

Results and Databases Trend Summary

2017

1 INTRODUCTION

The following is a summary of the reliability and frequency trends identified in the update reports provided on the NRC Operating Experience web site. The statistically significant¹, either increasing or decreasing, trends identified in each update report are provided here in a single location. The figure numbers called out for the significant trends are the figure numbers in the separate update reports. Starting 2016 update year the frequency of the component and system performance updates is shifting to every other year. The loss of offsite power (LOOP) and initiating event updates continue to be annual.

2 COMPONENT PERFORMANCE

The component performance study including trending analysis is now performed every other year. There was no component trending analysis for 2017. A summary of the latest component trending analysis results can be obtained from the Summary of Significant Trends for 2016 report, which used data from 2007 through 2016.

3 LOSS OF OFFSITE POWER EVENTS

There are no statistically significant¹ 10-year trends identified in critical operation LOOP frequencies for all LOOP categories or any of the four LOOP categories over the 2008-2017 period.

The 1997–2017 post-deregulation LOOP durations exhibit highly significant increasing trend, driven by the switchyard- and grid-based events.

4 RATES OF INITIATING EVENTS

The trend in occurrence rates for the categories of initiating events are summarized in this section. Sixteen initiating event categories are trended and displayed. Note that the LOOP trend presented here is the trend for all LOOP categories combined, and include only initiating events, whereas the events considered in the LOOP study above are all events during critical operation.

¹ Statistical significance is defined in terms of the ‘p-value.’ A p-value is a probability indicating whether to accept or reject the null hypothesis that there is no trend in the data. P-values of less than or equal to 0.05 indicate that we are 95% confident that there is a trend in the data (reject the null hypothesis of no trend.) By convention, we use the "Michelin Guide" scale: p-value < 0.05 (statistically significant), p-value < 0.01 (highly statistically significant); p-value < 0.001 (extremely statistically significant).

Table 1 summarizes the p-values for each initiating event category. A statistically significant decreasing trend is identified for BWR stuck open stuck open safety relief. A highly statistically significant decreasing trend is identified for PWR general transients.

Table 1. Summary of initiating event trend figures.

Figure	Description	p-value	Trend Direction	Trend Significance
1	LOOP - Loss of Offsite Power	0.523	--	
2	LOAC - Loss of AC Power	0.882	--	
3	LODC - Loss of DC Power	0.606	--	
4	VSLOCA – Very Small Loss of Coolant Accident	1.000	--	
5	PLOCCW - Partial Loss of Component Cooling Water	0.371	--	
6	LOMFW - Loss of Main Feedwater	0.520	--	
7	PLOSWS - Partial Loss of Service Water System	1.000	--	
8	LOIA (BWR) - Loss of Instrument Air (BWR)	0.195	--	
9	SORV (BWR) - Stuck Open Relief Valve (BWR)	0.033	Decreasing	Significant
10	LOCHS (BWR) - Loss of Condensed Heat Sink (BWR)	0.775	--	
11	TRANS (BWR) - Transients (BWR)	0.108	--	
12	LOIA (PWR) - Loss of Instrument Air (PWR)	0.785	--	
13	SGTR (PWR) - Steam Generator Tube Rupture (PWR)	1.000	--	
14	SORV (PWR) - Stuck Open Relief Valve (PWR)	1.000	--	
15	LOCHS (PWR) - Loss of Condenser Heat Sink (PWR)	0.327	--	
16	TRANS (PWR) - Transients (PWR)	0.006	Decreasing	Significant

5 SYSTEM STUDIES

The system performance study including trending analysis is now performed every other year. There was no system trending analysis for 2017. A summary of the latest system trending analysis results can be obtained from the Summary of Significant Trends for 2016 report, which used data from 2007 through 2016.