

MAY 11 1994

Docket Nos. 50-321, 50-366
License Nos. DPR-57, NPF-5
EA 94-064

Georgia Power Company
ATTN: Mr. J. T. Beckham, Jr.
Vice President, Plant Hatch
Nuclear Operations
P. O. Box 1295
Birmingham, AL 35201

Gentlemen:

SUBJECT: ENFORCEMENT CONFERENCE SUMMARY
(NRC INSPECTION REPORT NOS. 50-321/94-09 AND 50-366/94-09)

This letter refers to the Enforcement Conference held at our request on April 29, 1994, at the Region II office in Atlanta, Georgia. This meeting concerned activities authorized for your Hatch facility. The issues discussed at this conference related to an inadvertent loss of shutdown cooling flow that resulted in an increase in reactor coolant temperature and pressure. A list of attendees and a copy of your handout are enclosed.

Following Georgia Power Company's presentation at the enforcement conference, we recognized that procedure changes were made. We believe your sensitivity to shutdown decay heat issues has been increased as evidenced by your commitment to increase the frequency of monitoring shutdown decay heat removal parameters during periods of high decay heat; to conservatively revise your outage planning and scheduling philosophy to require that both loops of the Residual Heat Removal System be available until the reactor cavity is flooded; and to revise guidance on monitoring reactor pressure. Based on the information provided at the enforcement conference, the NRC has concluded that there were no violations, and therefore, no enforcement action will be taken.

In addition, during the enforcement conference, you provided the NRC with a copy of Inspection Report Number 50-321, 366/94-09 which contained some hand-written comments. We have evaluated the proposed comments and have concluded that they were minor in nature and did not affect the conclusions presented in the Inspection Report. A copy of the hand-written comments is included as Enclosure 2 to this letter. A list of attendees is provided as Enclosure 3.

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PDR ADOCK 05000321
G PDR

TELL

MAY 11 1994

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in the NRC Public Document Room.

Should you have any questions concerning this letter, please contact us.

Sincerely,

Original signed by
Jon R. Johnson, Acting Director
Division of Reactor Projects

Enclosures:

1. Enforcement Conference
Presentation Material
2. Inspection Report 50-321, 366/94-09
(with hand-written corrections)
3. List of Attendees

cc w/encls:

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cc w/encls: Continued page 3

Georgia Power Company

3

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fr PSkinner
05/06/94

RII
MS
MSirkule
05/6/94

RII
fr for
Boryc
05/6/94

LOSS OF SHUTDOWN COOLING HATCH UNIT 2

GPC PRESENTATION

TO NRC STAFF

H. L. Sumner, Jr.

General Manager, Plant Hatch

AGENDA

1. Purpose of Meeting
2. Event Description
3. Comparison To 4/14/93 Event
4. IR 94-09 Issues
5. Safety Assessment
6. Corrective Actions
7. Conclusions

PURPOSE OF MEETING

1. Respond to NRC April 8, 1994 request to discuss the loss of SDC event that occurred March 17, 1994
2. Address concerns stated in the report that resulted in the issuance of the potential violations
3. Provide GPC assessment of the safety significance of the event
4. Identify any errors in the report
5. Identify corrective actions that will result in an improved response to this event should it occur again in the future

