

Files

July 23, 1965

THRU: Saul Levine, Chief, Test & Power Reactor
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MEETING ON PEACH BOTTOM

50-171

A meeting was held at the DRL offices on July 20, 1965, with representatives of the Peach Bottom project to (1) review the pre-operation test program, (2) identify and discuss those systems and components that may not be operable prior to issuance of the 1 Mw operating license and initial fuel loading, and (3) identify and discuss changes that have been made to the plant since the publication of our safety analysis.

Personnel attending the meeting were:

<u>Project Representatives:</u>	J. L. Everett	Philadelphia Electric Co.
	E. J. Bradley	Philadelphia Electric Co.
	V. S. Boyer	Philadelphia Electric Co.
	J. S. Kemper	Philadelphia Electric Co.
	J. L. Allen	Philadelphia Electric Co.
	Howard Friend	Bechtel Corporation
	H. E. Hoffman	General Atomics
	T. R. Moffette	General Atomics
	J. R. Brown	General Atomics

<u>AEC:</u>	Saul Levine	DRL (part time)
	R. E. Ireland	DRL
	K. R. Goller	DRL
	J. E. McEwen, Jr.	DRL
	J. R. Sears	DOC
	W. Hepburn	DRD&T

The current estimated date for the start of initial fuel loading is September 15, 1965.

Unresolved problems of possible significance which currently exist in the plant are:

1. Water and oil have been detected in some of the primary system auxiliary piping. This will be cleaned out, the source determined and appropriate modifications made to prevent a recurrence.
2. Main helium blower rotating and static seals are leaking excessively.

~~This will be corrected by blower vendor, Clark Bros.~~

OFFICE ▶					
SURNAME ▶					
DATE ▶					

A-437

July 23, 1965

3. Inner vessel of the liquid nitrogen Kr-85 trap has a leak. This will be repaired, but since repair will be difficult it may be postponed until after fuel loading.
4. Three of the four isolation valves in the primary system do not attain a leak-tight closure when the system is pressurized on both sides of the valve seat. The valve manufacturer, Chapman Valves, will attempt to correct this by modifying the high pressure helium gas system that is supposed to activate the valves split-gates to provide a leak-tight seal.
5. The spent fuel canning machine is not providing a satisfactory leak-tight weld. Modifications to correct this are expected to be minor.
6. The steam generator lateral support dashpots are leaking oil. A fix, (possibly use of a more viscous oil) will have to be attained before the steam generator vaults can be sealed.
7. Construction work has not yet permitted sealing the primary system shielding compartments and therefore, the leakage rates of these compartments and the effectiveness of the ventilation system in maintaining slight negative differential pressures in these compartments has not been demonstrated. Preliminary tests indicate that it may not be possible to attain negative differential pressure values quite as high as those specified in the FHSR.
8. The plastic coating on the spent fuel pit had deteriorated and developed leaks; the coating has been replaced and a leakage test is currently in process.

Philadelphia Electric Company representatives indicated that the only pre-operational tests included in their previous submittal which may not be completed before the start of initial fuel loading are the following:

1. No. 10-F Spent Fuel Canning Machine, (see Item 5 above)
2. No. 1-K Acoustical Thermometers, (cannot be tested until significantly high core temperatures are attained)
3. No. 4-A Reflector Seal Leakage, (this test may be deleted entirely because available instrument accuracy may make test impractical)
4. No. 8-B Liquid Nitrogen Traps, (see Item 3 above)

5. No. 20-C Containment Ventilation, (see Items 6 & 7 above)

OFFICE ▶					
SURNAME ▶					
DATE ▶					

July 23, 1965

After discussion of what these tests included and the importance of the equipment and systems involved to 1 Mw operation, it was concluded by all parties present that fuel could be loaded and the reactor operated up to 1 Mw without these tests having been completed.

Philadelphia Electric Company representatives stated that all pre-operation tests or portions of tests which had been completed prior to the fire, the results of which could have been affected by the fire, have been or will be re-run.

Philadelphia Electric Company representatives distributed copies of the attached draft of "Miscellaneous Errors in the Peach Bottom FHSR". Revised pages will ultimately be submitted to update the FHSR. Also included in this listing are the changes in the plant which have not previously been reported in one of the semi-annual progress reports. These changes will be included in the next semi-annual report to be issued about August 23.

