Attachment 1

H. B. Robinson

Steam Generator Inspection Results

Agenda

I. Introduction

II. Summary of Results

III. Management Overview

IV. General Discussion

V. Summary and Conclusions

Introduction

Eddy Current Inspection Made in May, 1983 at H. B. Robinson at 6 effective full Power Months into Cycle 9.

Outage included Sludge Lancing and Crevice Flushing in addition to ECT inspection.

Preliminary results conveyed to the NRC Staff via telephone on May 12-13, 1983.

NRC approved 3 EFPM of operation on May 13, 1983 by telephone. This was confirmed in CP&L's letter of May 16, 1983.

CP&L's letter of July 8, 1983 provided the formal Steam Generator Eddy Current Inspection Report.

Summary of Results

Inspection Results:

100% of tubes were inspected.

363 tubes were plugged.

Breakdown by Steam Generator:

Steam Generator	Tubes Plugged
A	16
B	139
C	208
TOTAL	363

Corrossion Rate:

Steam Generator	# of Indications		Corrossion Rate (% degradation/EFPM)
A	HL	194	1.34
	CL	182	4.07
B	HL	232	1.59
	CL	472	2.82
C	HL	499	2.81
	CL	975	4.61

STRUCTURAL CALCULATIONS:

ACCIDENT CONDITIONS

STEAM LINE BREAK PLUS SSE LIMITING FOR H. B. ROBINSON

MAXIMUM ACCEPTABLE DEGRADATION - 70% OF WALL THICKNESS

NORMAL OPERATING CONDITIONS

1.5 INCH UNIFORM DEGRADATION IS LONG ENOUGH TO BE CONSIDERED INFINITE AND IS CONSERVATIVE

TYPICAL COLD LEG INDICATION AT HBR JUST ABOVE THE TUBE SHEET <1.5 INCH

MAXIMUM DIFFERENTIAL PRESSURE = 1660 PSI

ASSUMING A 68% THROUGH-WALL INDICATION WITH A 1.5 INCH AXIAL EXTENT, BURST PRESSURE = 3750 PSI

SAFETY FACTOR = 2.3

PRESENT PLUGGING CRITERIA IS 47% WALL LOSS

OPERATING INTERVALS (PROPOSED CRITERIA - 68% WALL LOSS)

S/G		CORROSSION RATE (%/EFPM)	CORROSSION MARGINS (%)	OPERATING INTERVALS
A	HL	1.34	21	15.67
	CL	4.07	21	5.61
B	HL	1.59	21	13.21
	CL	2.82	21	7.45
C	HL	2.81	21	7.47
	CL	4.61	21	4.55

JUSTIFICATION FOR CONTINUED OPERATION:

CALCULATIONS

1) SAFETY FACTOR >2 IS CONSERVATIVE.
2) ASSUMPTION OF 1.5 INCH INDICATION AND UNIFORM DEGRADATION ARE BOTH CONSERVATIVE.
3) CP&L COMMITTED TO A VERY RESTRICTIVE LEAKAGE CRITERIA THAT IS CONSERVATIVE WITH RESPECT TO THE NORMAL TECHNICAL SPECIFICATIONS.
4) ECT OVERPREDICTS THINNING. THIS OVERPREDICTION IS ALSO CONSERVATIVE.
5) SAFETY FACTOR WILL ONLY GO BELOW FACTOR OF 3 IN
   S/G A FOR 1.8 EFPM
   S/G B FOR .6 EFPM
   S/G C FOR 2.1 EFPM

OTHER CONSIDERATIONS

1) CHEMISTRY CONTROL EXTREMELY GOOD - VERY TIGHT SYSTEM NOW.
2) BORIC ACID BEING ADDED - GOOD RESULTS HISTORICALLY FROM S/G A.

Management Overview

The proposed operating interval of 4.5 months is conservative.

The proposed operating interval of 4.5 months is a one-time request.

The proposed operating interval allows CP&L the flexibility required to be able to operate until the end of Cycle 9 prior to the next S/G inspection. (The next operating interval would be based on that S/G Inspection)

The S/G Replacement was originally planned for 1/84. Protracted licensing proceedings will delay the replacement until around 5/84. The plant must be refueled to accomplish this and commitments planned for 1/84 must slide with the shift in the Replacement Outage. In order to reach 5/84 the unit must be refueled, preferably in late 1983.

