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December 12, 1978

Mr. D. L. Ziemann, Chief
Operating Reactors - Branch 2
Division of Operating Reactors
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: Dresden Station Units 2 & 3
Exemption Request from 10 CFR 50, Appendix J, Section III.A.1.(d) Regarding Flooding the Reactor Vessel During the IPCLRT
NRC Docket Nos. 50-237/249

Dear Mr. Ziemann:

During the last Dresden Unit 3 refueling outage, Spring 1978, the station performed an integrated primary containment leak rate test (IPCLRT). Problems were encountered with measuring the temperature and relative humidity in the subvolume bounded by the water level above the core and inside of the reactor vessel head. The free air space of this subvolume was assumed to be at the same temperature as that of the water in the vessel and at a saturated condition (100% relative humidity). Once the temperature of the reactor water is known the dry air temperature and dew point temperature become known. Therefore, to obtain this temperature, RTDs were placed in the shutdown cooling loop to measure the temperature of the water returning to the vessel. Because of a valve line-up error, the water was bypassing the vessel causing the temperature in the vessel to increase. During this time, however, the RTDs were still measuring the water leaving the shutdown cooling loop and not the water in the vessel. A negative leak rate was calculated because the containment temperature was increasing. The valve line-up error was corrected and the containment stabilized. (See Attachment 1).

The most effective way to alleviate problems like this and to perform a more accurate type A IPCLRT is to eliminate the subvolume. By raising the reactor water level

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to the top of the vessel, the elimination of the subvolume is accomplished. The raising of reactor water level will cover the following lines and valves with water:

1.	203-1	A, B, C, D	MSIV
2.	203-2	A, B, C, D	MSIV
3.	220-1		MSIV Drains
4.	220-2		MSIV Drains
5.	2301-4		HPCI
6.	2301-5		HPCI
7.	1301-1		Isolation Condenser
8.	1301-2		Isolation Condenser

Flooding of the reactor vessel will not represent ideal conditions as specified in Appendix J. However, all the valves which will not be properly drained and vented during the IPCLRT will be local leak rate tested at the accident pressure of 48 psig. We believe an accurate total containment leakage can be calculated if the results of the local leak rate tests are added to the results of the type A test. We, therefore, request an exemption from 10 CFR 50, Appendix J, Section III. A.1.(d). It is our intention, if the exemption is granted, to perform the test as described above during the upcoming Dresden Unit 2 March 1979 refuel outage.

One (1) original and thirty-nine (39) copies of this transmittal are provided for your use.

Very truly yours,

M. S. Turbak

M. S. Turbak
Nuclear Licensing Administrator

attachment

ATTACHMENT I

CONTAINMENT STABILIZATION

G.1 Reactor Heating

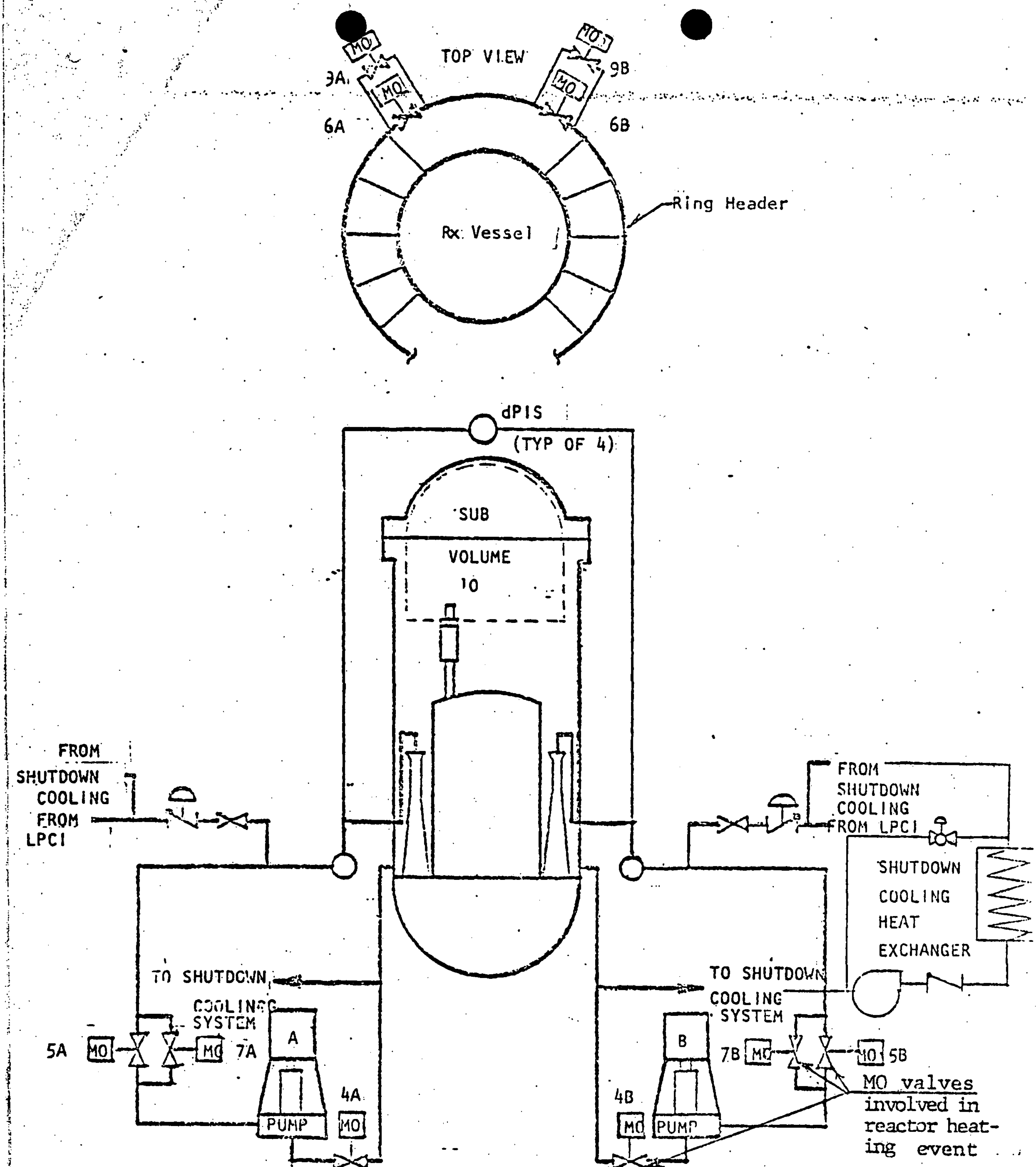
The U-3 primary containment stabilized at test pressure from 1805 hours on 4/30/78 to 0730 on 5/2 /78. After stabilization the test pressure was maintained throughout the 12 hour portion of the ILRT. Depressurization did not occur until after completion of the induced portion of the ILRT. Containment stabilization lasted for over twenty-seven hours. During this stabilization period, data was taken to monitor containment temperature, pressure, and leakage. All calculations indicated a negative containment leakage.

