Docket File

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 9, 1997

52-003

Mr. Nicholas J. Liparulo, Manager
Nuclear Safety and Regulatory Analysis
Nuclear and Advanced Technology Division
Westinghouse Electric Corporation
P.O. Box 355
Pittsburgh, PA 15230

SUBJECT: DATA TO SUPPORT AP600 PASSIVE RESIDUAL HEAT REMOVAL (PRHR) HEAT EXCHANGER HEAT TRANSFER CORRELATIONS ANALYSES

Dear Mr. Liparulo:

In a Nuclear Regulatory Commission (NRC) letter to Westinghouse dated February 19, 1997, the staff requested that Westinghouse compare the AP600 PRHR heat exchanger heat transfer correlation with experimental data from a "C" tube heat exchanger design to confirm the validity of the analytical models. In our letter, the staff offered Westinghouse data from the ROSA test facility as a potential source of data which may contain sufficient information to permit confirmation of the PRHR heat transfer correlation.

Based on review of technical literature, Westinghouse states that data are not available in the public domain for a "C" tube heat exchanger design at thermal conditions for comparison to the AP600 PRHR heat exchanger. Consequently, Westinghouse letter dated April 15, 1997, requests that the staff provide PRHR data from two ROSA tests (AP-BO-01 station blackout and AP-CL-04 1/2 inch cold leg break) to support the PRHR additional heat transfer analysis.

The staff has obtained data from the two ROSA tests cited above which it believes Westinghouse can use to predict the performance of the ROSA PRHR heat exchanger. Specifically, the staff has extracted representative data for mass flow, primary pressure, inlet temperature, and in-containment refueling water storage tank temperatures during stable PRHR operational periods for the BO-01 and CL-04 ROSA tests (Enclosure 1). Westinghouse is requested to predict the PRHR outlet temperature and primary system temperature for various locations along the ROSA "C" tubes based on the heat transfer correlation it is using for the PRHR design basis (Enclosure 2). The results will be compared with actual data from the ROSA test (which will not be provided to Westinghouse) as part of the staff's safety evaluation of the PRHR performance modeling.

You have requested that portions of the information submitted in the June 1992 application for design certification be exempt from mandatory public disclosure. While the staff has not completed its review of your request in accordance with the requirements of 10 CFR 2.790, that portion of the submitted information is being withheld from public disclosure pending the staff's final determination. The staff concludes that the enclosed information do not contain those portions of the information for which exemption is sought. However, the staff will withhold this letter from public disclosure for 30 calendar days from the date of this letter to allow Westinghouse the

DF03

opportunity to verify the staff's conclusions. If, after that time, you do not request that all or portions of the information in the enclosures be withheld from public disclosure in accordance with 10 CFR 2.790, this letter will be placed in the NRC Public Document Room.

If you have any questions regarding this matter, you can contact me at (301) 415-1141.

Sincerely,

original signed by:

William C. Huffman, Project Manager
Standardization Project Directorate
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Docket No. 52-003

Enclosures: As stated

cc w/enclosures:
See next page

DISTRIBUTION: *Enclosure to be held for 30 days

*Docket File	PDST R/F	MSlosson
PUBLIC	SWeiss	TRQuay
TKenyon	BHuffman	JSebrosky
DJackson	JMoore, O-15 B18	WDean, O-17 G21
ACRS (11)	TMartin, O-12 G18	JLyons, O-8 E23
GHolahan, O-8 E2	FEltawila, T-10 E46	WHodges, O-10 E37
DHassell, O-15 B18	ALevin, O-8 E23	

DOCUMENT NAME: A:DATA-ROS.A
To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	PM:PDST:DRPM		SC:SRXB:DSSA		D:PDST:DRPM					
NAME	WCHuffman:sg		ALevin		TRQuay TRQ					
DATE	05/8/97		05/ /97		05/ 9/97					

