Initial Condition for US-APWR's SBLOCA Analysis using M-RELAP5

(Non-Proprietary)

Table1 Initial Condition (Main Parameters)

No.	Parameters		Target value		M-RELAP5 calculated value		Error		Criteria	corresponding parameter in M-RELAP5
1	Core power									
2	Pressurizer pressure									
3	Secondary pressure	A-loop								
		B-loop								
4	RCS average Temperature (Tave)	A-loop								
		B-loop								
5	RV outlet Temperature (Thot) at Nominal power	A-loop								
		B-loop								
6	RV inlet Temperature (Tcold) at Nominal power	A-loop								
		B-loop								
7	ΔT at Nominal power	A-loop								
		B-loop								
8	RV upper head temperature									
9	Loop flow rate	A-loop								
		B-loop								
10	Pressurizer water mass									

Table2 Initial Condition (Coolant Flows in RV)

No.	Parameters	Target value	M-RELAP5 calculated value	Error	Criteria	corresponding parameter in M-RELAP5
1	Core flow rate					
2	Upper head bypass flow rate					
3	Neutron-Reflector's cooling holes flow rate					
4	Flow rate in Control rod guide thimbles and Neutron-Reflector gap between Neutron-Reflector's outer surface and core-barrel inner surface					

Table3 Initial Condition (Pressure drop) (1/2)

No.	Locations / Components		Target value		M-RELAP5 calculated value		Error		Criteria	corresponding parameter in M-RELAP5
1	RV inlet nozzle		5.56	psi						
2	Downcomer		0.47	psi						
3	Lower plenum		7.22	psi						
4	Lower core support plate		8.94	psi						
5	Core inlet		1.46	psi						
6	Core		20.14	psi						
7	Core outlet		0.54	psi						
8	Total core, inlet to outlet		22.14	psi						
9	Upper core plate		4.98	psi						
10	Upper plenum		0.66	psi						
11	RV outlet nozzle		2.09	psi						
12	Total RV, inlet to outlet		52.06	psi						
13	Hot leg	A-loop	1.64	psi						
		B-loop								
14	SG inlet plenum nozzle	A-loop	6.68	psi						
		B-loop								
15	SG U-tube inlet	A-loop	0.47	psi						
		B-loop								

* A-loop = broken loop

B-loop = intact loop

Table3 Initial Condition (Pressure drop) (2/2)

No.	Locations / Components		Target value		M-RELAP5 calculated value		Error		Criteria	corresponding parameter in M-RELAP5
16	SG U-tube	A-loop	29.87	psi						
		B-loop								
17	SG U-tube outlet	A-loop	0.82	psi						
		B-loop								
18	SG outlet plenum nozzle	A-loop	3.40	psi						
		B-loop								
19	Crossover leg	A-loop	3.44	psi						
		B-loop								
20	Cold leg	A-loop	1.42	psi						
		B-loop								
21	Total, entire loops	A-loop	47.74	psi						
		B-loop								
22	RCP head	A-loop	99.79	psi						
		B-loop								
23	Upper head spray nozzle		34.96	psi						
24	Control rod guide tube		8.79	psi						

* A-loop = broken loop

B-loop = intact loop

Table4 Initial Condition (Fuel Pellet Temperature)

No.	Parameters	Target value	M-RELAP5 calculated value	Error	Criteria	corresponding parameter in M-RELAP5
1	Pellet average temperature (average-power core)					
2	Pellet average temperature (hot assembly)					
3	Pellet average temperature (hot rod)					

Table5 Initial Condition (SG Secondary Side)

No.	Parameters		Target value		M-RELAP5 calculated value		Error		Criteria	corresponding parameter in M-RELAP5
1	Recirculation ratio	A-loop								
		B-loop								
2	SG secondary mass	A-loop								
		B-loop								
3	Heat transfer rate from primary to secondary (one-loop)	A-loop								
		B-loop								
4	Main steam flow rate at Nominal power	A-loop								
		B-loop								
5	Main feed water flow rate at Nominal power	A-loop								
		B-loop								