Summary of BNL Results for Standard Problem 5

(BWR Mark II)

Ji-Wu Yang
Department of Nuclear Energy
Brookhaven National Laboratory
Upton, New York 11973

Telephone (516) 282-2616
FTS 666-2616

The BWR Mark II containment loads were calculated using the MARCH 1.1/ CORCON codes. The Standard Problem conditions and the summary of the computed results are shown in Table 1. Based on the sensitivity studies, the following conclusions are made:

1. Type of Concrete - Higher containment temperatures and pressures are encountered with the limestone concrete.

2. Free H_2O - A higher percentage of free water levels to high containment temperatures and pressures.

3. Corium Temperature and Spread - The higher temperature corium which spreads further leads to higher containment atmospheric temperatures and pressures.

4. Pool Loss - A higher percentage of pool loss implies less corium/ concrete interactions and reduces the containment pressures and temperatures. The suppression pool remains at a subcooled state during the entire transient.

The uncertainties of the base case (Case 5) are shown in Table 2. The high, low, and medium values are approximated by considering the basic assumptions and uncertainties of the analyses.

Table 1 Summary of BWR Mark II Standard Problem Results

	Mark II (TQUV)							
Case	5	5a	5c	5d	6	7	7a	8
Corium Spread (m)	5				3	5		3
Debris Temperature (°F)	4130				2700	4130		2700
Concrete Type	L				L	B		B
Free H_2O (%)	3	6			3	4	8	4
Steel in Corium (lb)	140K				140K	140K		140K
Pool Losses (%)	0		25	50	0	0		0
Results								
Peak Pressure (psia)	130	135	102	83	118	114	140	94
Peak Temperature (°F)								
Drywell Atmosphere	623	670	570	510	600	480	585	450
Drywell Concrete	320	330	305	280	340	310	325	280
Drywell Steel Liner	315	330	275	265	330	280	325	280
Wetwell Atmosphere	360	360	345	335	345	345	355	345

Table 2 Uncertainty of Base Case (Case 5)

	Peak Pressure (psia)	Peak Drywell Temperature (°F)
High	145*	800
Low	100	600
Medium	135	720

*Assumed containment failure pressure.