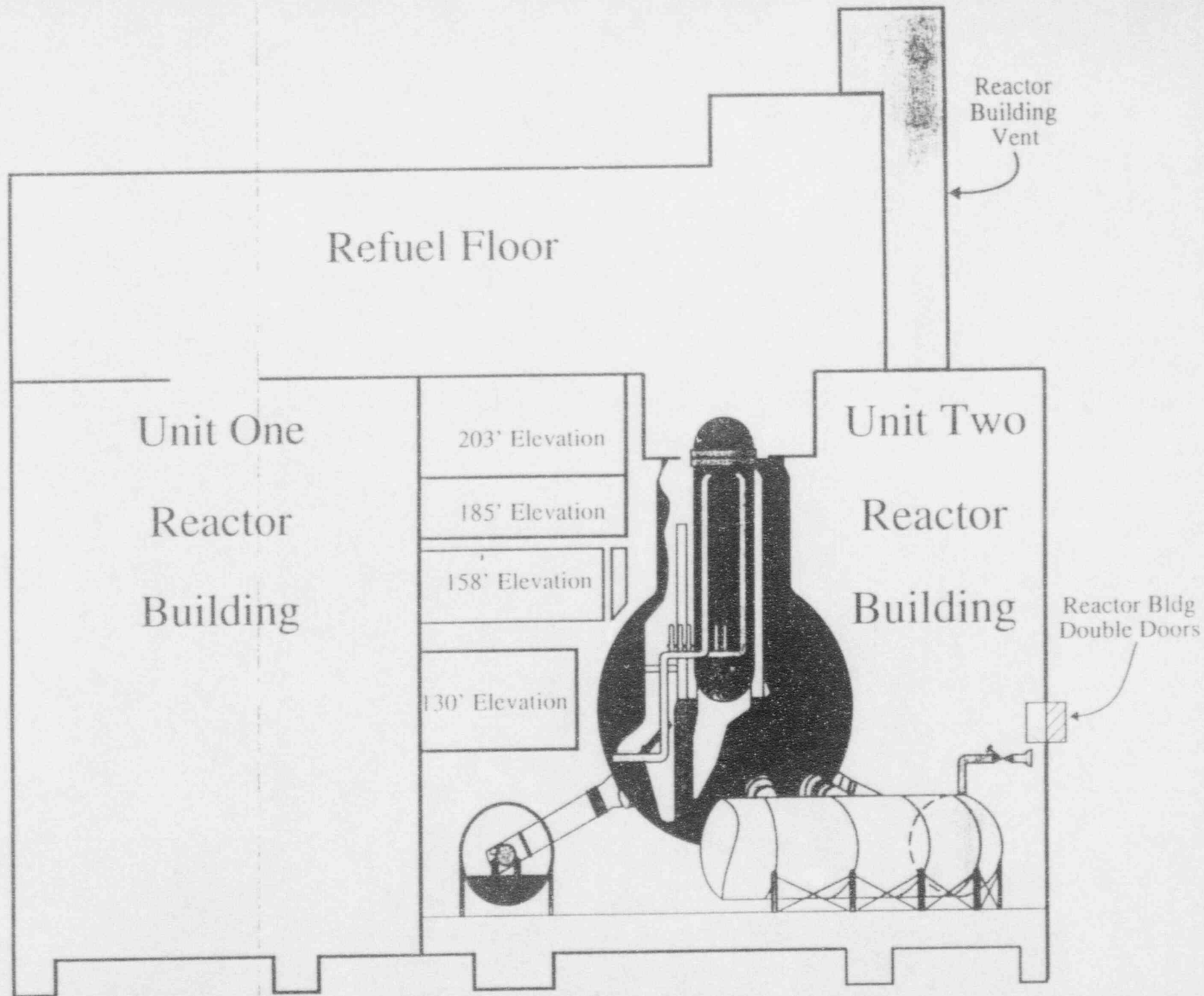
EVENT OVERVIEW

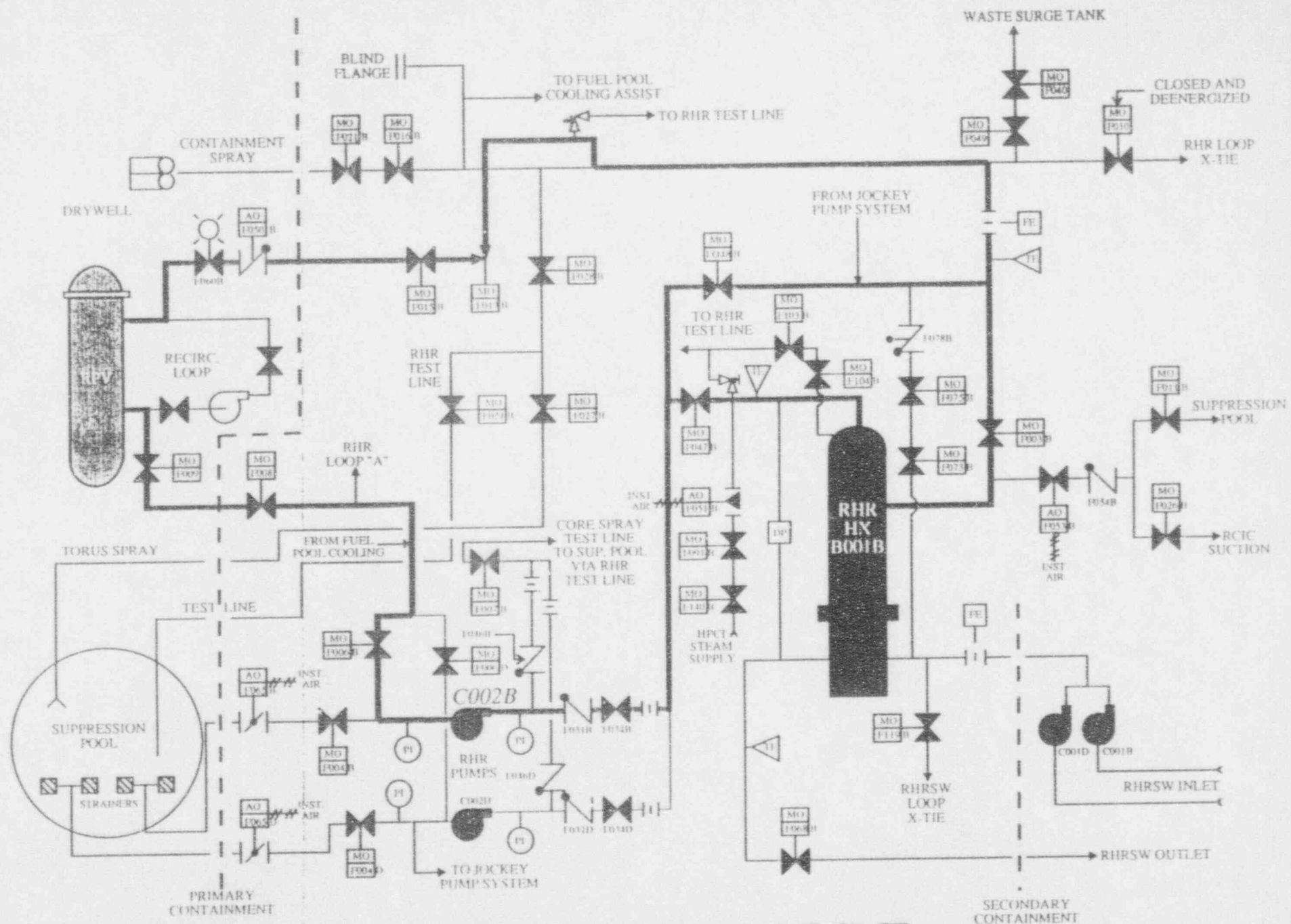
- March 17, 1994, 1131 EST
- Shutdown Cooling flow was interrupted due to closure of valve 2E11-F015B
- Within 9 minutes, shift crew became aware of the condition
- Shutdown Cooling flow was reestablished by 1255 EST
- Maximum temperature (indicated) and pressure during event was 195°F and 9.1 psig, respectively
- Event Cause:
 - Engineer moved wire bundle
 - Wire strand contacted ground

