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Docket No. 50-289

Mr. Henry D. Hukill, Vice President
and Director - TMI-1
GPU Nuclear Corporation
P. O. Box 480
Middletown, Pennsylvania 17057

Dear Mr. Hukill:

SUBJECT: PRESSURIZED THERMAL SHOCK REFERENCE TEMPERATURE FOR BABCOCK
AND WILCOX REACTOR VESSELS

A meeting was held at NRC Headquarters on July 14, 1988 (meeting minutes attached) with the NRC staff, the Sacramento Municipal Utility District (SMUD), and Babcock and Wilcox (B&W) to discuss the pressurized thermal shock reference temperature (RTpts) for the Rancho Seco reactor. The meeting followed staff review of a letter dated June 16, 1988 in which SMUD responded to staff concerns regarding RTpts for WF-70 weld material. WF-70 weld material is used in the Rancho Seco reactor vessel and other reactor vessels manufactured by B&W, including the TMI-1 reactor vessel.

At issue was the appropriate value of the initial RTpts for unirradiated WF-70 material. The Code of Federal Regulations, 10 CFR 50.61, specifies that if a measured initial reference temperature is not available then a generic mean value of 0 degrees F must be used for the subject material and the margin to account for uncertainties is increased accordingly. The Rancho Seco Updated Safety Analysis Report assumes 0 degrees F as the initial RTpts. The initial RTpts is used along with accumulated neutron fluence and the uncertainty margin to compute RTpts during the operating life of the reactor vessel.

Recent publications by Babcock and Wilcox (BAW-1975 and BAW-1920P) identify possible values for the initial RTpts of WF-70. Although the RTpts measurements conducted to date may not meet the ASME Code Criteria for measuring initial RTpts, the test results appear to indicate that the initial RTpts of unirradiated WF-70 may be considerably greater than 0 degrees F. Hence, it may not be conservative to use 0 degrees F as the initial RTpts for WF-70. Based on available data, it does not appear that the Rancho Seco reactor vessel has reached the screening criteria as defined by 10 CFR 50.61. However, the test results raise concerns that the screening criteria may be reached sometime in the near future.

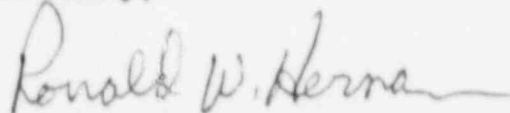
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A second meeting was held between members of the B&W Owners Group and the NRC staff on August 24 to further pursue this issue on a generic basis. During this meeting the Owners Group outlined a WF-70 evaluation program with NRC updates over the next 18-month period (see Enclosure 1). An evaluation, using three different methods, was presented showing margin to the PTS screening criteria for each plant containing WF-70 weld material (see Enclosure 2). This evaluation shows TMI-1 as not reaching the screening criteria during the life of the plant if the value of 0 degrees F is used and is valid. Should the Owners Group evaluation indicate that a higher initial value of RTpts is appropriate, the screening criteria could be reached during the lifetime of the plant, conceivably in the next several years.

The purpose of this letter is to notify GPU Nuclear of this issue in that it could impact operation of TMI-1 at some future date and to request that you inform the NRC staff of any TMI-1 plant-specific information regarding WF-70 weld material that may impact compliance with 10 CFR 50.61 or continued plant operation.

Sincerely,



Ronald W. Hernan, Senior Project Manager
Project Directorate I-4
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Enclosures:
As stated

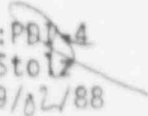
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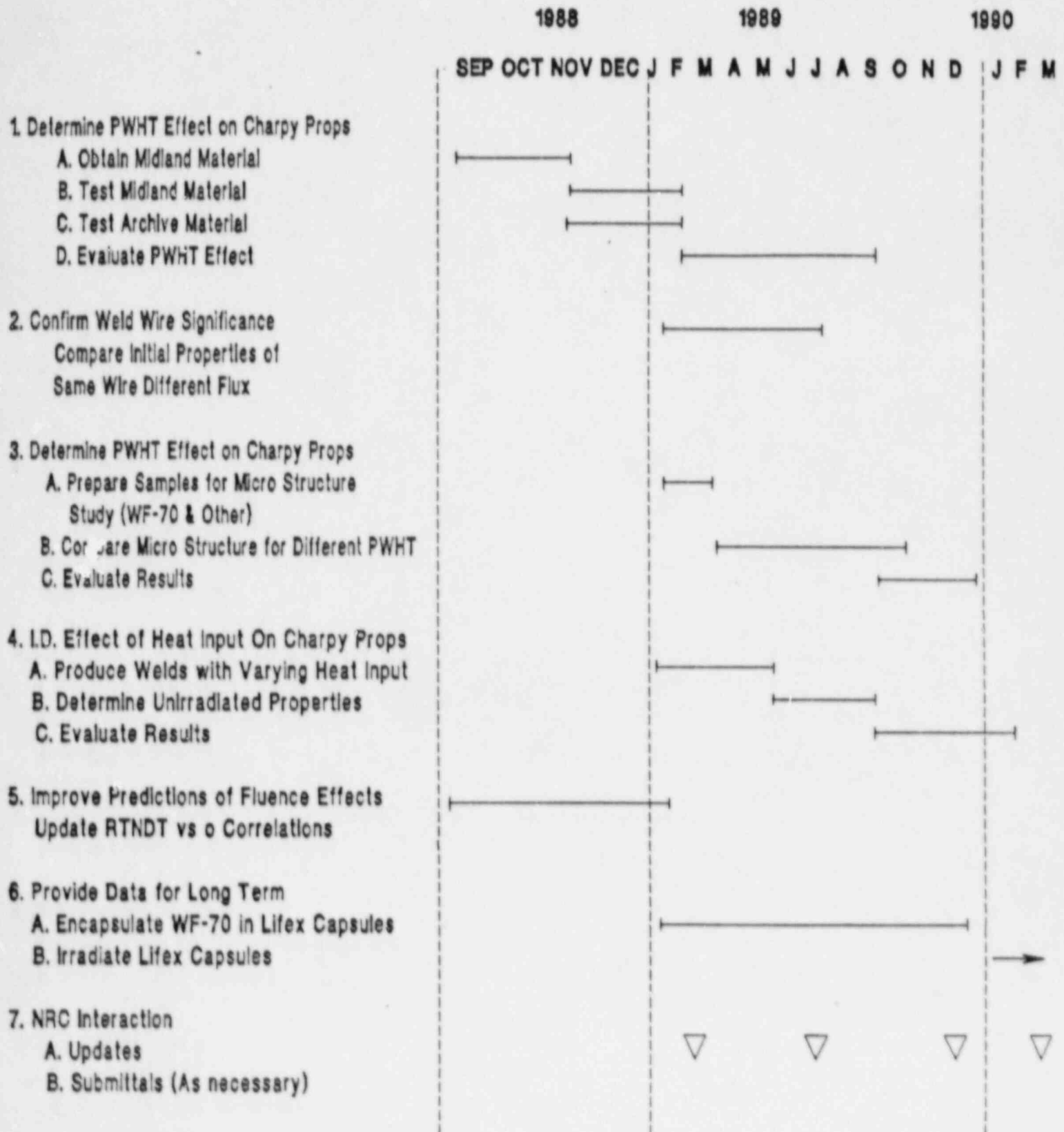