OFFICIAL RECORD COPY

Mr. Nicholas J. Liparulo
Westinghouse Electric Corporation

Docket No. 52-003
AP600

cc: Mr. B. A. McIntyre
Advanced Plant Safety & Licensing
Westinghouse Electric Corporation
Energy Systems Business Unit
P.O. Box 355
Pittsburgh, PA 15230

Ms. Cindy L. Haag
Advanced Plant Safety & Licensing
Westinghouse Electric Corporation
Energy Systems Business Unit
Box 355
Pittsburgh, PA 15230

Mr. M. D. Beaumont
Nuclear and Advanced Technology Division
Westinghouse Electric Corporation
One Montrose Metro
11921 Rockville Pike
Suite 350
Rockville, MD 20852

Mr. S. M. Modro
Nuclear Systems Analysis Technologies
Lockheed Idaho Technologies Company
Post Office Box 1625
Idaho Falls, ID 83415

Enclosure to be distributed to the following addressees after the result of the proprietary evaluation is received from Westinghouse:

Mr. Ronald Simard, Director
Advanced Reactor Programs
Nuclear Energy Institute
1776 Eye Street, N.W.
Suite 300
Washington, DC 20006-3706

Ms. Lynn Connor
DOC-Search Associates
Post Office Box 34
Cabin John, MD 20818

Mr. Robert H. Buchholz
GE Nuclear Energy
175 Curtner Avenue, MC-781
San Jose, CA 95125

Mr. James E. Quinn, Projects Manager
LMR and SBWR Programs
GE Nuclear Energy
175 Curtner Avenue, M/C 165
San Jose, CA 95125

Mr. Sterling Franks
U.S. Department of Energy
NE-50
19901 Germantown Road
Germantown, MD 20874

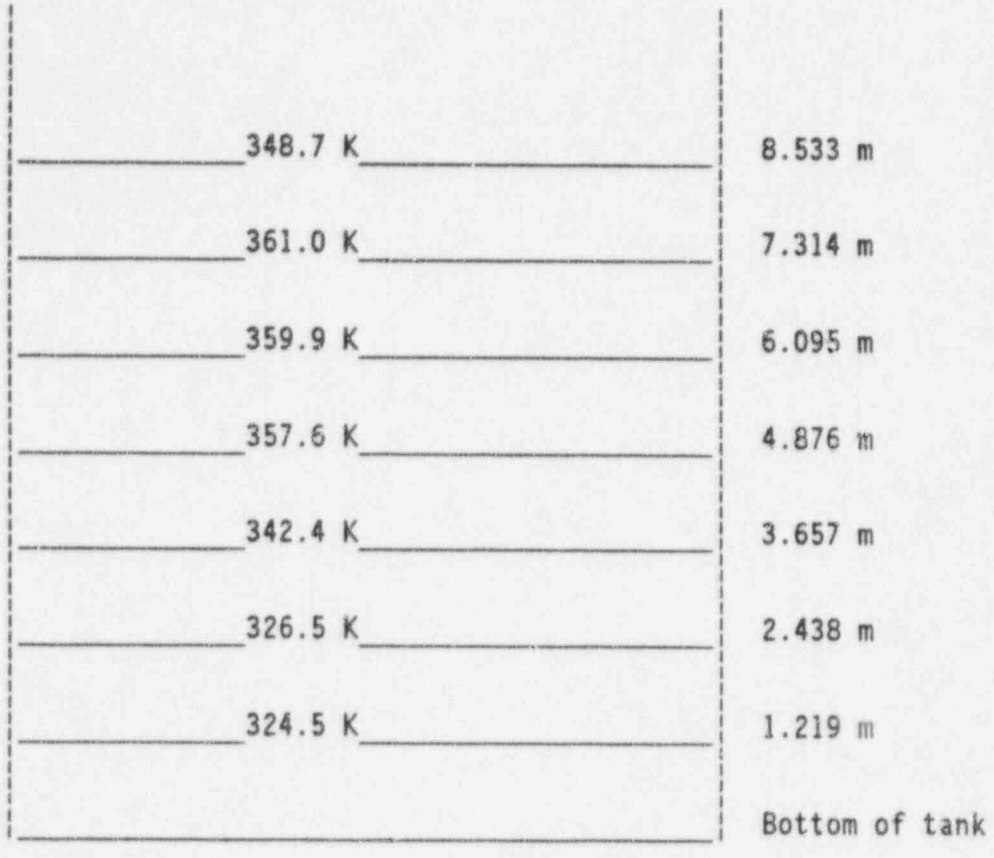
Barton Z. Cowan, Esq.
Eckert Seamans Cherin & Mellott
600 Grant Street 42nd Floor
Pittsburgh, PA 15219

