

Enclosure 2

Handouts discussed during the March 18, 2015 ROP WG Public Meeting

Exclusion of Low Risk Trains/Segments From Unavailability Monitoring

MSPI monitors URI and UAI for a rolling period of three years. NEI 99-02 section F 2.3.5 discusses Birnbaum importance as it relates the exclusion of some valves and circuit breakers from the requirement to monitor those components for failures. For

$$B = CDF*[FV/UR]_{max}$$

If the Birnbaum importance (B) of a component (adjusted for Common Cause failure and Initiating Event frequency) is less than 1.0E-06, it may be excluded from the requirement to monitor for failures.

Currently, in NEI 99-02, there is no similar exclusion for monitoring the unavailability of trains or segments that have a low Birnbaum importance. In a three year period, there are 26,280 hours. Throughout the industry, it is not unusual to see trains or segments that can incur tens, if not hundreds of thousands of unavailability hours and remain Green. This means that they could be unavailable over the entire monitoring period and not make the indicator go white. Similar to monitored components, one can calculate the Birnbaum importance of individual trains or segments:

$$B = CDF*[FV_{UAP}/UAP]_{max}$$

Where FV_{UAP} is a Basic Event in the PRA model and UAP is the Basic Event probability adjusted for Initiating Event frequency, if applicable.

The following was calculated from a plant's data. The plant name and names of the segments have been changed:

<i>Plant X Cooling Water Unavailability</i>							
Segment	Segment _A	Segment _B	Segment _C	Loop B	Loop A	Train B	Train A
CDF	1.07E-05	1.07E-05	1.07E-05	1.07E-05	1.07E-05	1.07E-05	1.07E-05
FV_{UAP}	2.13E-03	9.54E-04	1.42E-03	3.62E-03	2.61E-03	1.98E-02	1.69E-02
UAP	1.18E-02	1.07E-02	1.18E-02	7.32E-04	7.32E-04	2.59E-03	2.59E-03
Birnbaum	1.93E-06	9.54E-07	1.29E-06	5.29E-05	3.82E-05	8.18E-05	6.98E-05
Hours to White	14,240	29,120	21,360	519	720	355	407

The hours to White in this table came from the plant's MSPI Margin report. This indicates that the hours to remain Green reaches the three year total of 26,280 when the Birnbaum importance is approximately 1E-06. Since the impact of the train or segment unavailability is added to other trains and URI to calculate MSPI, the impact of a train with a Birnbaum of 1E-06 can't be ignored. Industry recommends that any train or segment that has a Birnbaum of < 1E-07 be excluded from the requirement to monitor for unavailability.