Entergy

Entergy Nuclear South
Entergy Operations, Inc.
17265 River Road
Killona, LA 70057
Tel 504-739-6310
Fax 504-739-6698
tmitch1@entergy.com

Timothy G. Mitchell
Director, Engineering
Waterford 3

W3F1-2004-0111

November 4, 2004

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Supplement to Amendment Request NPF-38-249,
Extended Power Uprate
Waterford Steam Electric Station, Unit 3
Docket No. 50-382
License No. NPF-38

REFERENCES:
1. Entergy Letter dated November 13, 2003, "License Amendment Request NPF-38-249 Extended Power Uprate"
2. Entergy Letter dated October 8, 2004, "Supplement to Amendment Request NPF-38-249 Extended Power Uprate"
3. NRC Letter dated October 29, 2004, "Waterford Steam Electric Station, Unit 3 (Waterford 3) – Request for Additional Information Related to Revision to Facility Operating License and Technical Specifications – Extended Power Uprate Request (TAC No. MC1355)"
4. Entergy Letter dated July 14, 2004, "Supplement to Amendment Request NPF-38-249 Extended Power Uprate"

Dear Sir or Madam:

By letter (Reference 1), Entergy Operations, Inc. (Entergy) proposed a change to the Waterford Steam Electric Station, Unit 3 (Waterford 3) Operating License and Technical Specifications to increase the unit's rated thermal power level from 3441 megawatts thermal (MWt) to 3716 MWt. Reference 1 included a proposed change to the Technical Specifications regarding the steam generator pressure – low setpoint based on Instrument Society of America (ISA) 67.04 Part 2 Method 3 methodology. The proposed change was supplemented (Reference 2) to update the allowable value.

By letter (Reference 3), the NRC staff issued a Request for Additional Information (RAI) which informed Entergy that the staff can no longer accept any requested Technical Specification (TS) changes that are based upon the use of Method 3 unless the method is modified to alleviate the staff concerns. In response to the RAI, to alleviate the staff's concern, Entergy has added 4 psi to the trip setpoint and allowable value that were previously submitted in Reference 3. Thus the revised trip setpoint is 666 psia and the revised allowable value is 652.4 psia. The steam generator pressure – low trip analytical limit of 576 psia used in the Extended Power Uprate safety analysis remains the same. Thus, the methodology used to develop the revised steam generator pressure – low setpoint and allowable value is based on

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a modification of Instrument Society of America (ISA) 67.04 Part 2 Method 3. The method utilized adds margin such that the difference between the allowable value and analytical limit exceeds the non-measurable loop uncertainty. Revised marked-up TS pages 2-3, 3/4 3-19, and 3/4 3-20 are provided in Attachment 1 and supersede those pages previously submitted. Revised marked-up TS Bases pages are provided for information only in Attachment 2 and supersede the equivalent Bases pages previously submitted. The bases for the acceptability of this revised setpoint methodology is provided in Attachment 3.

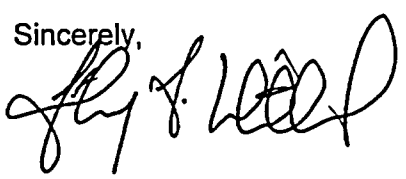
Entergy has followed the Method 3 issue closely and continues to maintain that Method 3 does not pose a significant safety issue. Entergy understands that the NRC staff will be addressing the Method 3 issue on a generic basis and looks forward to participating in the ultimate resolution to this industry issue.

The no significant hazards consideration included in Reference 4 is not affected by any information contained in this supplemental letter. There are no new commitments in this letter.

If you have any questions or require additional information, please contact D. Bryan Miller at 504-739-6692.

I declare under penalty of perjury that the foregoing is true and correct. Executed on November 4, 2004.

Sincerely,



TGM/DBM/cbh

Attachments:
1. Revised Markup of Technical Specification Pages
2. Revised Markup of Technical Specification Bases (For Information Only)
3. Bases for Acceptability of Revised Setpoint Methodology

cc: Dr. Bruce S. Mallett
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011

NRC Senior Resident Inspector
Waterford 3
P.O. Box 822
Killona, LA 70066-0751

U.S. Nuclear Regulatory Commission
Attn: Mr. Nageswaran Kalyanam MS O-7D1
Washington, DC 20555-0001

Wise, Carter, Child & Caraway
Attn: J. Smith
P.O. Box 651
Jackson, MS 39205

Winston & Strawn
Attn: N.S. Reynolds
1400 L Street, NW
Washington, DC 20005-3502

Louisiana Department of Environmental Quality
Office of Environmental Compliance
Surveillance Division
P. O. Box 4312
Baton Rouge, LA 70821-4312