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B&WOG WF-70 EVALUATION PROGRAM

SCHEDULE



Evaluation of Various Initial RT_{NDT}
and Shift Models on Meeting PTS Screening Criteria

Plant	Weld Location	Est. Fluence 32 EFPY	Initial Value RT _{NDT} , F			RT _{NDT} Shifted (EOL), F			Margin F	32 EFPY RT _{NDT} , F	Screening Criteria	Screening Criteria Met	
			RT _{pts}	RG	1.99/2 1803/1	RT _{pts}	RG	1.99/2 1803/1				EFPY	Cal. Yr.
TMI-1	Upper circumferential (100%)	5.98E+18	0	-	-	197	-	-	59	256	300	>32	-
		"	-	+24	-	-	181	-	76	281	300	>32	-
		"	-	-	-1	-	-	137	61	197	300	>32	-
CR-3	Middle circumferential (100%)	1.06E+19	0	-	-	230	-	-	59	289	300	>32	-
		"	-	+24	-	-	214	-	76	314	300	~25	2013
		"	-	-	-1	-	-	175	61	235	300	>32	-
RS	Lower longitudinal (I.D. 73%)	8.8E+18	0	-	-	219	-	-	59	278	270	~27	2014
		"	-	+24	-	-	203	-	76	303	270	~18	2003
		"	-	-	-1	-	-	163	61	226	270	>32	-
Zion 1	Middle circumferential (100%)	1.7E+19	0	-	-	262	-	-	59	321	300	~24	2007
		"	-	+24	-	-	242	-	76	342	300	~16	1997
		"	-	-	-1	-	-	206	61	266	300	>32	-
Zion 2	Upper longitudinal (100%)	7.9E+18	0	-	-	213	-	-	59	272	270	~31	2015
		"	-	+24	-	-	197	-	76	297	270	~21	2003
		"	-	-	-1	-	-	156	61	216	270	>32	-

MEETING MINUTES

SUBJ: RANCHO SECO REACTOR VESSEL PRESSURIZED THERMAL SHOCK

DATE: THURSDAY, JULY 14, 1988

LOCATION: NRC HEADQUARTERS, ROCKVILLE, MD

PARTICIPANTS: STEVE RUYTER, SMUD
ART LOWE, B&W
JIM TAYLOR, B&W
C.Y. CHENG, NRC
SAM LEE, NRC
PRYORN RANDALL, NRC
MICHAEL MAYFIELD, NRC
KEITH WICHMAN, NRC
BARRY ELLIOT, NRC
GEORGE KALMAN, NRC

DISCUSSION: The meeting was requested by the NRC staff to discuss apparent discrepancies in the value for the pressurized thermal shock initial reference temperature (RTpts) for WF-70 weld material. The Rancho Seco USAR assumes 0 degrees F. as the initial RTpts (measured value not available). SMUD correspondence (2/23/88 ltr to E. Southard) and B&W publications (BAW-1975 and BAW-1920P) indicate that the initial RTpts may be 58 degrees F. If the initial RTpts is revised to 58 degrees F., the Rancho Seco reactor vessel would be subject to the screening criteria per 10 CFR 50.61 during the next several years.

B&W presented proprietary graphs which included initial RTpts test results for WF-70. Some of the test results indicated that the initial RTpts may be as high as 74 degrees F. When asked what their initial RTpts estimate would be, based on available test results; B&W replied that their best estimate is 23 degrees F.

A caucus by the NRC participants following the joint meeting concluded that:

- (1) Based on the presented B&W test data, 0 degrees F. does not appear to be an appropriate initial RTpts (a higher temp. would be expected).
- (2) The NRC participants can not determine from the data presented what the initial RTpts should be.
- (3) The NRC will continue to review this issue internally and send any additional conclusions to SMUD/B&W.

George Kalman

Mr. Henry D. Hukill
GPU Nuclear Corporation

Three Mile Island Nuclear Station,
Unit No. 1

cc:

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