EVENT DESCRIPTION

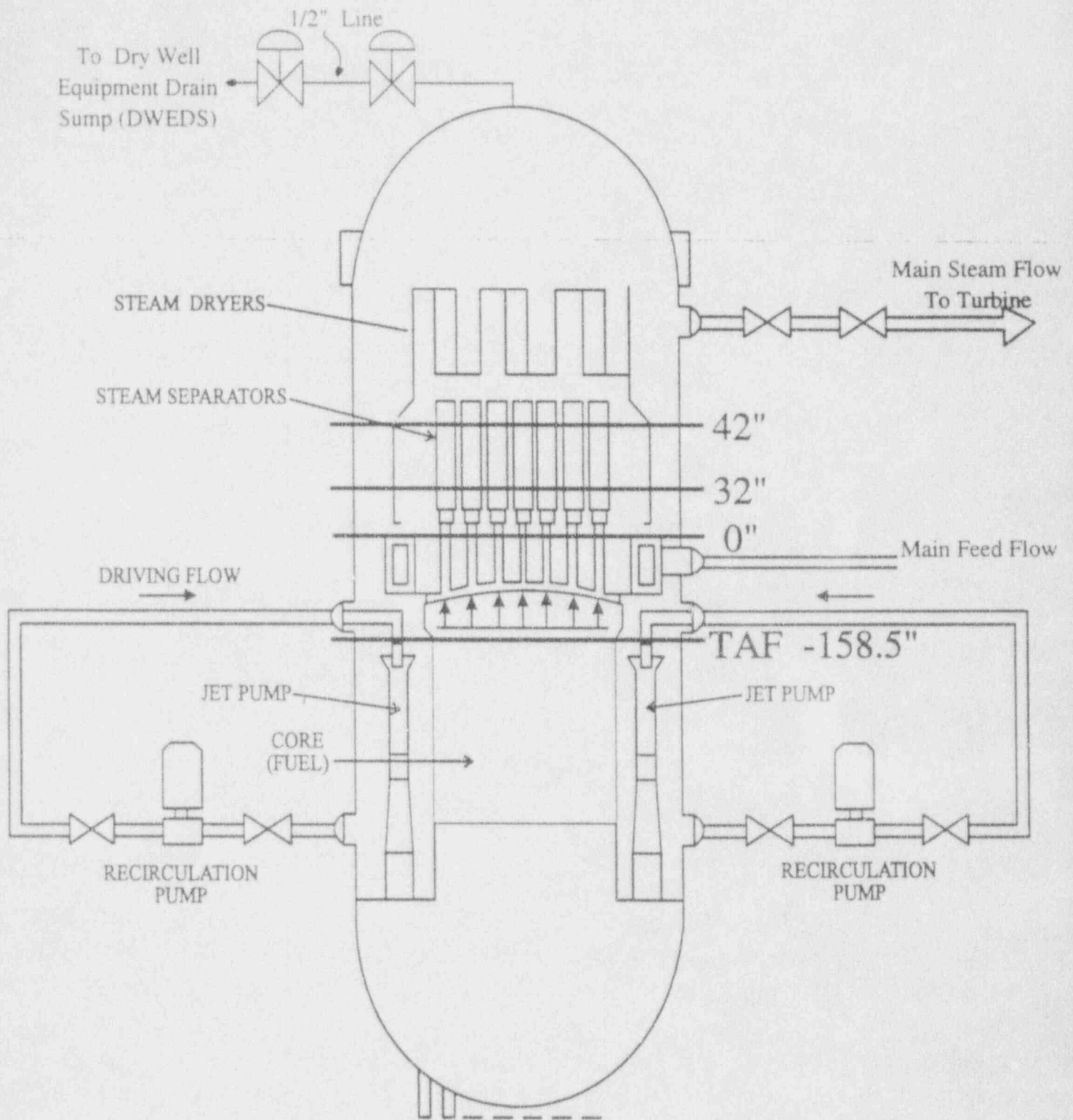
INITIAL CONDITIONS

1. Day 2 of a 42 day outage
2. Unit 2 Reactor in Cold Shutdown
3. Unit 2 Drywell part of Unit 1 Secondary Containment
4. Reactor Pressure Vessel (RPV) intact
5. Unit 2 Secondary Containment equipment door open
6. 'B' loop of RHR in Shutdown Cooling
7. RHR heat exchanger inlet temperature = 170°F
8. Reactor water level within normal band





RHR SDC MODE



EVENT DESCRIPTION

INITIAL CONDITIONS

9. 2A, 1B, and 2C Diesel Generators operable and Class 1E buses on normal supply

10. Alternate systems available for SDC:

'A' Loop RHR

'A' Loop Core Spray

'B' Loop Core Spray

Reactor Water Cleanup System (In Service)

Control Rod Drive System (In Service)

EVENT DESCRIPTION

EVENT SEQUENCE

<u>Time</u>	<u>Δt</u>	<u>Event</u>
(3/16/94)	(d:h:m)	
0149	-1:9:40	Preplanned manual reactor scram is inserted on Unit 2 in accordance with 11th refueling outage schedule.
(3/17/93)		
0254	- 8:37	Unit 2 is in cold shutdown.
1054	-:37	Cold shutdown checks performed per 34GO-OPS-015-2S.
~1115	-:16	Engineer enters back panel 2H11-P623 with SS permission and begins inspection of control panel wiring.
1131	0	Engineer slightly moves wire bundle in order to read wiring label, recognizes that some relays in the panel changed state and notices an arc.