The Steam Generators will be replaced during Cycle 10 when the licensing proceedings are completed.

FLEXIBLITY IS NEEDED IN THE OPERATING SCHEDULE IN ORDER TO:

1) ALLOW EARLY INSTALLATION OF THE VERY LOW FLUX CORE (PLSA DESIGN) FOR PTS CONCERNS.

2) ALLOW CP&L TO CONTINUE TO OPERATE THE UNIT TO THE BENEFIT OF THE PUBLIC DURING PROTRACTED STEAM GENERATOR REPLACEMENT PROCEEDINGS. AVOIDS THE UNIT SITTING IDLE WAITING FOR A LICENSE AMENDMENT.

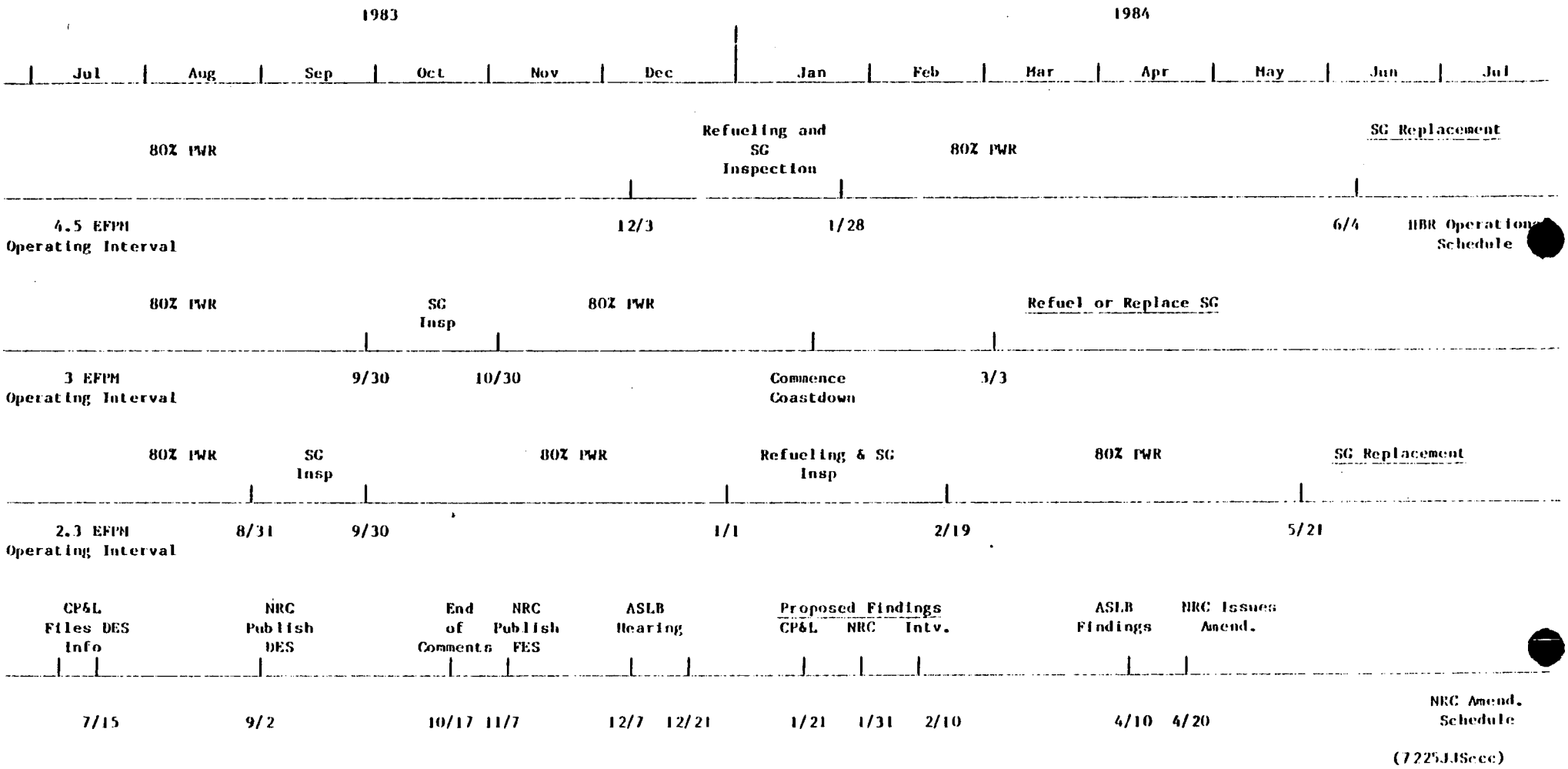
3) MINIMIZE RADIATION EXPOSURE DUE TO AN EXTRA OUTAGE AND STEAM GENERATOR INSPECTIONS.

