

**SPAR Special Event Data and Results
2010 Parameter Estimation Update**

Special Event Name	Description	Data Source	Data			Industry-average Probability or Rate Distribution (note a)									Comments (see Appendix C for details)	Effective Date
			Failures	Demands or Hours	d or h	Distribution (note b)	Mean	α	β	Error Factor	Rounded Mean (note c)	Rounded α (note c)	β (note d)	Error Factor		
TDP-PRST (RCIC)	RCIC TDP probability of restart	SS	6	47	d	Beta (Jeffreys, Jeffreys)	1.35E-01	6.500	4.150E+01	1.7	1.5E-01	6.0	3.40E+01	1.7		Feb-07
TDP-FRST (RCIC)	RCIC TDP restart failure per event	SS	1	17	d	Beta (Jeffreys, SCNID)	8.33E-02	0.500	5.500E+00	7.2	8.0E-02	0.5	5.75E+00	7.3		Feb-07
TDP-FRFRST (RCIC)	RCIC failure to recover TDP restart failure	SS	0	1	d	Beta (Jeffreys, SCNID)	2.50E-01	0.500	1.500E+00	4.7	2.5E-01	0.5	1.50E+00	4.7		Feb-07
MOV-PMINJ (RCIC)	RCIC injection valve probability of multiple injections	SS	14	28	d	Beta (EB/YL/KS, EB/YL/KS)	5.03E-01	4.180	4.130E+00	1.5	5.0E-01	4.0	4.00E+00	1.5		Feb-07
MOV-FTRO (RCIC)	RCIC injection valve fails to reopen	SS	1	38	d	Beta (Jeffreys, SCNID)	3.85E-02	0.500	1.250E+01	7.9	4.0E-02	0.5	1.20E+01	7.9		Feb-07
MOV-FRFTRO (RCIC)	RCIC failure to recover injection valve failure to reopen	SS	1	1	d	Beta (Jeffreys, SCNID)	7.50E-01	0.500	1.667E-01	1.1	8.0E-01	0.5	1.25E-01	1.0		Feb-07
SUC-FTFRI (RCIC)	RCIC failure to transfer back to injection mode (pump recirculation valve)	SS	1	198	h	Gamma (Jeffreys, SCNID)	7.58E-03	0.500	6.598E+01	8.4	8.0E-03	0.5	6.20E+01	8.4	Note that this is per hour. Failure occurred 8 min after RCIC initiation.	Feb-07
SUC-FRFTFR (RCIC)	RCIC failure to recover transfer failure	SS	0	1	d	Beta (Jeffreys, SCNID)	2.50E-01	0.500	1.500E+00	4.7	2.5E-01	0.5	1.50E+00	4.7		Feb-07
MOV-PMINJ (HPCI)	HPCI injection valve probability of multiple injections	SS	2	17	d	Beta (Jeffreys, SCNID)	1.39E-01	0.500	3.100E+00	6.4	1.5E-01	0.5	2.83E+00	6.2		Feb-07
MOV-FTRO (HPCI)	HPCI injection valve fails to reopen	SS	1	8	d	Beta (Jeffreys, SCNID)	1.67E-01	0.500	2.500E+00	6.0	1.5E-01	0.5	2.83E+00	6.2		Feb-07
MOV-FRFTRO (HPCI)	HPCI failure to recover injection valve failure to reopen	SS	1	1	d	Beta (Jeffreys, SCNID)	7.50E-01	0.500	1.667E-01	1.1	8.0E-01	0.5	1.25E-01	1.0		Feb-07
SUC-FTFR (HPCI)	HPCI failure to transfer	SS	0	1270	d	Beta (Jeffreys, SCNID)	3.93E-04	0.500	1.271E+03	8.4	4.0E-04	0.5	1.25E+03	8.4		Feb-07
SUC-FRFTFR (HPCI)	HPCI failure to recover transfer failure	SS	0	0	d	Beta (Jeffreys, SCNID)	5.00E-01	0.500	5.000E-01	2.0	5.0E-01	0.5	5.00E-01	2.0		Feb-07
SUC-FTFR (HPCS)	HPCS failure to transfer	SS	1	478	d	Beta (Jeffreys, SCNID)	3.13E-03	0.500	1.592E+02	8.4	3.0E-03	0.5	1.66E+02	8.4		Feb-07
SUC-FRFTFR (HPCS)	HPCS failure to recover transfer failure	SS	1	1	d	Beta (Jeffreys, SCNID)	7.50E-01	0.500	1.667E-01	1.1	8.0E-01	0.5	1.25E-01	1.0		Feb-07

Acronyms - EB (empirical Bayes), HPCI (high-pressure coolant injection), HPCS (high-pressure core spray), KS (Kass-Steffey), MOV (motor-operated valve), RCIC (reactor core isolation cooling), SCNID (simplified constrained noninformative distribution), SUC (suction), SS (updated system study), TDP (turbine-driven pump), YL (year level)

Note a - If these distributions are to be used as priors in Bayesian updates using plant-specific data, then a check for consistency between the prior and the data should be performed first, as suggested in supporting requirement DA-D4c in Reference 59 in NUREG/CR-6928 and outlined in Section 6.2.3.5 in Reference 17 in NUREG/CR-6928.

Note b - The format for the distributions is the following: distribution type (source for mean, source for α factor).

Note c - The value is rounded to 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, or 9.0 times the appropriate power of ten.

Note d - The β factor is determined from mean and α . The β factor is presented to three significant figures to preserve the mean of the distribution.