American Nuclear Insurers
Attn: Library
Town Center Suite 300S
29th S. Main Street
West Hartford, CT 06107-2445

Attachment 1

To

W3F1-2004-0111

Revised Markup of Technical Specification Pages

TABLE 2.2-1
REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
1. Manual Reactor Trip	Not Applicable	Not Applicable
2. Linear Power Level - High		
Four Reactor Coolant Pumps Operating	≤ 108% of RATED THERMAL POWER	≤ 108.76% of RATED THERMAL POWER
3. Logarithmic Power Level - High (1)	≤ 0.257% of RATED THERMAL POWER (6)	≤ 0.280% of RATED THERMAL POWER (6)
4. Pressurizer Pressure - High	≤ 2350 psia	≤ 2359 psia
5. Pressurizer Pressure - Low	≥ 1684 psia (2)	≥ 1649.7 psia (2)
6. Containment Pressure - High	≤ 17.1 psia	≤ 17.4 psia
7. Steam Generator Pressure - Low	≥ ~~764~~ 666 psia (3)	≥ ~~748.0~~ 652.4 psia (3)
8. Steam Generator Level - Low	≥ 27.4% (4)	≥ 26.48% (4)
9. Local Power Density - High	≤ 21.0 kW/ft (5)	≤ 21.0 kW/ft (5)
10. DNBR - Low	≥ 1.26 (5)	≥ 1.26 (5)
11. Steam Generator Level - High	≤ 87.7% (4)	≤ 88.62% (4)
12. Reactor Protection System Logic	Not Applicable	Not Applicable
13. Reactor Trip Breakers	Not Applicable	Not Applicable
14. Core Protection Calculators	Not Applicable	Not Applicable
15. CEA Calculators	Not Applicable	Not Applicable
16. Reactor Coolant Flow - Low	≥ 19.00 psid (7)	≥ 18.47 psid (7)

~~TABLE 3.3-4~~

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
1. SAFETY INJECTION (SIAS)		
a. Manual (Trip Buttons)	Not Applicable	Not Applicable
b. Containment Pressure - High	≤ 17.1 psia	≤ 17.4 psia
c. Pressurizer Pressure - Low	≥ 1684 psia[1]	≥ 1649.7 psia[1]
d. Automatic Actuation Logic	Not Applicable	Not Applicable
2. CONTAINMENT SPRAY (CSAS)		
a. Manual (Trip Buttons)	Not Applicable	Not Applicable
b. Containment Pressure – High-High	≤ 17.7 psia	≤ 18.0 psia
c. Automatic Actuation Logic	Not Applicable	Not Applicable
3. CONTAINMENT ISOLATION (CIAS)		
a. Manual CIAS (Trip Buttons)	Not Applicable	Not Applicable
b. Containment Pressure - High	≤ 17.1 psia	≤ 17.4 psia
c. Pressurizer Pressure - Low	≥ 1684 psia[1]	≥ 1649.7 psia[1]
d. Automatic Actuation Logic	Not Applicable	Not Applicable
4. MAIN STEAM LINE ISOLATION		
a. Manual (Trip Buttons)	Not Applicable	Not Applicable
b. Steam Generator Pressure - Low	≥ ~~764~~ 666 psia[2]	≥ ~~749.9~~ 652.4 psia[2]
c. Containment Pressure - High	≤ 17.1 psia	≤ 17.4 psia
d. Automatic Actuation Logic	Not Applicable	Not Applicable

TABLE 3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP VALUE	ALLOWABLE VALUES
5. SAFETY INJECTION SYSTEM SUMP RECIRCULATION (RAS)		
a. Manual RAS (Trip Buttons)	Not Applicable	Not Applicable
b. Refueling Water Storage Pool - Low	10.0% (57,967 gallons)	9.08% (52,634 gallons)
c. Automatic Actuation Logic	Not Applicable	Not Applicable
6. LOSS OF POWER		
a. 4.16 kV Emergency Bus Undervoltage (Loss of Voltage)	≥ 3245 volts	≥ 3245 volts
b. 480 V Emergency Bus Undervoltage	≥ 372 volts	≥ 354 volts
c. 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)	≥ 3875 volts	≥ 3860 volts
7. EMERGENCY FEEDWATER (EFAS)		
a. Manual (Trip Buttons)	Not Applicable	Not Applicable
b. Steam Generator (1&2) Level - Low	≥ 27.4%[3] [4]	≥ 26.48%[3] [4]
c. Steam Generator ΔP - High (SG-1 > SG-2)	≤ 123 psid	≤ 134 psid
d. Steam Generator ΔP - High (SG-2 > SG-1)	≤ 123 psid 666	≤ 134 psid 652.4
e. Steam Generator (1&2) Pressure - Low	≥ ~~764~~ psia[2]	≥ ~~749.9~~ psia[2]
f. Automatic Actuation Logic	Not Applicable	Not Applicable
g. Control Valve Logic (Wide Range SG Level - Low)	≥ 36.3%[3] [5]	≥ 35.3%[3] [5]