The cause for the negative containment leakage was discovered at 1530 hours on 5/1/78. It was found that because shut down cooling water was not flowing through the reactor core, the reactor temperature was higher than required. The reactor vessel head flange temperature was greater than 300°F. It was concluded that what appeared to be a negative containment leakage was actually due to the affect that high containment temperatures and relative humidities had on calculated contained mass through time. Mass was being added to the containment atmosphere as steam poured through the vented reactor head.

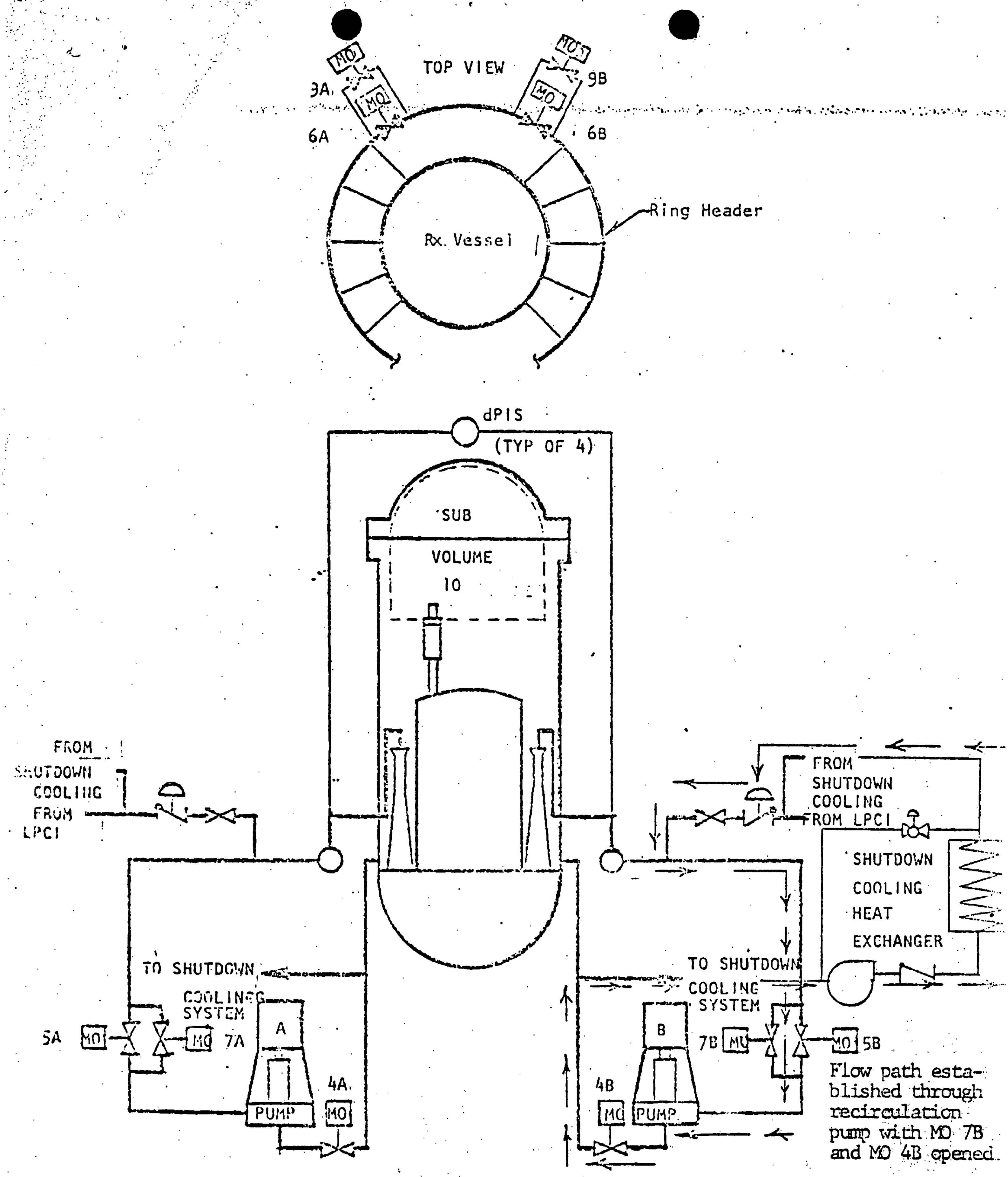
Events which caused the reactor to reach unexpectedly high temperatures occurred early in the test. Maintenance activities and the implementation of operating procedures dealing with shut down cooling and recirculation system valving combined to create a series of actions which prevented cooling water from passing through the reactor core. Diagrams G.1.a,b,c, indicate the valves and flows involved in the reactor heating event. Please note on G.1.a that MO 7B, MO 5B, MO 7A, and MO 5A are on the discharge side of pumps B and A respectively while valves MO 4B and MO 4A are on the suction side of the pumps.