Particularly significant changes which should be noted are:

1. All the wire and cables which had been damaged by the fire on February 3, 1965 have been replaced. In so doing, improved fire resistant cables were used and minor changes were made in the design of containment electrical penetrations. Fire stops were installed in vertical cable runs and lids were installed on certain horizontal cable trays. An automatically activated CO₂ fire protection system has been provided for various electrical components and cables.
2. The larger diameter cables used in replacing that damaged by the fire required utilizing the spare containment building electrical penetrations. Six additional U-tube type electrical penetrations have been installed in the containment building to replace these spares. These new penetrations were radiographed but have not yet been integrity or leakage tested, which will be done during the next integrated leakage test of the entire containment building.
3. Modifications have been made to the control rod scram circuitry to permit manually resetting (closing) the scram valve to permit reestablishing header pressure after a hydraulic system low pressure signal has caused a scram.
4. Modifications have been made to the loop isolation circuitry to permit at power testing of the multipurpose amplifiers as part of the routine safety system testing.

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DATE ▶						

July 23, 1965

A significant item which is mentioned in the attached draft list of design changes, but which will not be included in the semi-annual report, is that consideration is being given to a program involving installation of a small number of experimental fuel irradiation specimens in the initial Peach Bottom fuel loading. After having reviewed this program in detail themselves and arriving at a positive decision, Philadelphia Electric plans, after issuance of the operating license, to request a Technical Specification change to permit installation of the samples before completing initial fuel loading and physics tests.

In order to clear an item held over from our review, we asked whether the post-accident containment atmosphere recirculation and filtering system fan motors are sized to operate at accident pressure and temperature; both Messrs. Kemper (PE) and Friend (Bechtel) answered with a definite "yes".

Attachment:

Draft, "Miscellaneous Errors in the
Peach Bottom FHSR"

bcc: E. G. Case, DRL
Suppl.
DRL Reading
T&PRSB Reading
K. R. Goller, DRL

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MISCELLANEOUS ERRORS IN FHSR

General

1. Revise Forward to reflect all volumes (no longer just five).
2. Revise Table of Contents to include all volumes. Revise Roman numeral IV to add "Annex F."

Volume II - Plant Description and Safeguards Analysis

- II-13, line 36: Change (1400°C) to (1100°C).
- II-23, line 5: Change "sepctrum" to "spectrum."
- *II-29, line 22: Delete "one rod at a time."
- II-34, line 28: Change "vaying" to "varying."
- II-58, last line: Change "Table II-34" to "Table II-24."
- II-63, line 14: Change "gap width increase from 0.0045 inch to 0.008 inch" to "0.0045 to 0.007 inch" as shown in Figure II-2 and -3 submitted June, 1964.
- II-71, second line of paragraph "a": Change "vale" to "valve."
- II-75, line 1: Change "axail" to "axial."
- II-95, next to last line: Capitalize "the."
- II-175, line 12: Replace "air room" by "nitrogen space."
- II-222, 1st line: Change Section II.H.2 to Section III.H.2.
- II-223, 1st line: Change "35%" to "15%".
- *II-234, lines 24, 25, 26, 27: Change to read: The rod withdraw permissive for source range low count rate is automatically transferred to the intermediate range channels when the shield is lowered.
- II-237, line 15: Change "0 to 150%" to "1 to 150%".
- II-249, next to last line: Change "safequards" to "safeguards."
- II-276, line 31: Delete "after the coolers."

Volume III - Plant Description and Safeguards Analysis

V-21, Section b: Delete "Manager - Nuclear Power" and insert "General Superintendent."

V-32, e.1 disagrees with II-264 and should be revised to read: "at approximately 1×10^{-4} rated power (corresponding to 6×10^4 cps).

Change e.3 to read "A high intermediate range flux scram."

Change 3.4 to read: "A high neutron flux (power range) scram is set at 5% power."

V-33, 4.1 Replace 9×10^4 cps with 6×10^4 .

4.2 Replace "A high rate of increase scram" with "A high rate of flux change scram at 2 DPM."

V-34, 4.3 Change to read consistent with II-263, "A high neutron flux (intermediate range) scram at 0.01% power.

4.4 Change to read: "A high neutron flux (power range) scram is set at 5% power."

4.6 A high neutron flux (intermediate range) scram is set at 1.4% power during tests in the range between 11.5 kw(t) and 1.0 Mw(t)."

V-37, subparagraph 1, 2nd line: Replace "19%" by "10%".

V-45, line 19: Change "preapred" to "prepared."

VII-1, 32nd line: Replace "0.6 millirem" by "1.3 millirem."

VII-23, 21st line: Insert "cooling" after "continued."

* #VII-29, 9th line: I-133 Activity in Containment Building - At 7 Days--
Replace "2.67 Megacuries" by " 2×10^{-2} Megacuries."

* #VII-55, 8th and 9th lines: Replace "whole body gamma 0.0006 rem, thyroid 0.2 rem, and bone 0.002 rem" by "whole body gamma 0.0013 rem, thyroid 0.2 rem, and bone 0.0028 rem."