Mr. Charles Thompson, Nuclear Engineer
AP600 Certification
NE-50
19901 Germantown Road
Germantown, MD 20874

Mr. Frank A. Ross
U.S. Department of Energy, NE-42
Office of LWR Safety and Technology
19901 Germantown Road
Germantown, MD 20874

Mr. Ed Rodwell, Manager
PWR Design Certification
Electric Power Research Institute
3412 Hillview Avenue
Palo Alto, CA 94303

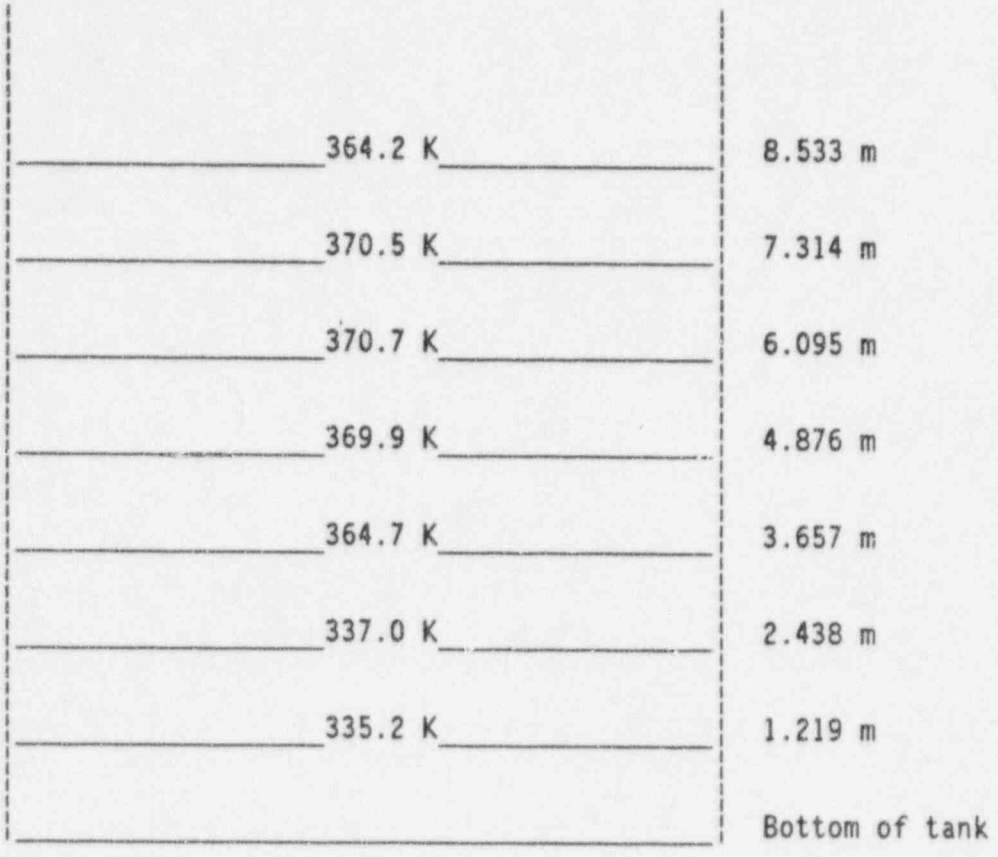
Test BO-01 @ 15,000 s



Inlet flow: 1.38 kg/s
Inlet temperature: 444.9 K
Pressure: 5.4 MPa

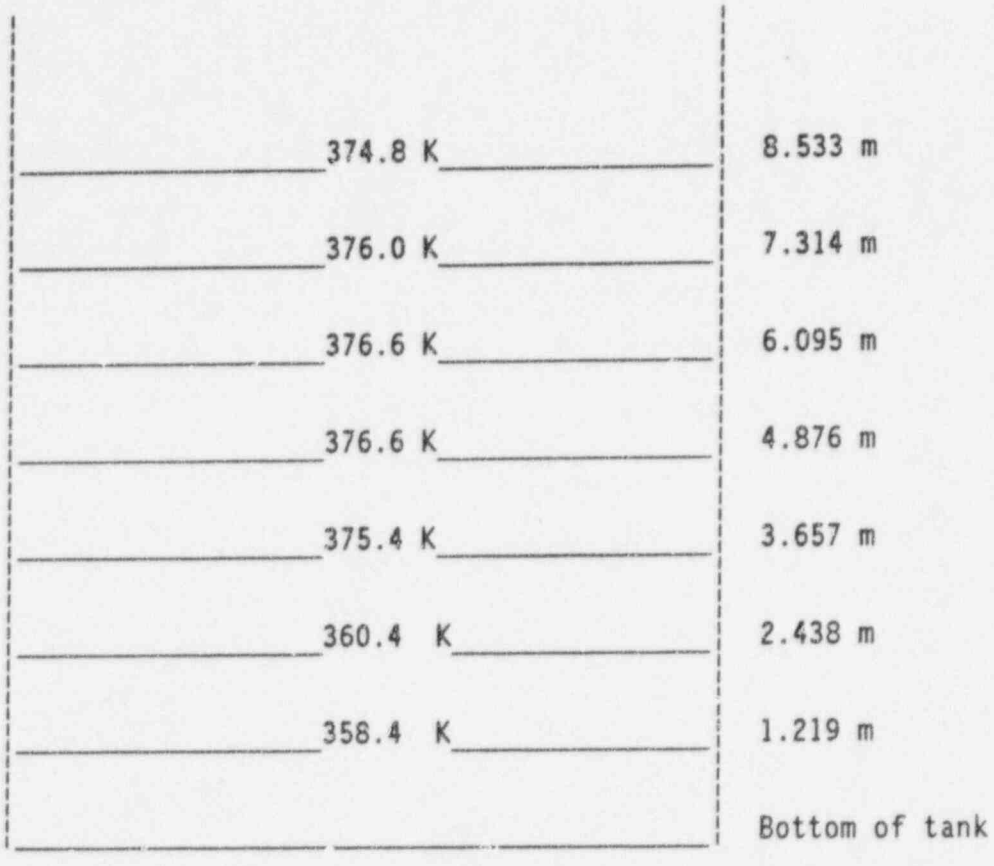
Enclosure 1