4) MINIMIZES PLANT TRANSIENTS DUE TO STARTUP AND SHUTDOWNS.

5) ALLOW CP&L TO OPERATE THROUGH THE WINTER PEAK AT MAXIMUM POWER TO BENEFIT THE PUBLIC.

Schedule for H. B. Robinson

Steam Generator Repair Amendment



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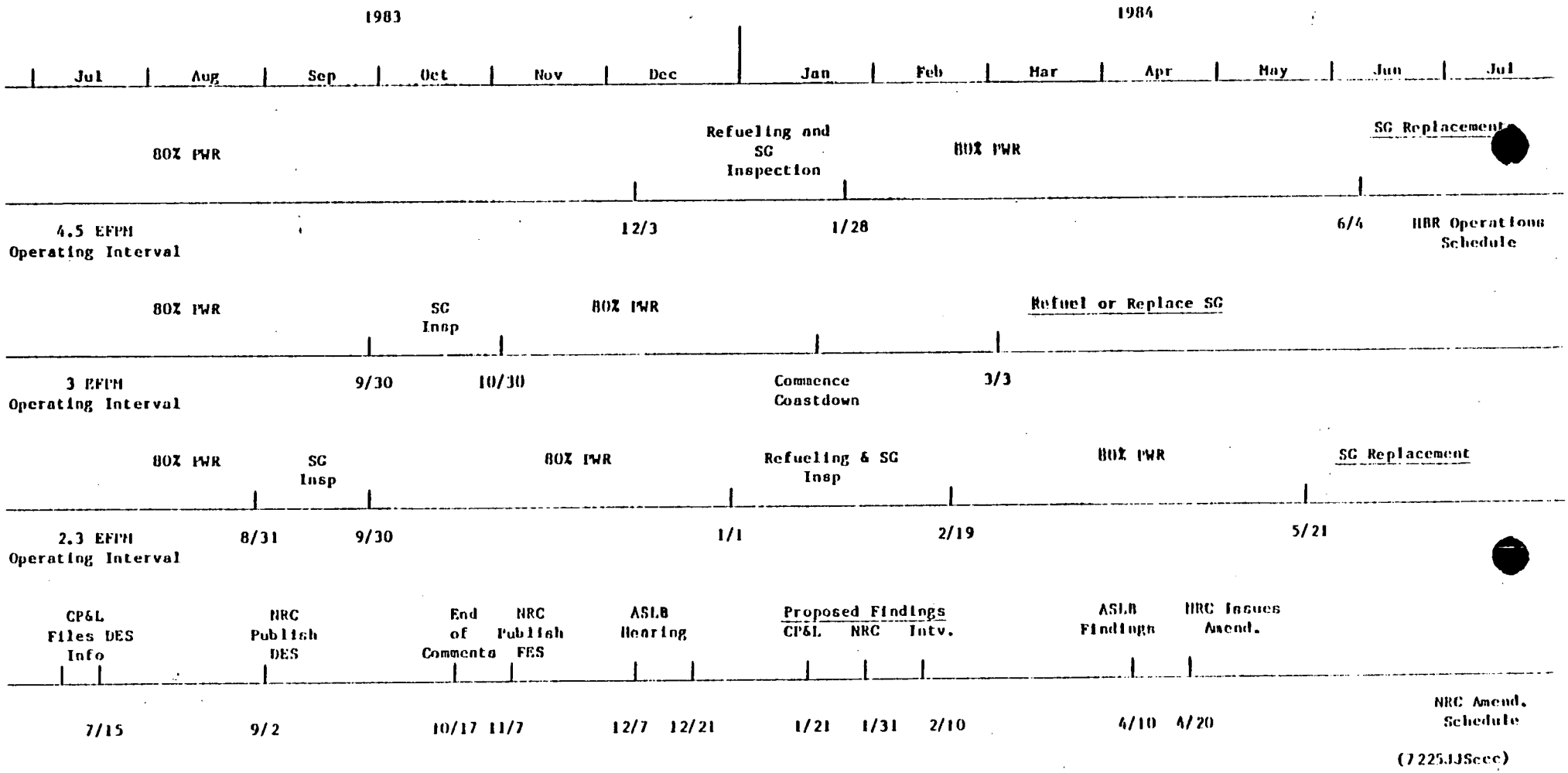
Schedule for H. B. Robinson

