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practice to only use a fitting one time. A new sensor would receive a new fitting; the old fittings are not reused.

The metal shavings or splinters appeared to be originating from the air supply port screw threads of the sensor. It appears that the shavings (called thread spalls) are either dislodged from the screw threads or are created upon insertion of the Swage-Lock fitting. The Swage-Lock fitting is made of stainless steal, which is a harder material than the aluminum sensor body. Inserting the Swage-Lock fitting could be carving spalls from the sensor threads as it is being inserted.

Conclusion

Based on the results of the testing performed, the licensee believes the primary cause for the trips of emergency diesel generator 1A during the incident was improper intermittent operation of the Calcon jacket water temperature sensors. Intermittent operation appears to have been caused by the presence of foreign material (i.e., pipe thread sealant and thread spalls) that affected sensor internal moving parts. Premature venting of the sensor air supply lines can cause the engine control logic to sense a false high temperature trip condition and to automatically trip the emergency diesel generator. Contributing causes appear to include the effects of multiple leaks existing in the pneumatic engine control system, and sensor calibration techniques that may have resulted in lower setpoint values.

May 27 Trip

The licensee has experienced additional problems with Calcon pneumatic temperature sensors subsequent to the testing at Wyle. Specifically, emergency diesel generator 1B unexpectedly tripped on high jacket water temperature during testing. The Vogtle I&C shop had calibrated the sensors to trip at 200 $\pm$ 4 °F, but subsequent testing at Wyle found the setpoints to be between 160 °F and 165 °F. The licensee's preliminary investigation indicates that the relative locations of the reference temperature element and the sensor to the bath heater, and the circulating capability of the bath during sensor calibration, may have contributed to the lower setpoints. The licensee's troubleshooting efforts are continuing.

Subsequent to the Team's investigation, the lube oil pressure sensor (IPSL-4749A) that would not reset during post-incident calibration, and which may have been venting during the incident, was inspected and tested by the diesel generator supplier (Cooper Industries, formerly IMO Delaval Inc.). The sensor diaphragm was found to be pushed up against and sticking to the sensor's process pressure sensing port by the spring and pressure plate assembly on the sensor side of the diaphragm. This significantly reduced the cross-sectional area of the diaphragm exposed to process pressure, and a greater process pressure is required to unstick the diaphragm. The diaphragm did not break loose during testing until pressure was increased to 118 psi. Normal lube oil pressure when the engine is operating is approximately 55 psi. The sticking is a consequence of "tolerance stack-up" as discussed in an addendum dated May 12, 1988 to a 10 CFR Part 21 report from IMO Delaval Inc. to NRC.

The intent of the Part 21 addendum was to have the affected Calcon Model B4400 pressure sensors (that could not be verified to not have the problem) returned for remachining,

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NUCLEAR REGULATORY COMMISSION

50-424-OLA-3
Docket No 50-425-OLA-3 Official Exh. No. Int. II-138
In the matter of Ga. Power Co.

Staff		IDENTIFIED	/
Applicant		RECEIVED	/
Intervenor	/	REJECTED	
Contng Offr			
Contractor		DATE	5-31-95
Other		Witness	M. Horton
Reporter	WLW		