Test BO-01 @ 19,000 s



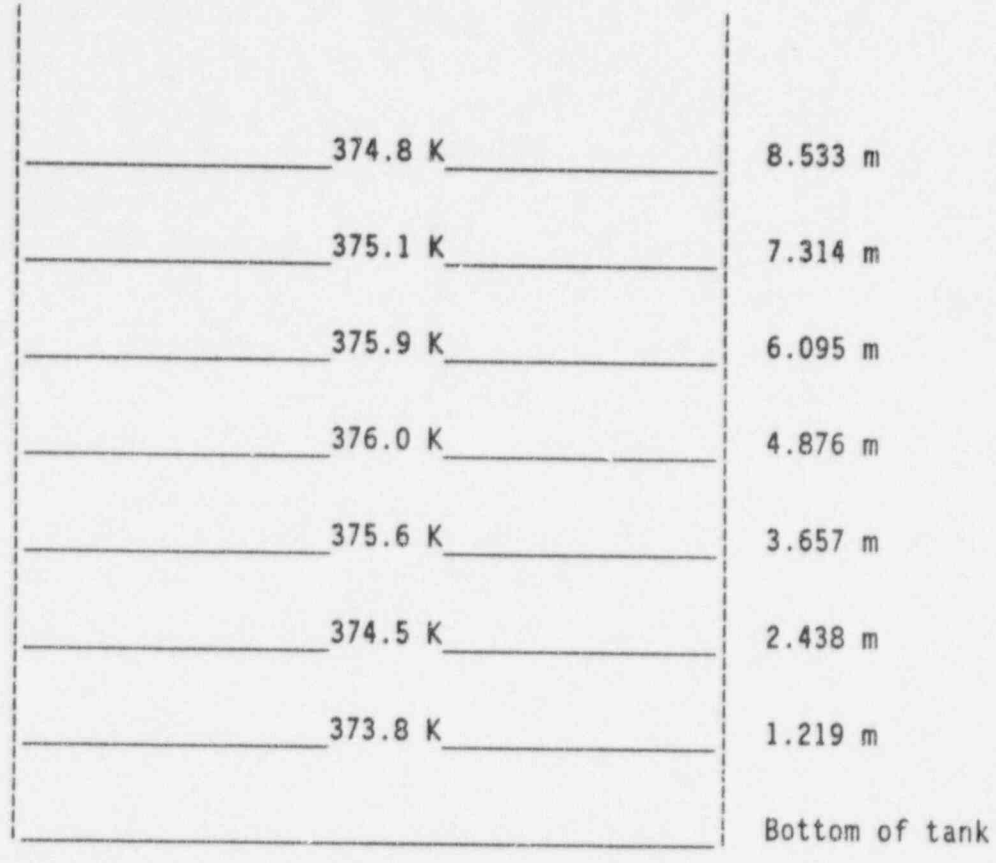
Inlet flow: 1.34 kg/s
Inlet temperature: 445.6 K
Pressure: 4.8 MPa

Test B0-01 @ 30,000 s



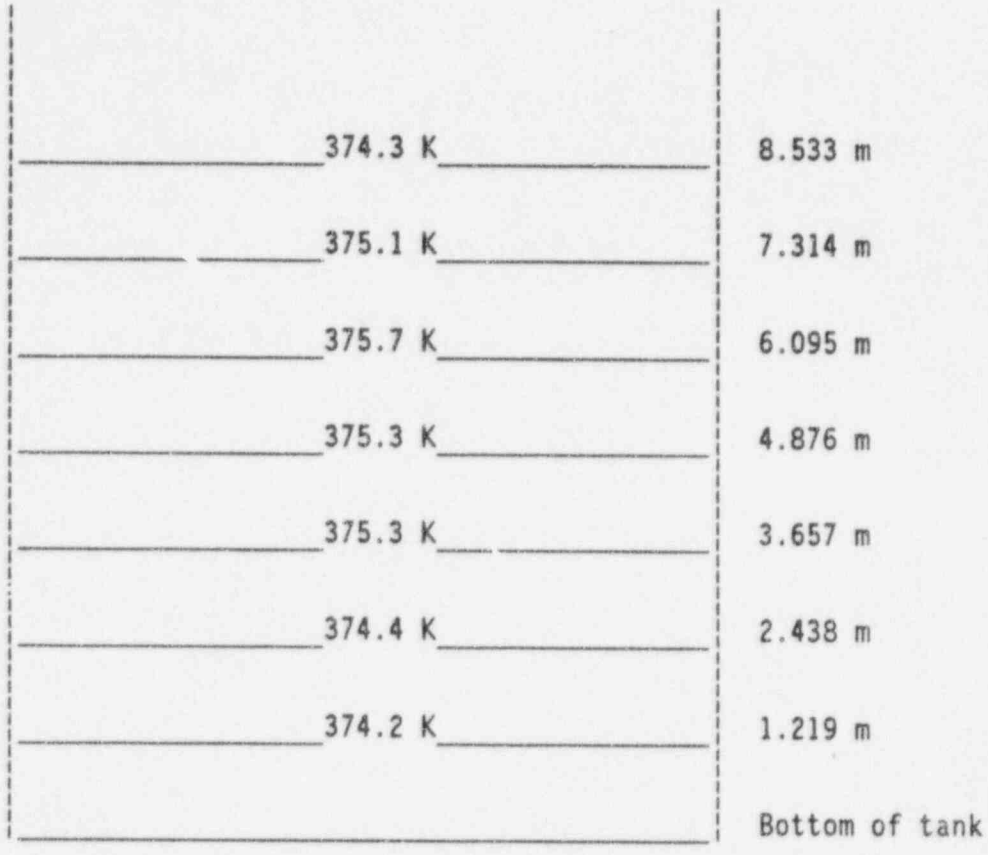
Inlet flow: 1.27 kg/s
Inlet temperature: 445.8 K
Pressure: 3.2 MPa