Steam Generator Repair Amendment



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QUALITATIVE COST BENEFIT:

BENEFITS TO CUSTOMERS/PUBLIC ARE ACHIEVED BY CONTINUED OPERATION, MINIMIZATION OF OUTAGES AND RADIATION EXPOSURE AND EARLY INSTALLTION OF THE VERY LOW FLUX CORE.

COSTS ARE SMALL - SMALL REDUCITON IN THE SAFETY FACTOR FOR LOW PROBABILITY EVENTS OVER A SHORT OPERATING TIME.

SUMMARY:

PROPOSED OPERATING INTERVAL IS CONSERVATIVE.

FLEXIBILITY PROVIDED BY THE PROPOSED OPERATING INTERVAL PROVIDES POSITIVE BENEFITS TO THE PUBLIC.

(7371JJSPGP)

H. B. ROBINSON STEAM ELECTRIC PLANT UNIT NO. 2
COMMITMENTS FOR REFUELING OUTAGE #10

Commitment Description	Source	Required Actions	Disposition	Comments
1. Install Reactor Vessel Level Instrumentation System (RVLIS).	CP&L Letter 04/26/83	Modification	See Comments	See Attachment 2A
2. Hydrogen Recombiner.	10CFR 50.44 (c)(3)(ii)	Modification	Install during Steam Generator Replacement Outage	See Attachment 2B
3. Reactor Coolant System (RCS) High Point Vents.	10CFR 50.44 (c)(3)(iii) CP&L Letter 10/01/82	Modification, Request for Additional Information and Procedure Change	Complete during Refueling Outage; Submittal of Information Request by February 1, 1984	See Attachment 2C
4. Install Refueling Water Storage Tank (RWST) Heaters.	CP&L Letter 12/7/82	Modification	Install during Steam Generator Replacement Outage	See Attachment 2D
5. Install sample lines from each HVH Motor Cooler to RMS to resolve potential unmonitored release path (Mod #604).	IER-81-31-03	Modification	Install during Steam Generator Replacement Outage	See Attachment 2E
6. Add low pressure alarm N2 backup to the low temperature overpressure protection system.	CP&L Letter 01/25/78	Modification	Install during Refueling Outage	
7. Provide a preventive maintenance procedure for PORV Block Valves.	LER-81-31-01	Procedure Change	Complete during Refueling Outage	
8. Provide MSLB information requested by NRC.	Amend. 71 to OL-07/23/82	Written Response	Will be submitted prior to refueling outage #10	