Attachment 2

To

W3F1-2004-0111

Revised Markup of Technical Specification Bases (For Information Only)

New TS Bases

TABLE B 3/4.0-1
ANALYTICAL-INDICATED VALUES

TS	Parameter	Analytical Value	Indicated / Plant Value	Comments
1.24	RATED THERMAL POWER	3735 MWt	3716 MWt	
Table 2.2-1	#2 Linear Power Level High	115%	≤108%	
Table 2.2-1	#3 Logarithmic Power Level High	4.4%	≤0.257%	
Table 2.2-1	#4 Pressurizer Pressure High	2422 psia	≤2350 psia	
Table 2.2-1	#5 Pressurizer Pressure Low	1560 psia	≥1684 psia	
Table 2.2-1	#6 Containment Pressure High	19.7 psia	≤17.1 psia	
Table 2.2-1	#7 Steam Generator Pressure Low	576 psia	≥666 psia	
Table 2.2-1	#8 Steam Generator Level Low	5%NR	≥27.4%NR	
Table 2.2-1	#9 Local Power Density High	21kW/ft	≤21kW/ft	
Table 2.2-1	#10 DNBR Low	1.26	≥1.26	
Table 2.2-1	#11 Steam Generator Level High	90% (NR)	≤87.7% (NR)	
Table 2.2-1	#16 Reactor Coolant Flow Low	60% flow	≥19.00 psid	Analysis utilizes units in % flow while indications are in psid
3.1.2.7	BAMT Boron Concentration	≥4551 ppm ≤6187 ppm	≥4900 ppm ≤6125 ppm	
3.1.2.7	RWSP Volume	NA	≥12% level	Modes 5 & 6
3.1.2.7	RWSP Boron Concentration	2029 ppm	≥2050 ppm	
4.1.2.7	RAB Air Temperature	50°F	≥55°F	
4.1.2.7	BAMT Solution Temperature	49°F	≥60°F	
4.1.2.8	RAB Air Temperature	≥50°F	≥55°F	
4.1.2.8	BAMT Solution Temperature	49°F	≥ 60°F	

New TS Bases

TABLE B 3/4.0-1
ANALYTICAL-INDICATED VALUES

TS	Parameter	Analytical Value	Indicated / Plant Value	Comments
3.2.6	RCS Cold Leg Temperature	≥533°F ≤552°F	≥536°F ≤549°F	
3.2.8	Pressurizer Pressure	≥2090 psia ≤2310 psia	≥2125 psia ≤2275 psia	
Table 3.3-4	#1.b, 3.b & 4.c Containment Pressure High	19.7 psia	≤17.1 psia	
Table 3.3-4	#1.c & 3.c Pressurizer Pressure Low	1560 psia	≥1684 psia	@ NOP
Table 3.3-4	#2.b Containment Pressure High High	19.7 psia	≤17.7 psia	
Table 3.3-4	#4.b & 7.e Steam Generator Pressure Low	576 psia	≥666 psia	@NOP
Table 3.3-4	#5.b RWSP Level for RAS	28,843 gal.	≥10% level	Analysis utilizes units in gallons while indications are in %.
Table 3.3-4	#6.a 4.16 kV 1E Bus Undervoltage (Loss of Voltage)	3245 volts	≥3245 volts	
Table 3.3-4	#6.b 480 V 1E Bus Undervoltage	354 volts	≥372 volts	
Table 3.3-4	#6.c 4.16 kV 1E Bus Undervoltage (Degraded Voltage)	3860 volts	≥3875 volts	
Table 3.3-4	#7.b Steam Generator Level Low	5% (NR)	≥27.4% (NR)	
Table 3.3-4	#7.c & 7.d Steam Generator Delta Pressure High	230 psid	≤123 psid	
Table 3.3-4	#7.g Control Valve Logic (WR SG Level Low)	21.3% level	≥36.3% level	
3.4.5.2c	Primary – Secondary Leakage	75 gpd	≤75 gpd	per SG