Test BO-01 @ 45,000 s



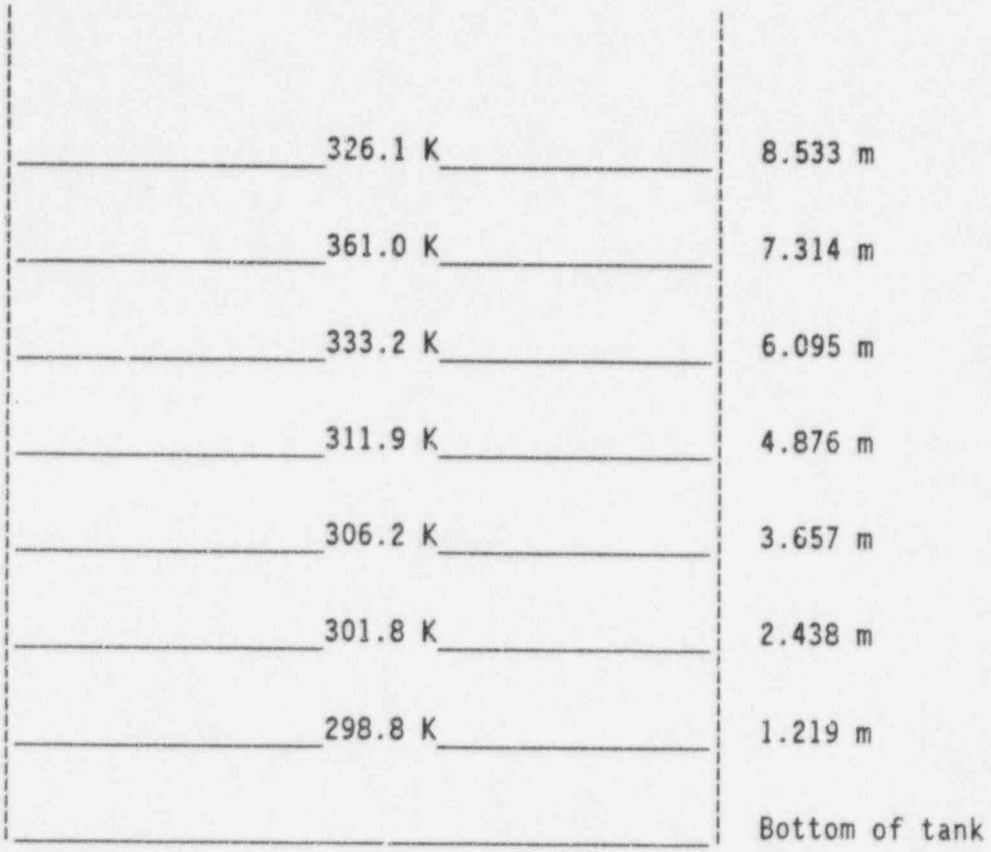
Inlet flow: 1.23 kg/s
Inlet temperature: 447.5 K
Pressure: 2.3 MPa