Commitment Description	Source	Required Actions	Disposition	Comments
9. Provide Preventive Maintenance Program for Safety-Related Instrument Buses Cleaning and termination tightening.	IER-82-27-10	Procedure Change	Complete during Refueling Outage	
10. Modify double disc gate valves SI-860A, SI-860B, and SI-865C. (SI-861B complete).	LER-82-11	Modification	Install during Steam Generator Replacement Outage	See Attachment 2F
11. Perform testing/verification of Reactor Coolant System Pressure Boundary threaded fasteners identified in IEB 82-02 and submit report within 60 days after testing.	IEB-82-02	Program Development and Written Response	Complete during Steam Generator Replacement Outage; Submittal 60 days after outage	See Attachment 2G
12. Revise surveillance procedures on RTGB pushbuttons.	IER-83-05-02	Procedure Change	Complete during Refueling Outage	
13. Provide study results and mods on overvoltage and undervoltage alarms to 115KV system.	CP&L Letter 03/23/83	Modification and Written Response to NRR	Complete during Refueling Outage; Submittal 60 days after startup	
14. Control of Heavy Loads - Implement plant operating and maintenance procedures which address the inspection, testing, and maintenance of special lifting equipment.	CP&L Letter 12/15/82	Procedure Change	Complete prior to Refueling Outage	
15. Modify pressurizer safety and relief valve piping supports.	CP&L Letter 12/28/82	Modification	Install during Steam Generator Replacement Outage	See Attachment 2H
16. Upgrade Emergency Operating Procedures and complete training.	CP&L Letter 04/15/83	Procedure Change and Training	Complete during Steam Generator Replacement Outage	See Attachment 2I

Attachment 2A

Reactor Vessel Level Instrumentation System (RVLIS)

In Carolina Power & Light Company's (CP&L) letter of April 26, 1983, we committed to install RVLIS during the first refueling outage, 90 days after NRC approval of the plant specific design and installation engineering. In addition, the plant specific installation design engineering and modification package preparation was committed to be complete by November 30, 1983. CP&L is still committed to these dates, and therefore, installation of the RVLIS will be conducted during the steam generator replacement outage contingent upon NRC approval of the plant specific design 90 days prior to commencement of the outage. Installation, calibration and testing could not be completed within the short refueling outage scheduled for the end of 1983.

