



LOUISIANA
POWER & LIGHT

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April 19, 1984

W3P84-1114
3-A1.01.04
3-B1

Director of Nuclear Reactor Regulation
Attention: Mr. G.W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing
Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Waterford SES Unit No. 3
Docket No. 50-382
Containment Pressure Trip Setpoint

REFERENCE: W3P84-0615, dated March 12, 1984

Dear Sir:

Item II.E.4.2 of NUREG 0737 requires the development of a containment pressure setpoint at which containment isolation is initiated. The referenced letter transmitted the setpoint calculation methodology and the resultant setpoint of 17.1 psia. Per the request of the Containment Systems Branch, please find attached a copy of the subject calculation.

We trust that the attachment is enough to close out this concern in the next supplement to the Waterford 3 SER. Should you have any questions or comments on this matter, please do not hesitate to contact us.

Yours very truly,



K.W. Cook

Nuclear Support & Licensing Manager

KWC/WW/MJM/pco

Enclosure

cc: W.M. Stevenson, E.L. Blake, J. Wilson, J. Huang, D. Hoffman,
G.L. Constable, J.T. Collins, D.M. Crutchfield

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CALCULATION OF HIGH CONTAINMENT PRESSURE TRIP

I. ANALYSIS VALUES

(REFERENCE)

A. Analysis Setpoint (1):	5.0 psig	(5.04)
B. RPS Analysis Delay Time (1):	2.0 Sec.	(5.04)
C. Signal Response Time:	0.4 Sec.	(5.05)
D. Coil Decay Time:	0.3 Sec.	(5.05)
E. ESFAS Analysis Delay Time:	1.0 Sec.	(5.32)

TOTAL ANALYSIS RESPONSE TIME

B = 2.0 Seconds

B - D = 1.7 Seconds (For RPS Tech Spec Use)

E = 1.0 Second (For ESFAS Tech Spec Use)

II. PPS CABINET UNCERTAINTIES

(REFERENCE)

Instrument Range:	0 to 30 psia	(5.14)
Voltage Range:	1 to 5 Volts	(5.11)
Conversion Factor:	7.5 psia/Volt	

A. Calibration Unc. (2):	+/- 0.038 psi	(3.2)
B. Bistable Drift (3):	+/- 0.068 psi	(5.11)
C. Worst Case Unc. (4):	+/- 0.210 psi	(5.11)

PERIODIC TEST ERROR

$$\begin{aligned}\text{RSS (A,A,B,C)} &= \pm 0.227 \text{ psi} \\ &= \pm 0.2 \text{ psi}\end{aligned}$$

MAXIMUM OPERATIONAL ERROR

$$\text{RSS (A,B,C)} = \pm 0.224 \text{ psi}$$

III. PROCESS EQUIPMENT UNCERTAINTIES

(REFERENCE)

D. Rosemount PT Accuracy:	+/- 0.075 psi	(5.14)
E. Westinghouse PY Accuracy:	+/- 0.01 psi	(5.14)
F. Cal. Equip. Unc. (5):	+/- 0.019 psi	(3.3)
G. Amb. Temp. Effect:	+/- 0.27 psi	(5.14)
H. Long Term Drift (6):	+/- 0.85 psi	(5.14)
I. Radiation Effect (6)	+/- 1.0 psi	(5.14)
J. Worst Case Normal Error:	+/- 0.93 psi	(5.14)
K. Seismic Error:	+/- 0.5 psi	(5.14)
L. Worst Case MSLB Error:	+ 2.1 psi	(5.14)
M. Worst Case LOCA Error:	+ 0.64 psi	(5.14)

PROCESS EQUIPMENT UNCERTAINTIES (Continued)

CALIBRATION ERROR

$$\text{RSS (D,E)} = \pm 0.075 \text{ psi}$$

PERIODIC TEST ERROR

$$\begin{aligned} \text{RSS (D,E,F,F,G,H,I)} &= \pm 1.342 \text{ psi} \\ &= \pm 1.4 \text{ psi} \end{aligned}$$

WORST CASE NORMAL (NON-ACCIDENT) ERROR W/SEISMIC (7)

$$\text{RSS (D,E,F,H,I,J,K)} = \pm 1.686 \text{ psi}$$

WORST CASE MSLB ERROR

$$\begin{aligned} \text{RSS (D,E,F,H,I,J,K)} + L' &= \pm 1.686 + 2.1 \text{ psi} \\ &\quad - 0.0 \text{ psi} \end{aligned}$$

REFERENCE PRESSURE EXCURSION LIMITS

- A. High Atmospheric Press. Excursion: + 0.3 psi (5.38)
- B. Low Atmospheric Press. Excursion: - 0.3 psi (3.9)
- C. High Containment Press. Limit: + 0.2 psig (5.39)
- D. Low Containment Press. Limit: 0.0 psig (3.10)
- E. High Containment Press. Excursion: + 0.5 psig (5.38)

V. TOTAL CHANNEL WORST CASE NORMAL ERROR W/SEISMIC (7)

COMBINE:

- A. PPS Cabinet Max. Op. Error: $\pm 0.224 \text{ psi}$
- B. PE Worst Case Normal Error: $\pm 1.686 \text{ psi}$

$$\begin{aligned} \text{RSS (A,B)} &= \pm 1.701 \text{ psi} \\ &= \pm 1.7 \text{ psi} \end{aligned}$$

VI. TOTAL CHANNEL ACCIDENT ERROR

COMBINE:

- A. PPS Cabinet Max. Op. Error: $\pm 0.224 \text{ psi}$
- B. Worst Case MSLB Error: $\pm 1.686 + 2.1 \text{ psi}$

$$\begin{aligned} \text{RSS (A,B)} + B' &= \pm 1.701 + 2.1 \text{ psi} \\ &\quad - 0.0 \text{ psi} \end{aligned}$$

$$\begin{aligned} &= + 3.8 \text{ psi} \\ &= - 1.7 \text{ psi} \end{aligned}$$

CALCULATION NOTES:

1. The setpoint is bracketed by two methods:
 - (A) Starting from 0.0 psig, the lowest possible value is calculated which would not interfere with operation unnecessarily. (Ref. 5.38)
 - (B) Starting from 5.0 psig, the highest possible value is calculated which will guarantee a reactor trip when required. This value is needed by the loss of coolant accident.
2. Based on an assumed calibration accuracy of ± 0.005 volts and a conversion factor of 7.5 psia per volt.
3. For a 39-day period. Based on a maximum expected drift of ± 0.007 volts over 30 days, extrapolated linearly to ± 0.009 volts for 39 days, and a conversion factor of 7.5 psi per volt.
4. Maximum error according to PPS cabinet specification.
5. Obtained from $RSS (D,E)/4.0$ in accordance with assumption 3.3.
6. For a 22.5 month period.
7. All equipment is required to function during a seismic event.