

## ENCLOSURE 2

M180061

TRACG Biases, Uncertainties and Statistical Adders

Non-Proprietary Information – Class I (Public)

### **IMPORTANT NOTICE**

This is a non-proprietary version of Enclosure 1 to M180061, which has the proprietary information removed. Portions of the document that have been removed are indicated by an open and closed bracket as shown here [[ ]].

**TRACG Biases, Uncertainties and Statistical Adders**

BWR category or plant specific statistical adders may be used in accordance with the approved methodology, NEDC-32906P Supplement 3-A: *Migration to TRACG04 / PANAC11 from TRACG02 / PANAC10 for TRACG AOO and ATWS Overpressure Transients*, Revision 1, April 2010. As statistical adders are generated, they will be provided to the NRC for information.

The following tables provide the biases, uncertainties, and pressure adders to be applied to several plants using GE14 or GNF2 fuel when transient analyses are performed with TRACG methods for licensing applications. The biases and uncertainties are used to determine the minimum critical power ratio (MCPR) operating limit (OLMCPR). Statistical analyses were performed for all transients listed and a bounding value was selected and applied to all transients for each plant.

Plant Type / Plant	Fuel	Transient Event <sup>1</sup>	$\Delta$ CPR/ICPR Bias <sup>2</sup> (%)	$\Delta$ CPR/ICPR Uncertainty (%)	Notes
BWR/4 / Fermi	GE14	PRFDS	[[		
BWR/4 / Hatch 1 & 2	GNF2	PRFDS			
BWR/5 / Nine Mile Point 2	GNF2	FWCF			These statistics support the plant-specific Option B scram speed.
		LRNBP			
		TTNBP			
		PRFDS			
BWR/6 / River Bend	GNF2	FWCF			
		LRNBP			
		TTNBP			
		TTWBP			
		PRFDS		]]	

**Notes:**

- <sup>1</sup> FWCF = Feedwater Controller Failure  
LRNBP = Load Rejection with No Bypass  
TTNBP = Turbine Trip with No Bypass  
TTWBP = Turbine Trip with Bypass  
PRFDS = Pressure Regulator Failure – Downscale
- <sup>2</sup> CPR = Critical Power Ratio  
ICPR = Initial Critical Power Ratio

The following table provides the peak vessel pressure adder to be applied when transient analyses are performed with TRACG methods for licensing applications. The adder is used to modify the limiting MSIVF case for comparison to the acceptance criterion. This will ensure at least a 95% probability with 95% confidence that the ASME vessel overpressure limit will be met.

<b>Plant Type / Plant</b>	<b>Fuel</b>	<b>Transient Event<sup>3</sup></b>	<b>Peak Vessel Bottom Pressure Adder<sup>4</sup> (psi)</b>	<b>Notes</b>
BWR/4 / Peach Bottom 2 & 3	GNF2	MSIVF	[[	
BWR/6 / River Bend	GNF2	MSIVF	]]	

**Notes:**

- <sup>3</sup> MSIVF = Main Steam Isolation Valve Closure with Average Power Range Monitor (APRM) Flux Scram
- <sup>4</sup> One Sided Upper Tolerance Limit with 95% Content at a 95% Confidence Level (OSUTL95/95)