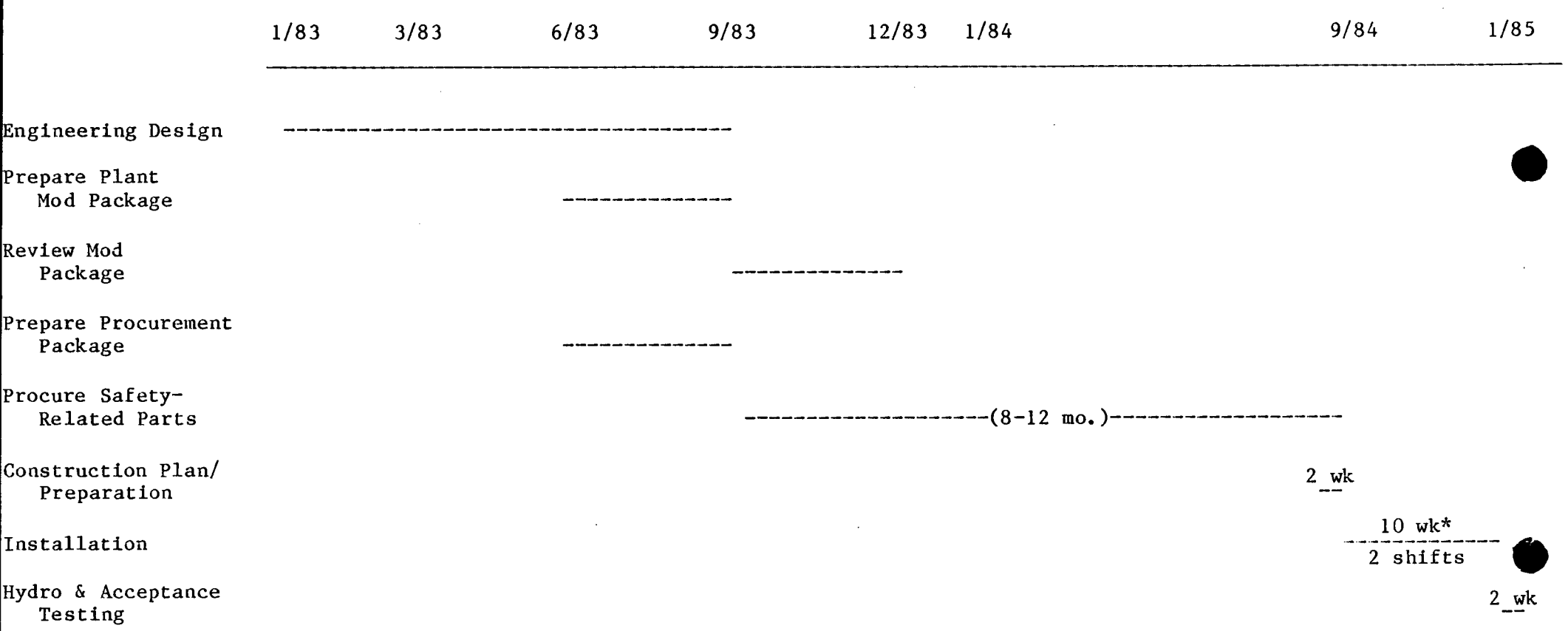
Attachment 2B

Hydrogen Recombiner

According to 10CFR 50.44(c)(3)(ii), "By the end of the first scheduled outage beginning after July 5, 1982 and of sufficient duration to permit required modifications, each light water nuclear power reactor that relies upon a purge/repressurization system as the primary means for controlling combustible gases following a LOCA shall be provided with either an internal recombiner or the capability to install an external recombiner following the start of an accident." As discussed at the July 15 meeting, the refueling will be a minimum length outage designed only to refuel the reactor and inspect the steam generator tubes (eight weeks). The modifications required to have the capability to install an external recombiner at HBR2 cannot be completed in that length of time (see Figure 1). Therefore, this modification will be completed during the steam generator replacement outage (as originally planned). It should be noted that the plant is currently equipped with a post-accident hydrogen purge system for controlling combustible gases following a LOCA. This system will remain operable pending completion of the hydrogen recombiner modification.

Figure 1

H_2 Recombiner Capability Modification Schedule



*Note: Cycle 10 Refueling Outage only scheduled for 8 weeks (7 weeks in which to do work)

Attachment 2C

Reactor Coolant System (RCS) High Point Vents

The RCS High Point Vents were originally installed in the 1980 refueling outage. It was determined at that time that the system was not functioning properly and was therefore not declared operational. Carolina Power & Light Company was in the process of reviewing the system to correct the problems when a new rule (10 CFR 50.44(c)(iii)) was issued that stated "by the end of the first scheduled outage beginning after July 1, 1982 and of sufficient duration to permit required modifications, each light-water nuclear power reactor shall be provided with high point vents for the RCS." The steam generator replacement outage was the next scheduled outage of sufficient duration beginning after July 1, 1982 as required by 10 CFR 50.44. The RCS High Point Vent modification will be completed during the refueling outage. The system, however, will not be declared operable pending the completion of NRC Staff review of the system design and the implementation of the upgraded Emergency Operating Procedures (EOPs). Upon completion of the Staff design review and implementation of the EOPs (see Attachment 2I), the system will be placed into operation. CP&L believes that this is consistent both with the requirements of 10 CFR 50.44 and NUREG 0737 Item II.B.1.

In addition, CP&L had received a request for additional information concerning installation and usage of the RCS high point vents in a letter from NRC dated March 18, 1982. In a letter dated October 1, 1982, CP&L committed to provide a response to the request for additional information approximately six months prior to the end of the outage during which the system will be installed. The system was then scheduled to be completed during the steam generator replacement outage in 1984. The present plan developed in mid-July, 1983 is for a new refueling outage beginning in November/December, 1983. As discussed at the July 15, 1983 meeting, this outage will be a minimum length (eight weeks) outage designed to refuel the reactor and inspect the steam generator tubes. Carolina Power & Light Company is working on a response to the request for additional information which is currently scheduled to be completed by February 1, 1984. There is not sufficient time to complete and submit the response six months prior to the end of the new outage.

Attachment 2D

Refueling Water Storage Tank Heaters

In its letter of December 7, 1982, Carolina Power & Light Company committed to the heating of the Refueling Water Storage Tank (RWST) during the next refueling outage, which at that time was the Steam Generator Replacement Outage scheduled for January, 1984. That outage has now been delayed by a few months and the commitment must slip with it.