Attachment 3

To

W3F1-2004-0111

Bases for Acceptability of Revised Setpoint Methodology

Bases for Acceptability of Revised Setpoint Methodology

The NRC staff requested, in a letter dated October 29, 2004, "Waterford Steam Electric Station, Unit 3 (Waterford 3) – Request for Additional Information Related to Revision to Facility Operating License and Technical Specifications – Extended Power Uprate Request (TAC No. MC1355)," that Entergy Operations, Inc. (Entergy) consider the following examples of acceptable actions regarding the Waterford Steam Electric Station, Unit 3 (Waterford 3) Extended Power Uprate (EPU) license amendment request:

1. Demonstrate that the approach used to develop the proposed limits provides adequate assurance that the plant will operate in accordance with the safety analyses. Show that Operability is ensured in the Technical Specifications (TS).
2. Suspend consideration of setpoint-related aspects of your request pending generic resolution of the staff concern.
3. Revise your request to incorporate Method 1, Method 2, or Performance-Based TS.
4. Revise your request to incorporate some other approach that you demonstrate to provide adequate confidence that the plant will operate in accordance with the safety analyses and show that Operability is ensured in the TSs.

The proposed "steam generator pressure- low" trip setpoint and allowable value have been derived using a method consistent with action 4 above. Waterford 3 historically has added margin to the total loop uncertainty (TLU) to establish a conservative trip setpoint to provide assurance with more than adequate confidence the plant would operate in accordance with the safety analyses. Additionally, the calculated allowable value (AV) was the acceptance criterion used to confirm the measurable portions of the channel functioned within statistical predictions, thus assuring the analytical limit would be protected by the trip setpoint. However, to address the NRC Staff concerns with Instrument Society of America (ISA) 67.04 Method 3 (Method 3), Waterford 3 has revised the trip setpoint and allowable value to add 4 psi more margin. With this change, the AV derived by deducting the periodic test error (PTE) from the trip setpoint will be greater than the analytical limit plus non-measurable error effects. The non-measurable error effects include both the 95/95 error effects plus the applicable non-random biases. The proposed values will continue to assure that the plant will operate in accordance with the safety analyses and that operability is ensured in the TSs.

The addition of 4 psi margin to the steam generator pressure - low trip setpoint total loop uncertainty preserves the methodology for the derivation of setpoints and allowable values as described in the Waterford 3 current licensing basis. This assures consistency between this trip setpoint and other trip setpoints within the current licensing basis. Additionally, the additional 4 psi of margin ensures that the difference between the steam generator pressure - low allowable value and analytical limit exceeds the non-measurable loop uncertainty.

A simple check calculation is provided below.

Simple Check Calculation

Proposed Trip setpoint:	**666 psia**
Periodic test error (PTE):	-13.6 psi
Proposed allowable value: (Trip setpoint – PTE)	**652.4 psia**

Analytical limit (AL):	576 psia
Non-measurable uncertainties + bias:	+76.1 psi
AL + Non-measurable uncertainty:	**652.1 psia**

Thus, the proposed trip setpoint less the PTE is greater than AL plus the non-measurable uncertainties. Entergy believes this addresses the staff's interpretation that the AV protect the analytical limit with greater than 95% probability and with 95% confidence.