Test B0-01 @ 49,000 s



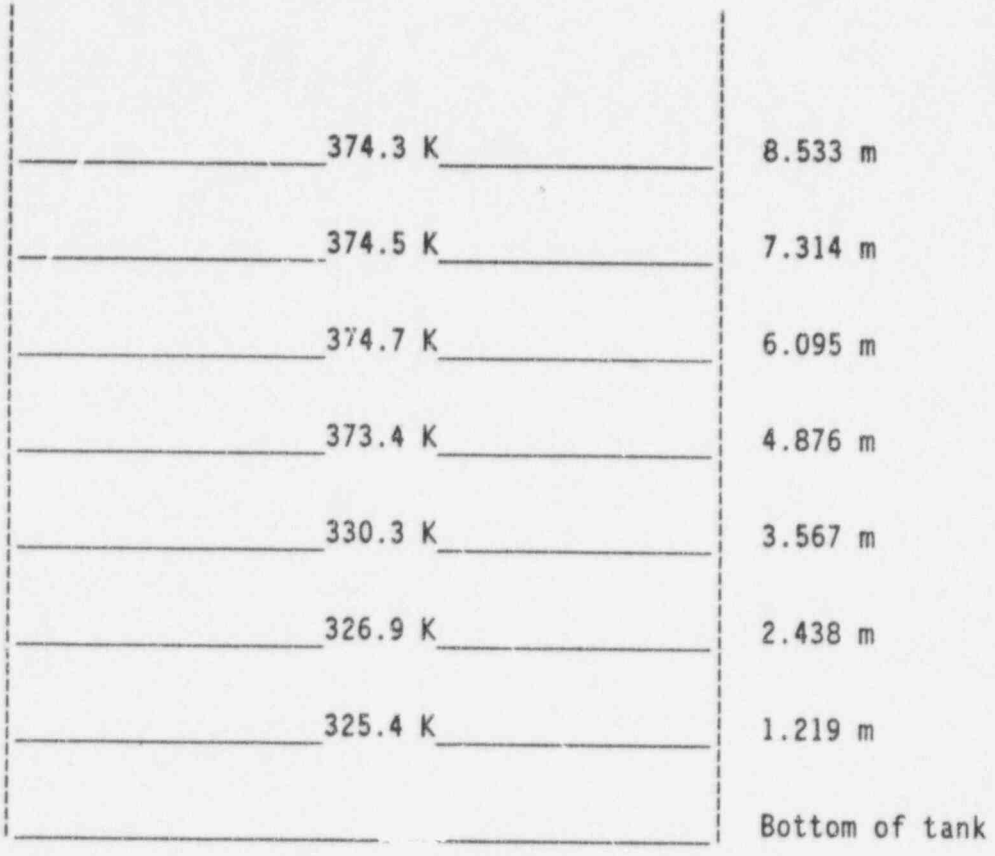
Inlet flow: 1.23 kg/s
Inlet temperature: 448.0 K
Pressure: 2.1 MPa

