Heavy Water Reflector Element and Tank Inspection Procedure

Objective: To assure the proper procedure is followed for the removal, inspection, venting, and reassembly of heavy water reflector vessels in the reactor during the biennial core inspections and at other times as necessary.

Procedure:

1. Check out the reactor and withdraw the safety rod but do not go to power. Maintain an operator at the console at all times during which a positive reactivity insertion may occur.

2. If not done previously (i.e., if this procedure is not being done as a part of the biennial inspections), remove two fuel elements from the B-hexagonal ring (worth ≡ - $2.50, see Kimura, p. 71, and place in storage during inspection. Record movement in Operations Log and below.

Preplanned Fuel Movement Sequence

Element No.	Position From:	Position To:
1- _____	_____	_____
2- _____	_____	_____

3. Remove the heavy water (D_2O) reflecting elements from core and tank storage rack locations. Survey each element upon removal from the reactor tank and record the maximum radiation level in Operations Log. For each element, unscrew the drain plug at the top of the element to vent into the hood in Room 1205-F any generated gases and check the level of D_2O within the element. Add makeup D_2O if the level is less than two inches from the top of the element. Observe the condition of the cladding and measure using calipers the diameter of the element at each position shown on the Biennial Heavy Water Inspection Sheet (Form NEL-010). Record the inspection for each element on the appropriate inspection sheet.

4. Return each inspected element to its original position in the core or storage rack and record in the Operations Log.

5. Remove the dry tube irradiation canister from the D_2O trapezoidal tank and secure to the side of the reactor tank or remove from the reactor tank as necessary for inspection of the polyethylene tubing. Survey the dry-tube canister upon removal from reactor tank and record maximum radiation levels below:

   _____ mR/hr at one foot
   _____ mR/hr on contact

   Replace the polyethylene tubing section immediately next to the

canister if radiation damage (embrittlement) is observed. Record actions in Operations Log.

6. Remove trapezoidal D_2O reflector tank from core and reactor tank using the special grasping tool attached to rope. Survey the tank upon removal for maximum radiation levels and record below. Prepare standard radiation tag and attach to tank with the readings indicated on the tag.

   _____ mR/hr at one foot
   _____ mR/hr on contact

   Observe the condition of the surface of tank for corrosion or any abnormal appearance. Vent the tank into the hood in MEB 1205-F by removing the filling screw. Check the level of D_2O inside the tank and add makeup D_2O if necessary. Record inspection in Operations Log. If necessary or as directed by Reactor Supervisor, take 1cc sample of D_2O for tritium monitoring by liquid scintillation counting. Indicate reading here: _____ µCi/ml (tritium). Compare to 10CFR20 appendix B, Table I/water): 0.1 µCi/ml.

7. Return the D_2O tank to its original core position and record in Operations Log.

8. Replace the dry tube canister in D_2O tank and secure the top of the tube to the supporting beam across the top of the TRIGA tank. Record in Operations Log.

9. Date inspection completed: _____

10. Senior Reactor Operator: _____

Form approved by Reactor Safety Committee:

Reactor Administrator: Antoinette K Gehnulich Date: May 25,1988