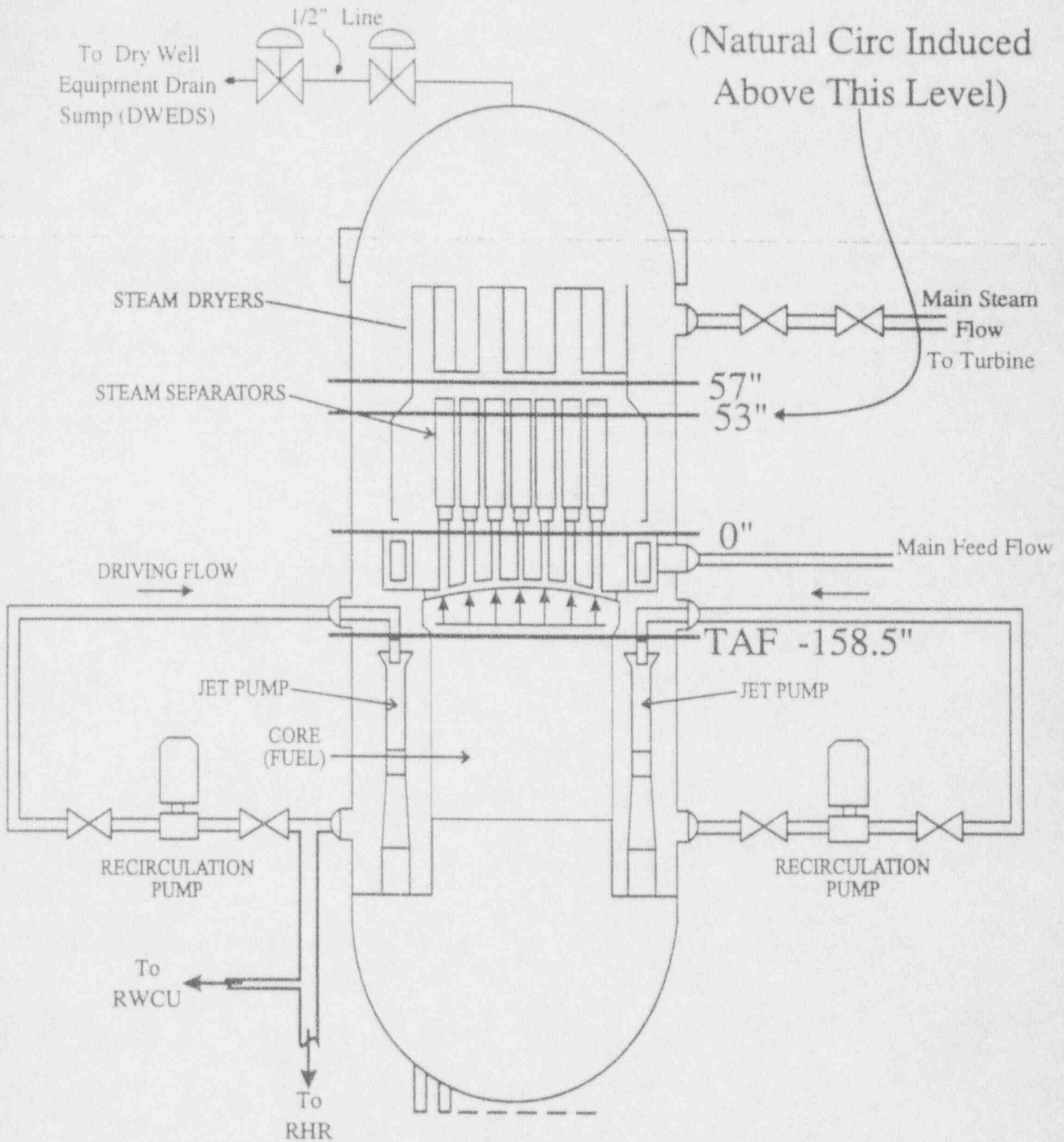
Engineer leaves the panel and notifies the SS of what he observed. The SS goes to the panel with the engineer to look for evidence of an arc.

Finding no evidence of the arc, the SS returns to the front panel area and directs the operators to walk down the control board panels looking for possible effects of the relay actuations and arcing. Almost immediately, the Mechanical Vacuum Pump is found to be tripped.

EVENT DESCRIPTION

EVENT SEQUENCE

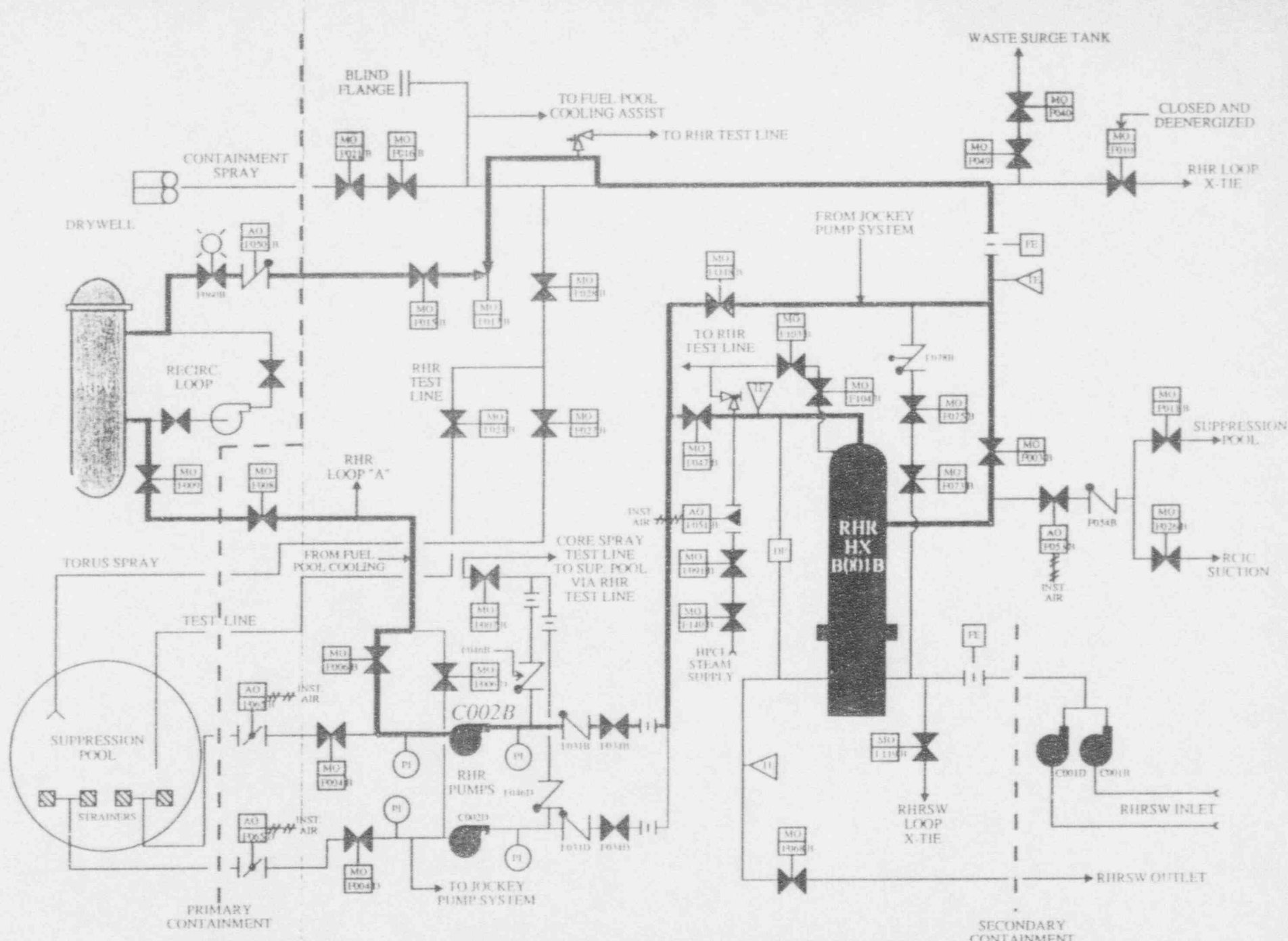
<u>Time</u>	<u>ΔT</u>	<u>Event</u>
~1140	:09	Operator finds 2E11-F015B closed and RHR flow reading zero.
1141	:10	Operator attempts to reopen 2E11-F015B with the control switch. The valve opens and cycles closed. An attempt is made to reset the isolation signal with the reset switch.
1142	:11	Operator again attempts to reopen 2E11-F015B, again the valve opens and cycles closed. At this point, it became apparent that the valve had a sealed in isolation signal which could not be reset.
1143	:12	Operator trips the running RHR pump (2B) since a flow path is not available.
~1145	:14	Crew begins to look for the cause of the isolation signal to valve F015B. Engineers and electricians are called to assist. 34AB-E11-001-2S, Loss of Shutdown Cooling, is entered.
~1150	:19	SS confirms the breaker for the 'B' RHR logic is closed in.
1158	:27	Operator begins raising reactor water level to >53" to induce natural circulation as required by the abnormal operating procedure.
~1200	:29	SS directs operators to make preparations to put 'A' loop of RHR in SDC mode.



