

ROOT CAUSE - 1A Diesel Shutdown

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'95 OCT 20 P4:43

The team believes that the 1A diesel tripped because of a combination of an intermittent failure of a jacket water temperature switch and/or inconsistent calibration techniques of these switches during 1R2. Subsequent testing has shown that the 3/20/90 diesel annunciator indication could be reproduced on a high jacket water trip. The jacket water trip switches have proven reliable on these and similar engines between overhauls.

Key Lesson Learned and Recommendations

1. Calibration procedures should be reviewed with the vendor to ensure that calibrations are consistent, and switch performance is reliable.
2. Operator training should be revised to ensure that operators realize that an emergency reset will override the high jacket water trip.
3. Maintenance procedures should be revised to ensure that post overhaul control air leaks meet acceptance standards (bubble test performed).
4. The undervoltage start of the diesel should be changed to bypass non-essential engine trips to improve overall reliability.

Diesel Reliability

In 1989 Vogtle diesels have been more reliable than other nuclear industry diesels.

Safety System Performance (Emergency AC Power -- BWR & PWR)

	<u>1987</u>	<u>1988</u>	<u>1989</u>
US BQ	0.010	0.009	0.012
US MEDIAN	0.017	0.017	0.020
SISTERS	0.027	0.033	0.030
VOGTLE U1	0.04	0.05	0.006
VOGTLE U2			0.006

PLAINTIFFS  
EXHIBIT  
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NUCLEAR REGULATORY COMMISSION

Docket No. 50-424/425-OLA-3 EXHIBIT NO. II-89

In the matter of Georgia Power Co. et al., Vogtle Units 1 & 2

Staff  Applicant  Intervenor  Other

Identified  Received  Rejected Reporter SD

Date 9/15/95 Witness G. BOCKHOLD

32 PROJECT  
046040

## UNIT ONE D/G TRIP SENSOR HISTORY (SUMMARY)

MWO #	DATE	D/G	SENSOR	COMMENTS
18624684	12/22/86	1A	LO Turbo LO Press 1PSL-4749D	Called - failed - replaced
18806902	10/11/88	1A	TSH-19112 - JW Hi Temp	Found out of tol. during PM - recal.
18805581	10/18/88	1A	TSH-19112 - JW Hi Temp	Found defective - replaced
18807746	11/03/88	1A	TSH-19110 & 11 - JW Hi Temp	Just PM'ed - found bad (out of cal.) - found 2 bad sensors from whse. - finally replaced w/good sensors
18806912	10/08/88	1B	1PS-19177 - LO LO Press 1PS-19183 - LO LO Press	Failed cal - wouldn't reset properly - replaced under 18807392
18807085	10/09/88	1A	Hi Main Brng Temp Sensors G, H, F	Replaced due to air leaks
18807637	10/27/88	1B	1TSH-19154 HI LO Temp 1TSH-19119 JW HI Temp	Re-calibrated OK Wouldn't cal - 1st new sw. from whse. also wouldn't cal - finally got one from whse. to cal OK
18807793	10/31/88	1B	1TSH-19117 & 18 JW HI Temp	Failed - had to replace w/new switches
18906313	12/13/89	1B	1TSH-19154 HI LO Temp	Spurious alarm on D/G 1B Control Panel - most likely intermittent switch

<u>MEMO #</u>	<u>DATE</u>	<u>D/G</u>	<u>SENSOR</u>	<u>COMMENTS</u>
28800543	01/24/88	2A	2XS-4746A HI Vibration	Found venting - replaced
28800810	02/05/88	2A	2PSL-19114 JW Lo Press	Venting - found out of tolerance - recalcd
28800552	01/25/88	2A	2TSH-19146 HI Temp LO	Cal checked when connected to D/G
28800918	02/05/88	2A	2PSL-4749 A,B,C LO Lo Press	Cal checked - OK
28800919	02/05/88	2A	2PSH-4744 HI Crank case Press 2PSL-4749 D,E Lo Press Turbo LO	Cal checked - OK
28801450	02/26/88	2B	2TSH-19153 LO HI Temp	Cal checked - OK
28801547	02/26/88	2B	2PSL-4859 A,B,C, Lo Press LO	Cal checked - OK
28801546	02/26/88	2B	2PS-4854 Crankcase Hi Press 2PSL-4859 D,E, LO Press Turbo LO 2PSL-19121 JW Lo Press	Cal checked - OK
28802648	04/13/88	2B	2XS-4856A D/G Eng HI Vibration	Would not trip - Replaced
28803452	04/20/88	2B	2TSH-19119 JW HI Temp	Found venting - calibrated
28805619	06/07/88	2B	2PSL-4859 A,B,C, Lo Press LO	Cal checked due to Calcon Part 21 - no adj. required
28805620	06/07/88	2A	2PSL-4749 A,B,C Lo Press LO	Cal checked due to Calcon Part 21 - no adj. required
28807390	07/21/88	2B	2TSH-19117, 18, 19 HI JW Temp	Engine tripped due to 2 switches venting - recalibrated
28819595	12/08/88	2A	2XS-4745B Turbo HI Vibration	Switch malfunctioned and tripped engine - replaced

<u>AND #</u>	<u>DATE</u>	<u>D/G</u>	<u>SENSOR</u>	<u>COMMENTS</u>
19000016	01/04/90	1B	1PSL-4859E Rt Bank Lo Turbo Oil Press	Found switch venting - replaced
19000439	03/01/90	1A	Various	PM of various trip sensors signed off 3/10/90
19000442	03/14/90	1B	1TSH-4857E Hi Temp Main Brng	Found out of cal high - replaced under normal PM
19000443	03/05/90	1A	1TSH-4747F Hi Temp Main Brng	Found out of cal high - replaced under normal PM
19001433	03/22/90	1A	1PS-4749A,B,C Lo LO Press  1PSL-19114 Lo JW Press	Post Event Investigation found A switch would not reset replaced all 3 Cal checked - OK
19001482	03/22/90	1B	1TSH-4850 Hi Temp LO	Would not cal to within tolerance - replaced
19001511	03/24/90	1B	1TSH-19117, 18, 19 Hi Temp JW  1TSH-19153 Hi Temp LO	19117 and 19 were replaced - 18 recaled  Replaced
19001542	03/26/90	1B	1PSL-4903 P-3	Cal checked - OK
19001629	03/29/90	1A	1TSH-19110, 11, 12 Hi Temp JW  1TSH-19146 Hi Temp LO	Cal checked - OK  Cal checked - acting sluggish replaced
19001677	03/30/90	1A	1PSL-4749D,E Turbo LO Lo Press	Cal checked - OK
19001683	03/31/90	1A	1TSH-19111, 12 Hi Temp JW	Found venting - replaced