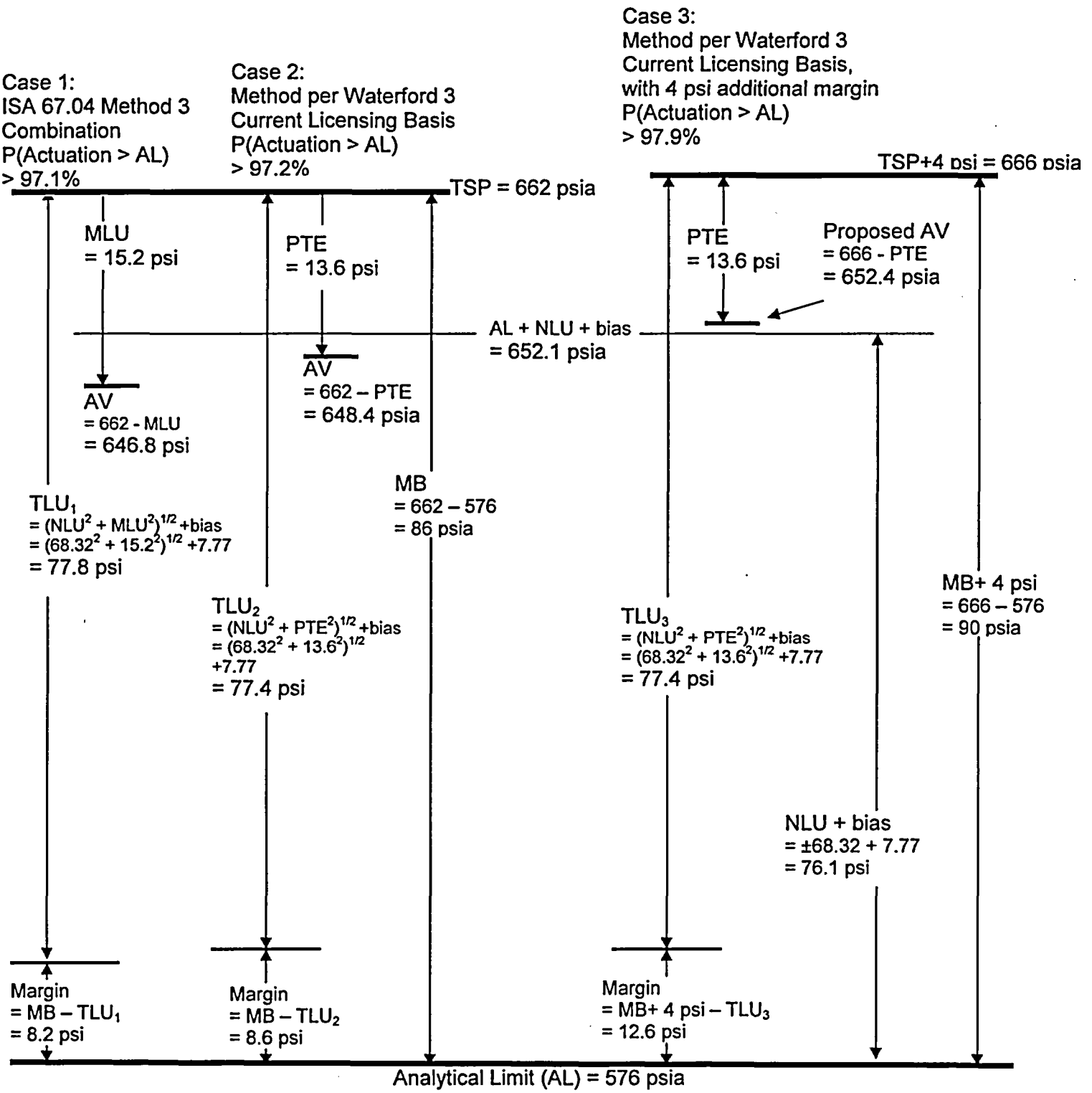
An illustration, provided below, reflects the previously proposed trip setpoint, revised setpoint, and AV as derived using three different methods:

- by ISA 67.04 Method 3,
- the Waterford 3 current licensing basis (similar to Method 3), and
- Waterford 3 current licensing basis plus 4 psi.

The staff has indicated that setpoint AVs established by means of Method 3 do not provide adequate assurance that a plant will operate in accordance with the assumptions upon which the plant safety analyses have been based.

Waterford 3 respectfully maintains its position that the trip setpoint and allowable value using Method 3 does provide adequate assurance the plant will operate in accordance with the plant safety analyses. This is demonstrated in the illustration below which includes the probability that the trip will occur at a value greater than the analytical limit for this parameter for each method. Maintaining the proposed trip setpoint as the limiting safety system setting (LSSS) derived and maintained in accordance with Waterford 3 TS assures with greater than 95/95 confidence the analytical limit will be protected. The allowable value as currently listed in Waterford 3 TS is used to determine that plant protection system trip modules perform as statistically predicted to assure the trip setpoint (i.e., LSSS) protects the AL.

The figure below illustrates the relationship between the proposed trip setpoint, new proposed setpoint, AV and AL, based on three calculation methods. NLU is the combination of the random portion of the non-measurable loop uncertainty effects. MLU is the combination of the random portion of the measurable effects, combined as they would be combined for the derivation of the TLU used to determine the trip setpoint.



The terms used in the figure above are defined below:

AL Analytical Limit
AV Allowable Value
MB Measurement Band; difference between the trip setpoint and AL
MLU Measurable Loop Uncertainty, the combination of the random portion of the measurable effects, combined as they would be combined for the derivation of the TLU used to determine the trip setpoint.
NLU Non-measurable Loop Uncertainty (also known as nCOT), the combination of the random portion of the non-measurable loop uncertainty effects
PTE Periodic Test Error, the combination of the random portion of the measurable effects, combined as they would be combined in accordance Waterford 3 Technical Specifications for the derivation of the AV.
TLU Total Loop Uncertainty, the combination the non-measurable random effects, measurable random effects, and biases
TSP Trip Setpoint (i.e., LSSS at Waterford 3)