EVENT DESCRIPTION

EVENT SEQUENCE

<u>Time</u>	<u>ΔT</u>	<u>Event</u>
1202	:31	2E11-F017A is closed to begin lineup for SDC.
~1240	1:09	Due to observed heatup via vessel metal temperatures and by RWCU inlet temperature (185°F), SS directs that 'A' loop not be flushed prior to placing it in service.
1250	1:19	RHR pump 2A on in SDC mode; forced circulation is restored.
1251	1:20	Process computer printout showed highest pressure (9.1 psig) occurred at this time.
1255	1:24	RHR Loop 'A' heat exchanger outlet valve is open; forced shutdown cooling is restored.
1256	1:25	Process computer printout showed highest RWCU inlet temperature is reached at this time (195°F).
1325	1:54	Having found fuse 2A71B-F22 blown, fuse is replaced and isolation signal is reset.



RHR SDC MODE

EVENT DESCRIPTION

PLANT RESPONSE

1. Reactor coolant temperature increased to 195°F (indicated) and 210°F (calculated), but remained < 212°F
2. Reactor pressure increased to 9.1 psig
3. The core remained covered by approximately 18 feet of water

COMPARISON WITH 4/14/93 EVENT

	1993	1994
Plant Condition	23 Bundles Loaded, Cavity Flooded	RPV Intact, Normal RWL
Time Since S/D	30 days	1.4 days
Unit/Loop/Valve	1/B/F015B	2/B/F015B
Initiating Event	Modification in Panel Resulting in Ground/Blown Fuse	Visual Inspection in Panel Resulting in Ground/Blown Fuse
Personnel Response	Shift Not Informed of Arc in Panel	Shift Immediately Informed of Arc in Panel
Frequency of CSD Checks	Once per 4 Hours	Once per Hour
Time to Discovery	1 hr 25 min	9 min
Time to Restore	2 hrs 58 min	1 hr 24 min
Method of Discovery	CSD Checks	Panel Walkdown

COMPARISON WITH 4/14/93 EVENT

	1993	1994
Temp Change	None	25°F
Pressure Change	None	9.1 psig

IR 94-09 ISSUES

1. Sensitivity to SDC Vulnerabilities

2. Procedure Adequacy

- Frequency of Cold Shutdown Checks
- Procedural Guidance, including that found in:

34AB-E11-001-2S, "Loss of Shutdown Cooling"

34GO-OPS-015-2S,
"Maintaining Cold Shutdown or Refueling Condition"

for Monitoring Plant Parameters in Cold Shutdown with respect to SIL 357, "Control of Reactor Vessel Temperature/Pressure During Shutdown."