The heating of the RWST is a commitment in response to the Pressurized Thermal Shock (PTS) issue. The NRC Staff has determined that the risk associated with PTS is acceptable without any actions by licensees as long as reactor vessel welds do not exceed the proposed PTS Screening Criteria. The H. B. Robinson reactor vessel will not approach the screening criteria until approximately 1993 with the present core design. Additionally, CP&L will install during the Cycle 10 refueling the PLSA core design which is expected to assure that the reactor vessel will not exceed the screening criteria prior to the expiration of the Operating License (2007). Therefore, the earliest that the modification could be required is 1993 and the delay of installation from January, 1984 to approximately June, 1984 has no safety significance.

Attachment 2E

HVH Motor Cooler

Carolina Power & Light Company (CP&L) has committed to install sample lines from each HVH motor cooler discharge line to a radiation monitor during the upcoming refueling outage. CP&L is unable to obtain the parts to complete this modification during 1983. However, in the interim, until the HVH modification can be completed, the daily routine leak inspections are considered adequate to safeguard against an unmonitored release. These inspections will continue until completion of the modification during the steam generator replacement outage. Therefore, continued operation until the steam generator replacement outage will have no impact on public health and safety.

Attachment 2F

LER-82-11

Carolina Power & Light Company committed to modify several double disc gate valves in LER-82-11 during the upcoming refueling outage. Carolina Power & Light Company has been unable to obtain the parts to complete this modification during 1983. However, the valves are presently administratively controlled, and will continue to be until modified during the steam generator replacement outage. Therefore, continued operation until the Steam Generator replacement outage will have no impact on public health and safety.

Attachment 2G

IE Bulletin 82-02

IE Bulletin 82-02 requires the implementation of new inspection requirements for all threaded fasteners on reactor coolant pressure boundary piping, 6-inches or greater. These inspection requirements (ASME XI IWA 2210, IWA 2220) are to be implemented whenever a threaded fastener is removed for maintenance. In order to adequately implement these requirements, a program will be developed to ensure that whenever a threaded fastener is removed for maintenance it is logged, inspected, and the results are documented. This information will then be used to generate the required 60-day report. Work has begun on developing the required program; however, there is not sufficient time between now and the proposed refueling outage to complete development of this extensive program. CP&L will therefore implement the inspection program during the steam generator replacement outage. We believe this schedule to be adequate based on relatively infrequent examples of degraded fasteners observed at HBR2 during the past thirteen years of operation. It should also be noted that very little reactor coolant pressure boundary work will be performed during the refueling outage and therefore very few inspections would be made even if the requirements of the Bulletin were implemented.

Attachment 2H

Pressurizer Safety and Relief Valve Piping Supports

By letter dated December 28, 1982, Carolina Power & Light Company (CP&L) submitted the Pressurizer Safety and Relief Line Evaluation Summary Report. It was stated that further evaluations were being conducted to determine support adequacy, and that any support modifications determined to be necessary would be accomplished during the next refueling outage. It has been determined that modifications to sections of the line downstream of the valves will be required for several supports. However, CP&L is unable to obtain parts in sufficient time to complete these modifications in 1983. Therefore, the support modifications are scheduled to be completed during the steam generator replacement outage. In the interim, since the failure of this line does not affect the operability of either the safety valves or the power operated relief valves, continued operation will not impact on the public health and safety.

Attachment 2I

Emergency Operating Procedures

In our response to GL 82-33 dated April 15, 1983, we described our schedule for implementation of the upgraded Emergency Operating Procedures (EOP). This schedule was based on a combined refueling/steam generator replacement outage so that there would be sufficient time to implement the procedures and fully train the operations staff. This training is expected to take a minimum of two weeks per operator with the entire staff completing the training in twelve weeks. Based on this training workload, it will be impractical to train all of the operators and conduct a refueling outage simultaneously. In addition, issuance of the Westinghouse Owners Group final Rev. 1 technical guidelines has been delayed until late August, with the background documents which are necessary to develop the training packages, not expected until December 1983. These delays and a November/December refueling make it necessary to schedule implementation of the EOPs during the steam generator replacement outage. In the interim, existing Emergency Instructions will continue to provide adequate guidance to operations personnel during transients.