCEDURE 2202-1.6 HIGH ACTIVITY IN REACTOR COOLANT Table of Effective Pages

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THREE MILE ISLAND NUCLEAR STATION UNIT #2 EMERGENCY PROCEDURE #2202-1.6 HIGH ACTIVITY IN REACTOR COOLANT

1.0 SYMPTOMS

- 1.1 Alarm on R.C. Letdown Radiation Monitor MU-R-720.
- 1.2 High Gross Beta Gamma activity <u>during steady state power operation</u> as determined from 15 minute degassed Gross Beta Gamma sample analysis (higher than normal by a factor of two).
- 1.3 An increase in I¹³¹ activity by a factor of two <u>during steady state</u> power operation, as determined by gamma spectroscopy.
- 2.0 IMMEDIATE ACTION
- 2.1 Automatic Action

None

- 2.2 Manual Action
- 2.2.1 Notify the Shift Supervisor.
- 2.2.2 If due to MU R 720 Alarm, or high activity in routine analysis, sample and run gamma (DEI) spectrum analysis, and a <u>15 minute</u> gross β-1 degassed activity analysis. Calculate the Dose Equivalent Iodine concentration.
 - NOTE: If major plant evolutions such as heatup, cooldown or abnormal pressure temperature transients are in progress, high activity levels can be experienced due to the release of irradiated corrosion products.
- 2.2.3 If no unit evolutions are in progress that would cause a crud burst and Hi activity is confirmed by a 15 minute gross activity >20 µCi/m1, reduce reactor power to less than 50%.

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<u>NOTE</u>: If during a power transient, a gamma spectrum analysis indicates an increase in fission products (eg I^{131}) no immediate action need be taken. (I^{131} will change by a factor of 10 during normal operations). 3

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- 3.0 FOLLOW-UP ACTION
- 3.1 If 15 minute degassed Gross Beta Gamma activity result is greater than 10uCi/ml immediately start E activity determination.
 - NOTE: An E activity determination consists of a quantitative measurement of 95% of radio nuclides in reactor coolant with half lives greater than 30 minutes.
- 3.2 If the Dose Equivalent I^{131} is >1.0 µCi/gram but within allowable limit of the Technical Specifications, operation may continue for . up to 48 hours (T.S. 3.4.8).
- 3.3 If the Dose Equivalent I^{131} is >1.0 µCi/gram for more than 48 hours during one continuous time interval, or it exceeds the limit outlined in the Technical Specifications, shutdown the reactor and decrease Tave to <530⁰F within 6 hours. (T.S. 3.4.8).
- 3.4 If results of anaylsis indicate total activity due to nuclides with half lives longer than 30 minutes exceed or will exceed $100/\overline{E}$ µCi/ml, be in HOT STANDBY with Tave <530°F within 6 hours.
- 3.5 If the specific activity exceeds 1.0 μ Ci/gram Dose Equivalent I¹³¹ or 100/E μ Ci/gram, analyze for Iodine, including I¹³¹, I¹³³, and I¹³⁵ once per 4 hours until the activity is restored to within its limits. (T.S. 3.4.8).
- 3.6 Increase sampling frequency as follows:

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- a. If the monthly radio chemical analysis results are greater than 10% of the allowable maximum activity for reactor operations (100/E uci/ml), the monthly radiochemical sample frequency must be increased to 5 times/week.
- b. An E determination which is normally performed semi annually will be started when the 15 minute gross degassed activity analysis indicates greater than 10 µci/ml and will be redetermined for each 10 µci/ml increase in the 15 minute gross degassed activity analysis.
- 3.7 Attempt to determine whether fuel element failure exists, by using the $I^{131} I^{133}$ and Cs $^{137} Cs$ 138 ratios and other radionuclide analysis, such as Gross Alpha activity.

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