* #Errors of possible significance.

DESIGN CHANGES SINCE FHSR AND NOT LISTED IN SEMIANNUAL REPORTS

General

- * [1. General Atomic does not believe the FHSR report should be revised to include information about the experimental fuel irradiation specimens which are inserted, moved, or removed from the reactor during various experiments. *8 elements*]
2. Should any section of the FHSR be revised to show the use of the pulse and steady state neutron sources in the core? the fission counters? Also regular source locations.
3. The revised CCC Drawings (S7N12 and S9N05) should be submitted (a previous set of drawings was submitted with the supplement). (Drawings available.)

Volume II- Plant Description and Safeguards Analysis

- II-98, 6th line: Add to end of paragraph "An exception is a hydraulic system HP header scram signal caused by low pressure can be manually reset closing the scram valve to permit reestablishing header pressure. Reset can only occur after the main scram breakers have tripped."
- II-115, Add to the first complete paragraph, "However recovery from a scram will require operator action to RESET the loss of hydraulic rod pressure logic."
- II-174, after line 32, add a new paragraph explaining the revisions to the static seal control system which enhance the plant safety.
- "The reliability of the static seal system has been increased by providing local control stations, accessible in the air room, for engaging the main compressor seals to prevent loss of coolant in the event of failure of the normal control valve. A bottle supply has also been provided for actuating of the static seal control valves even if the normal instrument air supply is not available."
- II-189, line 12: Add at end of the paragraph, "The reactor outlet and compressor outlet valves are closed using completely redundant electrical and pneumatic controls. A backup instrument nitrogen supply is provided at each local panel for use in the event of loss of normal instrument air. Manual air switches are provided to enable each valve to be operated in the event of complete loss of electrical power supply."
- II-190, lines 13 and 14: Replace "and sealing surfaces are either chrome plated or" by "are nitrided stainless steel. The seating surfaces are."
- II-225, line 7: Change to read "and are connected to the header through locked open valves to prevent accidental shutoff."

II-264 (dated June, 1964), 4th line: Add "(Note 8)" after "pressure."

II-264a (dated June, 1964), after Note 7: Insert "Note 8: Manually reset to close the scram valves to permit reestablishing HP header pressure. Reset can be utilized only after main scram breakers have tripped."

II-269, add to end of last paragraph: "During normal operation at power the built-in test features will permit demonstration of the proper operation of each of the output (multipurpose) amplifiers in the loop isolation circuitry."

Volume III - Plant Description and Safeguards Analysis

III-9, 1st paragraph: Change lines 2 and 3 to read: "An automatically activated carbon dioxide fire protection system is provided for various electrical components and cables, purified helium compressors, lube oil ... etc."

III-10, Table III-1, Change the value opposite Reactor Cavity and both steam generator cavities from -1" wg. to -1/2" to -1" wg.

? may want to change

Change the value opposite Helium Purification System Area, etc., from -1" wg. to -1/2" to -1" wg.

Change the value opposite Sub-File Room from -1-1/2" wg. to -1/2" wg. to -1-1/2" wg.

IV-4, Section 5.b: U-tube penetrations are used to seal multi-conductor and single conductor 600-volt cables plus multi-conductor thermocouple cables.

Multi-conductor 600-volt cable is so constructed as to prevent leakage through the interstices of the cable. Samples from each reel of cable were leak tested by the manufacturer. Sealing around the cables is accomplished by pouring in layers of grout, Chico (a water mixed electrical sealing compound which hardens into a dense mass expanding slightly on setting) epoxy and No-void or Farboil which are asphalt base non-hardening insulating compounds and soften at elevated temperature. Test voids are provided above the grout on the outside end of each U-tube.

Single conductor 600-volt cable is installed with gas stops by one of the following methods: (1) two Scotch-cast type splices, one each placed inside and outside the penetration, (2) a single heat-shrinking "Raychem" sealing sleeve shrunk over a solid barrier connector all buried in the layers of Chico, epoxy and No-void.

Multi-conductor thermocouple cable is first prepared for sealing by removing the outer jacket and spreading the individual wires where the cable enters the penetration.

The multi-conductor sealing is similar to that described above except that the grout is replaced by epoxy and a test void is provided on both sides of the U-tube.

A layer of fire proofing material (Vermiculite or equal) is placed on top of the No-void in each U-tube penetration.

Volume IV - Plant Description and Safeguards Analysis (Figures)

FIG. IV-1 Revise to show that E-23 and E-26 shown as capped spares will be used for power and control per fifth S.R.

Revise to show new penetrations resulting from fire.

FIG. IV-2 Revise to show changes in penetration designs resulting from fire modifications.