Procedure for the check of the Operation and Response of the Water Activity Monitor System for the AGN-211 Nuclear Reactor

Frequency - every 6 months (to be done in conjunction with the calibration check of the Water Monitor ratemeter system)

A. Specification

The Water Activity Monitor consists of a NaI(Tl) detector and preamp connected to a ratemeter. The NaI(Tl) detector is mounted inside a cylinder constructed of aluminum through which the outlet water from the reactor pool passes. This procedure will be used to check the operation of the entire Water Monitor System to ensure that it will respond to a known gamma activity, will produce a known reading and will cause a reactor scram condition to occur.

B. Procedure to be used to check the system

1) The calibrated gamma (G-331) source will be placed in the proper position for the response check. The proper position will be the hole drilled into the small wooden block inserted in a lead brick. This lead brick is located on the top of the shield.

2) Calculate the reduction in radiation intensity due to decay since the last calibration check.

3) Record the response of the Water Monitor Ratemeter in CPM. The response should be within ± 20% of the last response corrected for decay.

4) Log the results of the calibration check on the documentation sheet, If the response of the system is not within the specified limits, notify the Reactor Supervisor.

Documentation Sheet for the Calibration
of the Water Monitor Ratemeter and the
System Operational Response check

A) Ratemeter and Preamplifier tests and checks.

1) Mechanical meter zero _____.

2) Electrical zero check _____.

3) System High Voltage check _____.

4) 3600 CPM test _____.

5) Pulse generator frequency check

Range(CPM)	Pulse Generator Output(PPS-CPM)	Meter Reading(CPM)	Comments
100	1.0 - 60		
200	1.0 - 60		
200	2 - 120		
500	2 - 120		
1k	10 - 600		
2k	10 - 600		
2k	20 - 1,200		
5k	20 - 1,200		
10k	20 - 1,200		
10k	100 - 6,000		
20k	100 - 6,000		
20k	200 - 12,000		
50k	200 - 12,000		
100k	1,000 - 60,000		
200k	1,000 - 60,000		
200k	2,000 - 120,000		
500k	2,000 - 120,000		

6) Discriminator check _____.

7) Preamplifier gain test _____.

8) Ratemeter returned to standard operating configuration _____.

Water Monitor System Response Check

1) Cs-137 source (27.5mCi on 3-19-63) activity in mCis _____.

2) Cs-137 source activity at time of last test _____.

3) % of change in Cs-137 activity _____.

4) Ratemeter response

   a) _____ CPM on the _____ range.

   b) _____ CPM on the _____ range.

5) Previous ratemeter response

   a) _____ CPM on the _____ range.

   b) _____ CPM on the _____ range.

6) % change in response _____. Response to be within ±20% of last reading corrected for decay unless Water Monitor system has been changed then describe system change: _____

_____

_____

_____

7) Does the Water Monitor System cause a scram condition to occur when the ratemeter countrate exceeds the Water Monitor Scram set point? _____.

8) Calibration and Response tests performed by _____ on _____.