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Unit 1 Staff Recommends Approval
Approval: [NA]  Date: [__]  Cognizant Dept. Head

Unit 2 Staff Recommends Approval
Approval: [NA]  Date: [__]  Cognizant Dept. Head

Unit 1 PORC Recommends Approval
Chairman of PORC: [__]  Date: [__]

Unit 2 PORC Recommends Approval
Chairman of PORC: [__]  Date: 11/14/77

Unit 1 Superintendent Approval
[NA]  Date: [__]

Unit 2 Superintendent Approval
[__]  Date: 11/15/77

Manager Generation Quality Assurance Approval
[NA]  Date: [__]

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**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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**Revision History**

- **Revision 1**
- **Revision 2**

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**Chairman of PORC**

**Date: 06/08/77**

**Date: 11/15/77**
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 during steady state power operation
   as determined from 15 minute degassed Gross Beta Gamma sample
   analysis (higher than normal by a factor of two).
1.3 An increase in I\textsuperscript{131} activity by a factor of two during steady state
   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 15 minute
       gross \beta-\gamma 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
       \textgreater{}20 \textmuCi/ml, reduce reactor power to less than 50%. 

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NOTE: 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).

3.0 FOLLOW-UP ACTION

3.1 If 15 minute degassed Gross Beta Gamma activity result is greater than 10µCi/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 <530°F within 6 hours. (T.S. 3.4.8).

3.4 If results of analysis indicate total activity due to nuclides with half lives longer than 30 minutes exceed or will exceed 100/E µCi/ml, be in HOT STANDBY with Tave <530°F within 6 hours.

3.5 If the specific activity exceeds 1.0 µCi/gram Dose Equivalent I$^{131}$ or 100/E µCi/gram, analyze for Iodine, including I$^{131}$, I$^{133}$, and I$^{135}$ 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:
a. If the monthly radio chemical analysis results are greater than 10% of the allowable maximum activity for reactor operations ($100/E \mu\text{ci/ml}$), 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 $\mu\text{ci/ml}$ and will be redetermined for each 10 $\mu\text{ci/ml}$ increase in the 15 minute gross degassed activity analysis.

3.7 Attempt to determine whether fuel element failure exists, by using the $^{131}\text{I} - ^{133}\text{I}$ and $^{137}\text{Cs} - ^{138}\text{Cs}$ ratios and other radionuclide analysis, such as Gross Alpha activity.