



Westinghouse  
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Energy Systems

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NSD-NRC-96-4685  
DCP/NRC0492  
Docket No.: STN-52-003

April 4, 1996

Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

ATTENTION: T. R. QUAY

SUBJECT: AP600 LARGE BREAK LOCA PHENOMENA IDENTIFICATION AND RANKING TABLE

Reference 1: WCAP-14171, WCOBRA/TRAC Applicability to AP600 Large-Break Loss-of-Coolant Accident

Reference 2: Westinghouse Letter NTD-NRC-95-4442, "Response to RAI Concerning WCAP-12945", dated April 24, 1995

Dear Mr. Quay:

The enclosed table provides the Phenomena Identification and Ranking Table (PIRT) for the AP600 Large Break Loss of Coolant Accident (LBLOCA). The PIRT was previously provided as part of References 1 and 2 and has been revised in response to discussions between Westinghouse and NRC during a March 15, 1996 meeting. This revised PIRT is provided at this time for NRC staff review and will be included in a revision to WCAP-14171, "WCOBRA/TRAC Applicability to AP600 LOCA" to be issued by July 31, 1996. This submittal closes the action item from the March 15, 1996 meeting.

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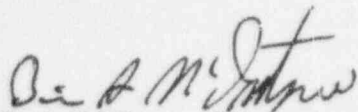
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1/1 per S Fridley*

April 4, 1996

Please contact John C. Butler on (412) 374-5268 if you have any questions concerning this transmittal.



B. A. McIntyre, Manager  
Advanced Plant Safety and Licensing

/nja

Enclosures  
Attachment

cc: T. Kenyon, NRC (w/o Enclosures/Attachments)  
W. Huffman, NRC (1E1, 1E2)  
R. C. Jones, NRC (w/o Enclosures/Attachments)  
G. D. McPherson, NRC (w/o Enclosures/Attachments)  
F. Eltawila, NRC (w/o Enclosures/Attachments)  
L. Lois, NRC (1E1)  
P. Boehnert, ACRS (1E1)  
N. J. Liparulo, Westinghouse (w/o Enclosures/Attachments)

TABLE 2-3

PIRT FOR LARGE BREAK PROCESSES  
CURRENT PLANTS VS. AP600

Process	BLD	BLD	BLD	RFL	RFL	RFL	RFD	RFD	RFD
	EXPERT	AP600	W3&4 LOOP	EXPERT	AP600	W3&4 LOOP	EXPERT	AP600	W3&4 LOOP
<b>FUEL ROD</b>									
Stored Energy	9	9	9		5	5			
Oxidation							8	5	7
Decay Heat					5	5	8	8	8
Reactivity - Void		6	6						
Reactivity - Boron								5	5
Gap Conductance		8	8				8		
<b>CORE*</b>									
DNB		8	8						
Post-CHF	7	8	8	8	8	8			
Rewet	8	7	6	7	5	5			
Reflood Heat Transfer							9	7	9
Nucleate Boiling									
1-Phase Vapor Natural Circ.									
3-D Flow		7	7				9	5	5
Void Generation/Dist.		7	7				9		
Entrainment/Deentrainment								6	8
Flow Reversal/Stagnation		8	8						
Radiation Heat Transfer									
Level								8	8
<b>UPPER HEAD</b>									
Initial Water Temperature		8	5						
Flow Path Area		8	5						
Blowdown Flow		8	5						
<b>UPPER FLENUM</b>									
Hot Assembly Location		7	7						
Entrainment/Deentrainment							9	6	6
Phase Separation								6	6
CCF Drain/Fallback									
2-Phase Convection									

\*Core heat transfer includes the effects of spacer grids.

TABLE 2-3 (Continued)

PIRT FOR LARGE BREAK PROCESSES  
CURRENT PLANTS VS. AP600

Process	BLD	BLD	BLD	RFL	RFL	RFL	RFD	RFD	RFD
	EXPERT	AP600	W3&4 LOOP	EXPERT	AP600	W3&4 LOOP	EXPERT	AP600	W3&4 LOOP
<b>HOT LEG</b>									
Entrainment/Deentrainment							9		
Flow Reversal		5	5						
Void Distribution									
2-Phase Convection									
<b>PRESSURIZER</b>									
Early Quench/Flow	7	5	5						
Critical Flow in SL									
Flashing									
ADS Interaction		N/A			N/A			N/A	
<b>STEAM GENERATOR</b>									
Steam Binding							9	7	7
Delta P, Form Losses									
PRHR									
<b>PUMP</b>									
2-Phase Performance	9	5	5						
Delta P, Form Losses		8	8		5	5	8	7	7
<b>COLD LEG/ ACCUMULATOR</b>									
Condensation				9	N/A	8		-	5
Non-Condensable Gases							9	5	5
Discharge					8	8		9	6
Flow Asymmetries		6	5						
HPI Mixing									
CMT Mixing/Interaction					N/A			N/A	
<b>DOWNCOMER</b>									
Entrainment/Deentrainment				8	8	8		6	7
Condensation				9	8	8			
Countercurrent, Siug, Noneq.					8	8			
Hot Wall (Vessel/Barrel)				5			7	7	7
Hot Wall (Radial Reflector)								5	
2-Phase Convection									

TABLE 2-3 (Continued)

PIRT FOR LARGE BREAK PROCESSES  
CURRENT PLANTS VS. AP600

Process	BLD	BLD	BLD	RFL	RFL	RFL	RFD	RFD	RFD
	EXPERT	AP600	W3&4 LOOP	EXPERT	AP600	W3&4 LOOP	EXPERT	AP600	W3&4 LOOP
Saturated Nucleate Boiling									
3-D Effects		5	5	9	8	8			
Flashing									
Liquid Level Oscillations								7	7
Direct Vessel Injection - ACCUM	-				8		-	7	-
IRWST Mixing	-	N/A			N/A		-	N/A	-
CMT Mixing/Interaction	-	-			N/A		-	N/A	-
<b>LOWER PLENUM</b>									
Sweep Out				7	6	6			
Hot Wall							7	7	7
Multi-dimensional Effects									
<b>BREAK</b>									
Critical Flow	9	9	9	7	6	6			
Flashing									
Containment Pressure								6	8
ADS Flow	-	N/A	-	-	N/A		-	N/A	-
<b>LOOP</b>									
2-Phase Delta-P	7								
Oscillations				7			9		
Flow Split		8	8	7	5	5			