In order to protect the recirculation pumps from cavitation damage, the recirculation system logic gives a trip signal to the pump motor if the suction valve is closed and the pump gets a start signal. When the maintenance department changed the brushes on "A" and "B" motor generator sets, the pump suction valves were opened to satisfy the trip logic and allow the drive motor to be run. Maintenance then opened the generator field breaker to allow running the MG sets without energizing the recirculation pump motors. This allowed the new brushes on the motor generator sets to "Break In" during a no load condition. In this manner, maintenance was able to run the motor generator sets for the required "Break In" time. After the test was completed, the suction valves were left in the open position. Since existing operating procedures did not specify proper valve line up to prevent loss of shutdown cooling, the reactor core reached unexpectedly high temperatures.

Although Dresden Operating Procedure 202-4, Reactor Recirculation System Shut Down, specifies that MO 202-5 A & B (the pump main discharge valves) be closed, MO 202-7 A & B are left open, thereby allowing shut down cooling water to take the flow



SHUTDOWN COOLING
AND
RECIRCULATION SYSTEM SCHEMATIC



SHUTDOWN COOLING
AND

path indicated in Diagram G.1.b. The problem could have been prevented if the suction valve referenced in Dresden Operating Procedure 1000-3, Shut Down Cooling Mode of Operation, had been chosen. Previously a note was added to this procedure to prevent reactor heating. The note stated that pump suction valve (MO 202- 4A or B) or discharge valve (MO 202- 5A or B) must be closed in order to insure that flow is established through the reactor vessel and not through the idle pump. It can be seen on Diagram G.1.c that if MO 202- 4A or B had been closed the flow would have been directed through the reactor fulfilling the intent of the DOP 1000-3 note. However, because the operator had a choice between MO 202- 4A or B, and MO 202- 5 A or B, the MO 202-5 valve was closed, and an improper flow path resulted. See Figure G.1.b. Since the operator chose to close MO 202-5, the flow path indicated in diagram G.1.b existed, and reactor temperature exceeded 300^{o}F.

G.2 Sensor Relocation

A re-analysis of sensor location was performed during the stabilization period of the Integrated Leak Rate Test. The analysis was completed by Dresden personnel familiar with ILRT activities.

Section G.1 stated that reactor temperature was at one point greater than 300^{o}F because shut down cooling flow was directed through an idle recirculation pump and not the U-3 reactor. Since the representative temperature of subvolume 10, which is indicated in diagram G.2.a, was taken from "A" shut down cooling loop, an accurate temperature sensor had to be found which represented thermal conditions above the reactor core. The decision was made to use a recently calibrated temperature recorder. Since the recorder was calibrated using transfer standards, traceable to the National Bureau of Standards on 3/11/78, the reactor head flange temperature was considered to be an accurate representation of subvolume temperature.