

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD

In The Matter of	:	
	:	
Georgia Power Company,	:	
et al.	:	
	:	
(Vogtle Electric	:	DOCKET NO. 50-424-OLA
Generating Plant,	:	50-425-OLA
Units 1 and 2)	:	
	:	ASLB1 WJ. 90-617-03-OLA

AFFIDAVIT OF LEWIS WARD
IN SUPPORT OF APPLICANTS' RESPONSE TO
THE BOARD'S MEMORANDUM AND ORDER OF JANUARY 22, 1991

I, Lewis Ward, having first been duly sworn, hereby depose and state as follows:

1. I am employed by Southern Nuclear Operating Company as Manager, Nuclear Maintenance and Support - Vogtle. My office is located in Birmingham, Alabama.

2. I previously provided an Affidavit listed as Exhibit 8 to "Georgia Power Company's Supplemental Statement Concerning Matters Raised By The Board During The Pre-Hearing Conference" which was filed with the Nuclear Regulatory Commission Atomic Safety and Licensing Board on or about November 14, 1990. This affidavit is submitted in connection with Georgia Power's Response To The Board's Memorandum And Order Of January 22, 1991.

3. This Board, in its January 22, 1991 Memorandum and Order, posed the following questions under question number 4:

How is the calibration of the Calgon [sic] sensors locked into place? Why does the calibration drift?

4. In order to understand the answer to the above questions, it is helpful to understand the operation of the Calgon Temperature Sensor Model A3500-W3 which is used to sense the jacket water temperature. Attachment A to this Affidavit depicts one of these sensors, with the metal "thermowell" around the sensor disk probe removed. As shown on Attachment A, a calibration ring surrounds the poppet disk. The poppet disk has a radial pin which fits into a vertical slot in the calibration disk, which allows the poppet disk to move freely in the vertical direction (thus trip or reset) but not to rotate unless the calibration disk also rotates. The poppet disk is finely threaded onto a disk shaft. Rotating the calibration ring clockwise or counter clockwise also turns the poppet disk on the non-rotating disk shaft. Turning the calibration ring, then, varies slightly the length of the disk shaft from the bottom of the poppet disk to the tip of the shaft (below the sensor disks in the diagram).*

* The same rotation varies the distance from the bottom of the poppet disk to the base gasket at the poppet.

Calibration of the sensor involves the setting of the disk shaft length relative to the chosen setpoint so that, once the setpoint is reached, the "poppet" is pushed by the poppet disk downward and vents the air, which is under pressure, out the vent port. This venting is the actuation of the protective trip (e.g. two venting HJWT sensors during surveillance testing would trip the diesel generator).

The portion of the sensor below the "base" in the diagram is, as installed in the diesel generator, located in a metal "thermowell". The well surrounds the spacer tube and sensor disks, which can be viewed as the "probe" of the sensor.

5. Again, in order to calibrate the Calcon temperature sensor, the calibration ring in the sensor is rotated. The calibration ring is "locked" into place by an o-ring located between the calibration disk and the body of the sensor. This o-ring provides an airtight joint to prevent air leakage around the outside of the calibration ring and, due to its tight fit, prevents the calibration ring from unintentionally rotating.

6. Variation between the calibrated setpoint of a Calcon sensor and an activation value as detected by an installed sensor could result from a number of factors. Historically, air leakage and internal contamination of new and installed sensors were determined to result in variation of 30°F or

more. See, specifically, Attachment B to Exhibit 8 of the Applicants' Supplemental Statement of November 14, 1990, page II-3 and II-4 of Wyle Laboratories Test Report No. 17133-1. Variation of lesser amounts might have resulted from calibration methodology, including temperature stabilization prior to calibration, contamination on the sensor disks (in the form of slight calcium coating if the sensor is immersed directly into aqueous calibration bath), minor variation associated with calibration equipment (sensor vis-a-vis water bath thermocouple), water bath heat-up rate, and looseness of set-screws of the thermowell which surrounds the probe. Id., pages I-4 and I-5 of Test Report No. 17133-1. These sources of variation associated with calibration methodology have been addressed adequately in revised procedures and instrumentation training so as to minimize the possibility of significant calibration errors. Attachment C to Exhibit 8 of the Applicants' Supplemental Statement, VEGP Procedure 22981-C. Additionally, the actuation setpoint of an installed sensor can change over time (this is commonly referred to as setpoint "drift"). Any factor that affects the point at which the poppet valve vents the air changes the setpoint (e.g., contamination on sensor disks, relaxation of sensor tension spring or the poppet spring, foreign material, air leaks and looseness of the spacer tube). These changes,

although small, are the reason that the sensors are periodically removed to check their calibration, thereby providing adequate assurance of the appropriate setpoint actuation.

7. The facts contained in this Affidavit are true and correct and based upon my personal knowledge.

Lewis Ward

Lewis Ward

Sworn to and subscribed
before me this 7 day
of March, 1991.

Linger Carter
Notary Public

MY COMMISSION EXPIRES JANUARY 12, 1993

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CALCON TEMPERATURE SENSOR MODEL A3500-W3

