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F. L. CLAYTON, JR. Senior Vice President



January 22, 1980

Docket Nos. 50-348 and 50-364

Mr. D. F. Ross, Jr., Acting Director Division of Project Management Office of Nuclear Reactor Regulation U. S. Nuclear Regulatory Commission Washington, D.C. 20555

Dear Mr. Ross:

As requested in your letter dated December 27, 1979 concerning Modifications of Small-Break Loss-Of-Coolant Accident Operator Guidelines, Alabama Power Company submits the enclosed response.

If you have any further questions in this matter, please advise.

Yours very truly,

F. L. Clayton, Jr.

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Enclosure

cc: Mr. R. A. Thomas Mr. G. F. Trowbridge

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LNCLOSURE

Emergency Operating Procedures have been revised to incorporate the requirement for ensuring at least a 43°F subcooling margin (normal full power subcooling) before terminating safety injection. This is in accordance with the Small-Break Loss-of-Coolant Accident Operator Guidelines approved by NRC by your letter to Mr. Cordell Reed, dated November 5, 1979.

Currently, the non-LOCA transients and EOI's are being reviewed for the purposes of incorporating a subcooling criterion in the HPI termination criteria. These activities will be completed and transmitted to the NRC by the Owner's Group chairman within the 21 day requirement.

Derivation of instrument crors associated with measurement of RCS pressure and temperature for ensuring adequate core subcooling is given below.

Pressure

RCS wide range pressure is measured by ITT Barton, Model 763 pressure transmitters. Qualification of the transmitters are documented in the Westinghouse document entitled "Qualification Testing of Barton Pressure and Differential Pressure Transmitters" transmitted to Mr. J. F. Stolz on September 29, 1978. The following describes errors in indicated pressure as a result of normal and post-accident environment:

NOTE: Wide range span - 0-3000 psig

Normal transmitter reference accuracy ¹	= +0.5% of span = ±15 psi
Ambient temperature effects on trans- mitter ²	= +0.5% of span = ±15 psi
Maximum transmitter $drift^2$	= <u>+1.0%</u> of span = <u>±30 psi</u>
Normal instrument accuracy ²	= <u>+0.5%</u> of span = <u>±15 psi</u>
Ambient temperature effect on instrument ²	= <u>+0.5%</u> of span = <u>±15 psi</u>
Maximum instrument drift ²	= <u>+1.0%</u> of span = <u>±30 psi</u>
Normal indicator accuracy ³	= <u>+</u> 1.5% of span = <u>±</u> 45 psi
Calibration devices accuracy ⁴	= $\pm 0.1\%$ of scale = ± 3 psi

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Allowed calibration tolerances ⁵	= <u>+</u> 0.5% of span = <u>±15 psi</u>
Maximum indicator reading error ⁶	= $\frac{1}{4}$ c smallest division = $\frac{1}{2}$ of 50 psi = ± 12.5 psi
Maximum Normal Error	$= \pm \sqrt{5(15)^2 + 2(30)^2 + (45)^2 + (12.5)^2}$ $= \pm 71.5 \text{ psi}$
Maximum post-accident environmental effect ⁷ (160°F and 8 psig steam)	= $\pm 2\%$ of span = ± 60 psi

Total indicated error = ± 132 psig

Temperature

RCS wide range temperature is measured by Rosemount Model 176RS RTDs. Qualification of these RTDs are documented in Westinghouse WCAP 9157. The following describes errors in indicated temperature as a result of normal environment. Post-accident environmental effects are negligible.

NOTE: Span - 0-700°F	
Process measurement error ²	= ±3.0% of span = ±21°F
Normal instrument error ²	= ±0.5% of span = ±3.5°F
Ambient temperature effect on instrument ²	= ±0.5% of span = ±3.5°F
Maximum instrument drift ²	= ±1.0% of span = ±7.0°F
Normal indicator accuracy ³	= ±0.5% of span = ±3.5°F
Calibration curve accuracy ²	$= \pm 0.2^{\circ}F$
Accuracy of calibration devices 4	= ±0.01% of span = ±.07°F
Allowed calibration accuracy ⁵	= ±0.1% of span = ±0.7°F
Calibration error due to non-linearity 2	= ±0.5% of span = ±3.5°F

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Maximum indicator reading error⁶

= ½ of smallest division

= ½ of 10°F

= ±2.50F

$$= \pm \sqrt{4(3.5)^2 + (2.5)^2 + (21)^2 + (7)^2 + (.2)^2 + (.7)^2 + (.07)^2}$$

 $= \pm 23.4^{\circ}F$

NOTES

Maximum Error

- (1) ITT Barton Model 763 technical manual.
- (2) Dick Miller, Engineer Westinghouse I&C
- (3) Westinghouse Process Instrumentation Accuracy Requirements and Guidelines
- (4) FNP Test Equipment Inventory Description
- (5) Applicable Surveillance Test Procedures (FNP)
- (6) Main Control Board Instrumentation
- (7) Westinghouse Report "Qualification Testing of Barton Pressure and Differential Pressure Transmitters" (Submitted to NRC 9/29/78 by letter from T. M. Anderson to J. F. Stolz) extrapolated to 160°F and 8 psig per Dick Miller, Westinghouse I&C.

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