IR 94-09 ISSUES

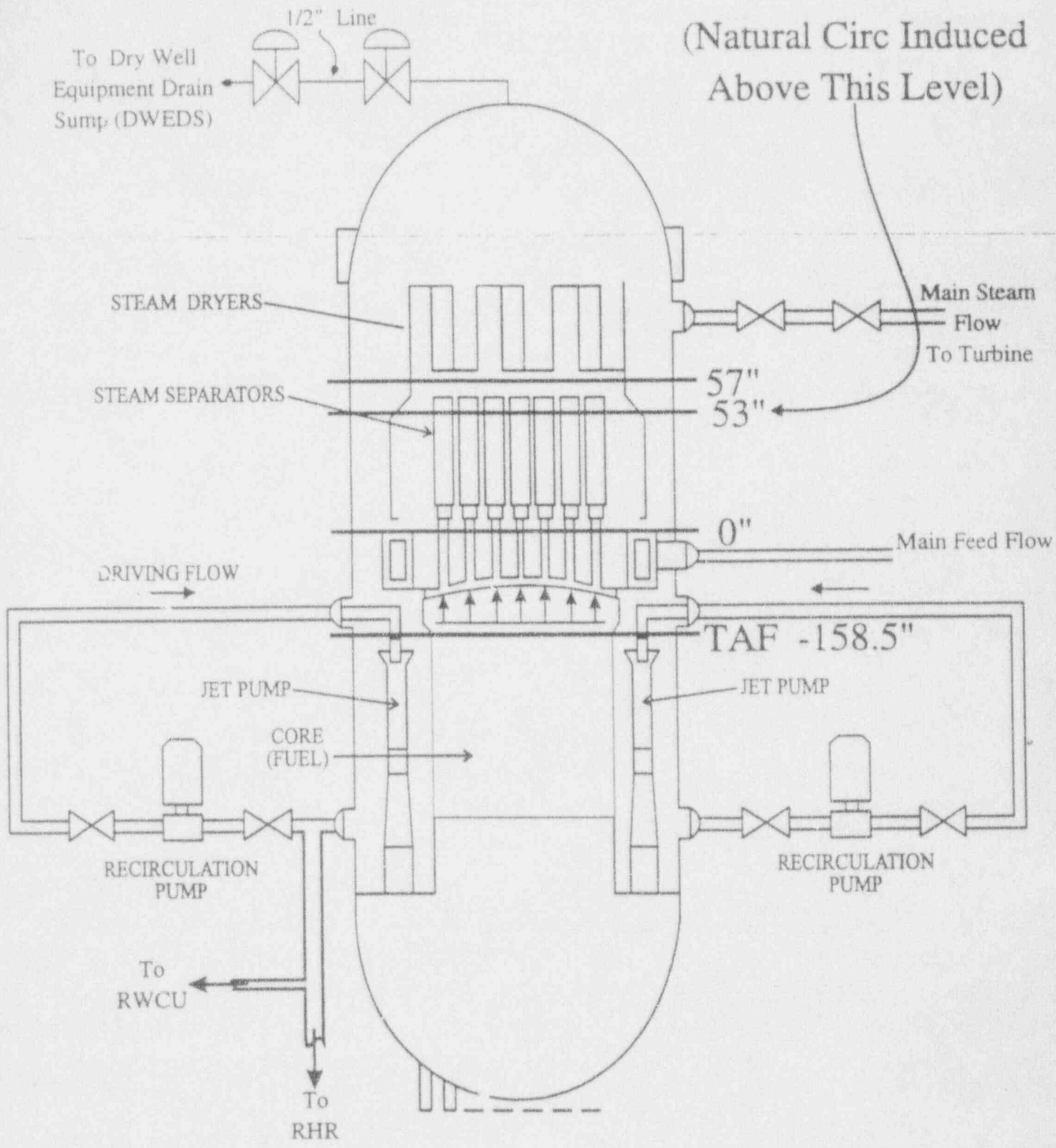
From the Inspection Report: "... the licensee did not demonstrate appropriate sensitivity...plans were to render the 'A' train of RHR inoperable only several hours after the time that this event occurred."

The planned removal of the 'A' loop of RHR was carefully considered in the Independent Outage Safety Assessment. The plan was based on extensive industry experience which showed that the loss of the common suction source is the most likely cause of loss of SDC events and that adequate core cooling capability was available from other sources.

IR 94-09 ISSUES

From Inspection Report: "...procedure does not inform operators that even with high reactor levels, the indicated temperatures may not be indicative of core area temperatures."

Monitoring temperature at the RWCU inlet historically is used for Technical Specification compliance. SIL 357 indicates that raising the reactor water level to the point that natural circulation is induced will provide adequate mixing in the downcomer region and will provide accurate temperature indication. Procedures addressed this guidance. However, this event showed that even with natural circulation indicated temperatures will lag the average temperature.



IR 94-09 ISSUES

From Inspection Report: "...procedure does not contain guidance on how the metal temperatures should be used."

SIL 357 indicates that vessel metal surface temperatures should be monitored for increasing trends. Operations procedures require monitoring of vessel metal temperatures. Operators monitored the temperatures as required, realized the significance of the increasing metal temperatures, and, consequently, expeditiously placed the 'A' loop in SDC.

IR 94-09 ISSUES

From Inspection Report: "The guidance did not ensure adequate monitoring for reactor pressurization."

SIL 357 indicates that monitoring pressure will provide confirmation of vessel pressurization within the limits of detectability in the low pressure range of the pressure indicator. This guidance was included in the procedures. The slight pressure increase was not noticed during the event due to the limits of detectability of the indicators being used. Pressurization at these levels is not a violation nor does it pose a safety concern. The approach to Hot Shutdown was noted in monitoring vessel metal temperatures.

IR 94-09 ISSUES

From Inspection Report: "Procedure ... stated that vessel pressurization could occur ... if the vessel is not vented."

Lessons learned are that pressurization with head vent valves open is possible. Even though the procedure implied that with the vent valves open pressurization was not possible, Operations personnel monitored reactor pressure indicators throughout the event in accordance with procedures.

IR 94-09 ISSUES

From Inspection Report: "The recommendations of the SIL included not removing the SDC/RHR system from service or restricting its performance unless the reactor cavity is flooded...."

The existing Operations procedure and outage management philosophy incorporate the SIL recommendation in this area. The intent of the SIL is to advise against removing ALL RHR loops from service before the cavity is flooded. By maintaining a loop of SDC in service, the SIL recommendation is satisfied. This has been confirmed by GE.

IR 94-09 ISSUES

From Inspection Report: "...graph is difficult to use as a reference."

The graph in the Operations procedure was usable. However, the graph has been enhanced in the procedure to make it more user friendly.