Test CL-04 @ 2,000 s



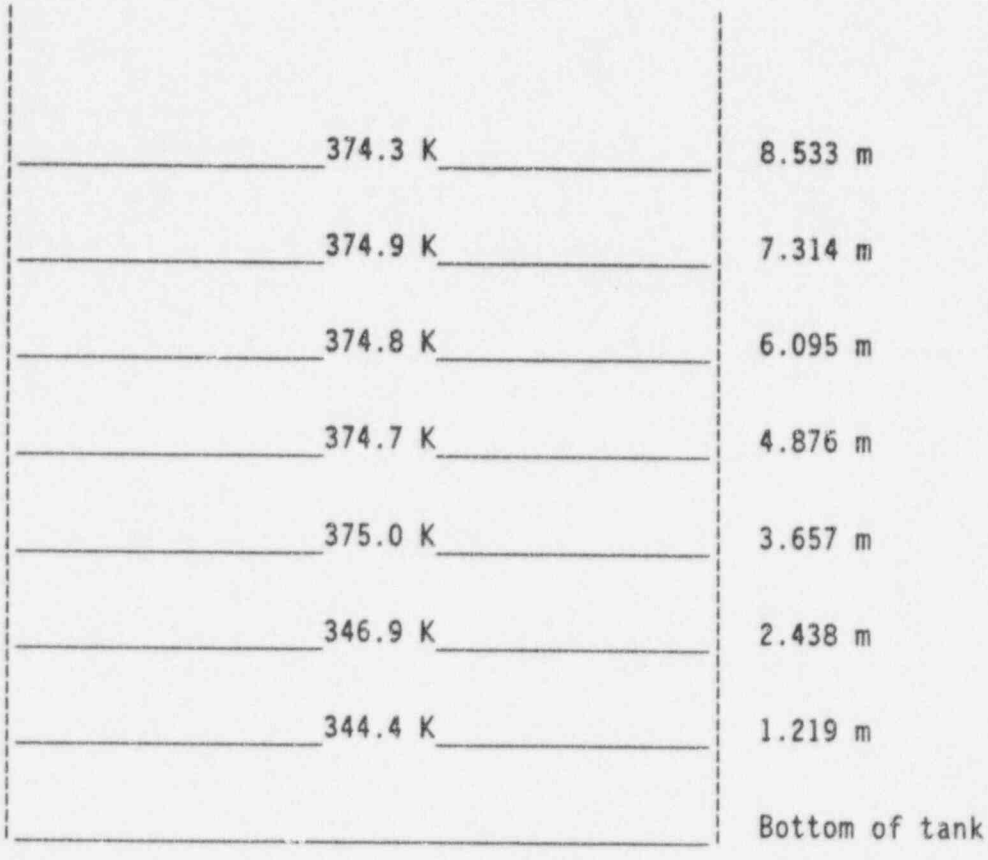
Inlet flow: 2.14 kg/s
Inlet temperature: 537.9 K
Pressure: 8.2 MPa

Test CL-04 @ 8,000 s



Inlet flow: 1.55 kg/s
Inlet temperature: 459.1 K
Pressure: 3.6 MPa

Test CL-04 @ 14,000 s



Inlet flow: 1.41 kg/s
Inlet temperature: 447.0 K
Pressure: 2.4 MPa

Additional Information on the Test Conditions

1) System pressures are absolute.

2) The flow represents the flow through all ROSA heat exchanger tubes for both tests.

3) The initial IRWST water level for AP-BO-01 was 8.20 m. At 22,000 s seconds, the water level began to decrease to a final level of 8.00 m at 49,000 s due to boil-off.

4) The IRWST water level for AP-CL-04 was relatively constant at 7.48 m throughout the data range provided.

Westinghouse is requested to predict the following information based on the heat transfer correlation it is using for its AP600 design basis calculations.

AP-BO-01

Time	15,000 s	19,000 s	30,000 s	45,000 s	49,000 s
PRHR Outlet Temp					
Primary Temperature at 1.52 meters					
Primary Temperature at 3.52 meters					
Primary Temperature at 6.20 meters					

AP-CL-04

Time	2000 S	8000 S	14.000 S
PRHR Outlet Temp			
Primary Temperature at 1.52 meters			
Primary Temperature at 3.52 meters			
Primary Temperature at 6.20 meters			

Westinghouse should predict the primary fluid temperatures for an average middle tube as measured along the length of the tube starting from the inside tank wall to points at 1.52 m, 3.52 m, and at 6.20 m along the length of the tube.

Enclosure 2