DOCUMENT TITLE:
LOSS OF SHUTDOWN COOLING

DOCUMENT NUMBER:
84AB-E11-301-28

REVISION NO:
3

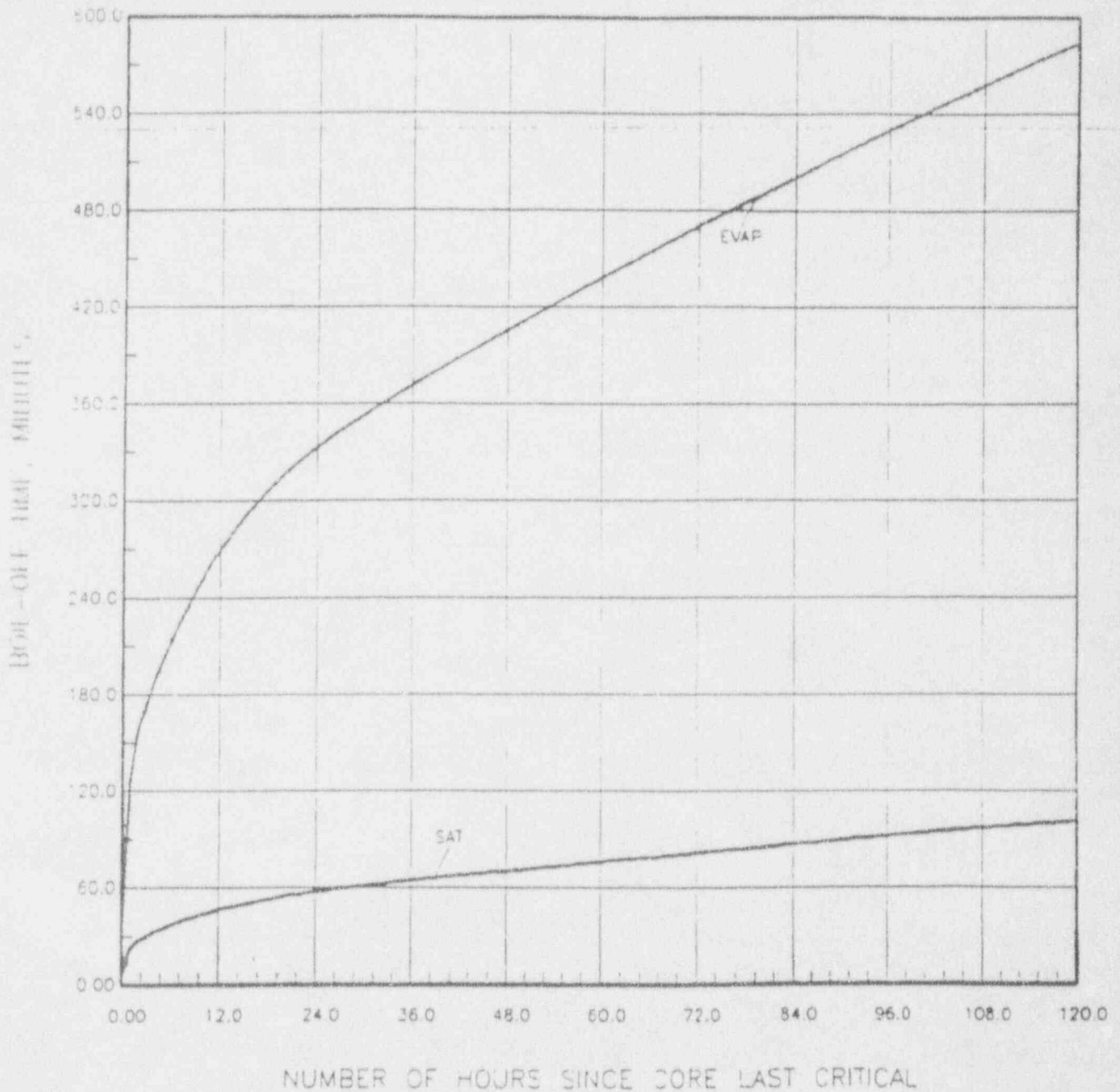
ATTACHMENT 1

PAGE

TITLE: VESSEL ONLY BOIL-OFF TIME

1 OF 2

OPTION 1, VESSEL ONLY BOIL-OFF TIME



NOTE: All fuel still in core; RPV Boil-off time with cavity gates installed AND normal RPV water level.
Saturation is the time to boiling for a complete loss of Shutdown Cooling.
Evaporation is the time for water level to evaporate to the top of the active fuel with a complete loss of Shutdown Cooling.

DOCUMENT TITLE:
LOSS OF SHUTDOWN COOLING

DOCUMENT NUMBER:
34AB-E11-001-2S

REVISION NO:
2

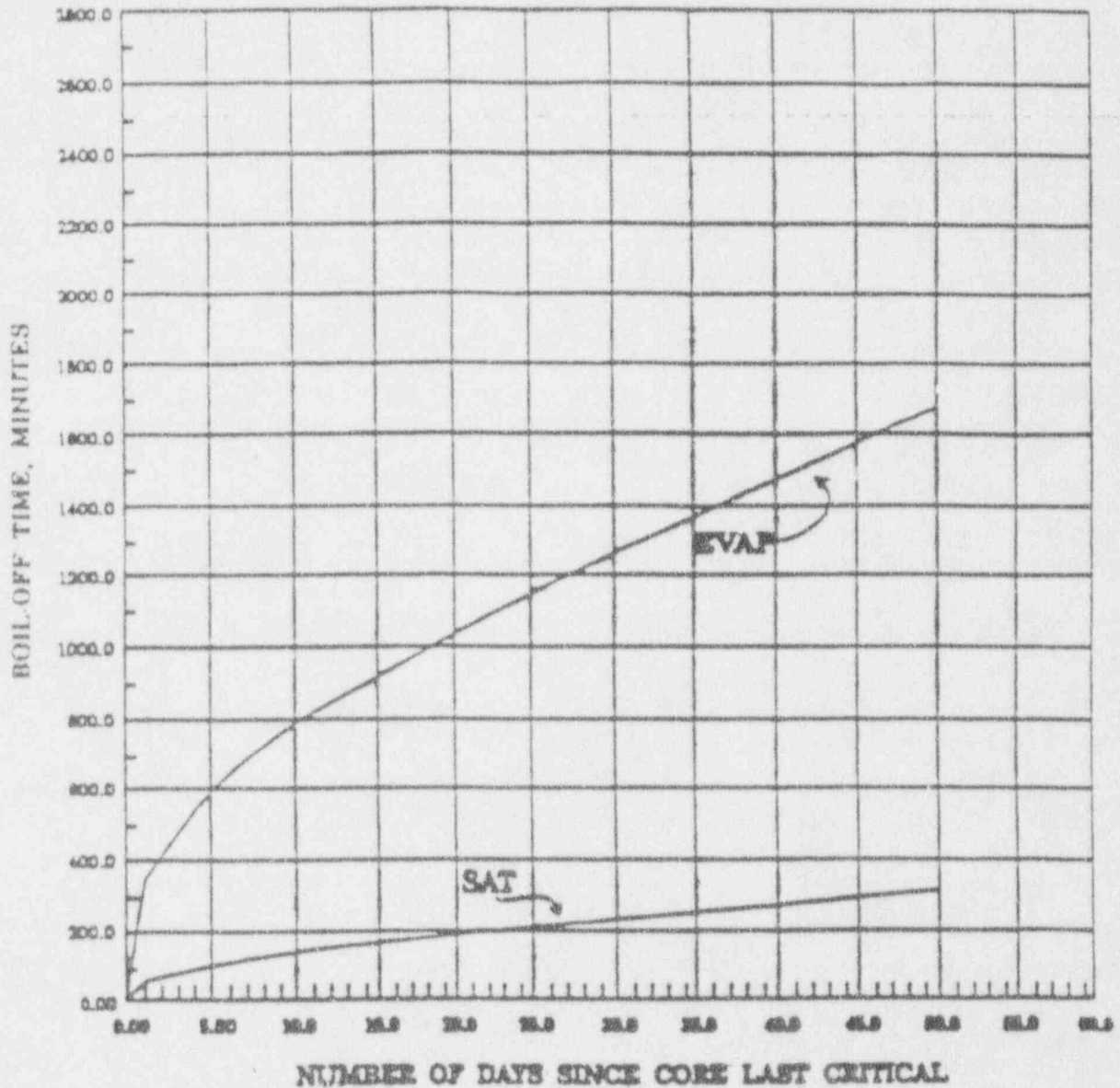
ATTACHMENT 1

PAGE

TITLE: VESSEL ONLY BOIL-OFF TIME

1 OF 1

OPTION 1. VESSEL ONLY BOIL-OFF TIME



NOTE: All fuel still in core; RPV Boil-off time with cavity gates installed AND normal RPV water level.
Saturation is the time to boiling for a complete loss of Shutdown Cooling.
Evaporation is the time for water level to evaporate to the top of the active fuel with a complete loss of Shutdown Cooling.

IR 94-09 ISSUES

From Inspection Report: "...the procedure was not revised appropriately since under high decay heat loads, checks should be made more frequently."

The frequency for performing cold shutdown checks had been changed from once per 4 hours to once per hour. Even though more frequent checks would not have resulted in earlier detection of SDC loss in this event, the frequency of the checks has been increased as a conservative measure.

SAFETY SIGNIFICANCE

This event resulted in no risk to the public safety and health based on the following:

1. Technical Specification Compliance:

	Compliance
Primary and Secondary Containment Required for Entry into Mode 3 (Mode 3 was not entered during this event.)	YES
Reactor Pressure Shall Not Exceed 1325 psig	YES
Reactor Water Level Shall Be Above The Top Of The Active Irradiated Fuel	YES
Required Core Spray and Low Pressure Coolant Injection Loops Must Be Operable	YES
Required Plant Service Water Pumps Must Be Operable	YES
At Least 1 Diesel Generator Must Be Operable	YES
At Least 1 Division Of DC Power Must Be Operable	YES

SAFETY SIGNIFICANCE

2. Adequate core cooling existed throughout the event.
3. Cold Shutdown of the reactor was maintained throughout the event.
4. "...the staff concludes that loss of RHR in BWR's during shutdown is not a significant safety issue..."
(NUREG-1449, page 6-7)
5. Shutdown risk vulnerabilities:
 - PWR - Loss of residual heat removal
 - BWR - Loss of coolant via draining

(W.T. Russell presentation to the Commission, 7/20/93)

SAFETY SIGNIFICANCE

6. **Secondary Containment (versus Primary Containment) offers significant public protection against loss of shutdown cooling events with the vessel intact.**

CORRECTIVE ACTIONS TAKEN

1. Revised outage management philosophy to require that both RHR loops be available until the reactor cavity is flooded.
2. Revised administrative controls requiring CSD checks at an increased frequency during shutdown cooling operation.
3. Informed all on-shift Operations personnel about the event via "Beginning of Shift Training."
4. Enhanced procedure regarding the use of the process computer for monitoring reactor pressure.

CORRECTIVE ACTIONS TAKEN

5. Enhanced procedure regarding coolant temperature measurement in the event of a loss of forced shutdown cooling.

CONCLUSIONS

1. GPC is sensitive to the need to maintain adequate core cooling during shutdown conditions.
2. Regulatory and Technical Specification requirements were met during this event. RHR was available throughout this event.
3. This event resulted in no risk to the public safety and health.
4. The activity in the control room panel which initiated this event was proper.

CONCLUSIONS

5. The actions of the control room operators met management expectations for prompt recovery of shutdown cooling.

6. Corrective actions taken following the Unit 1 event of April 1993 were fully adequate and were not expected to prevent future events involving an interruption of shutdown cooling flow.