

DOCKETED
USNRC*I-MOSBA-111*

Sheet 1 of 10

'95 OCT 26 DATA SHEET 1

Exhibit III, page 1 of 20Report: Page 1 of 22OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

EVENT REPORT

EVENT TITLE: DG 2A Start Failure
REPORT NUMBER: 2-90-005
DATE(S) OF EVENT: 7-11-90
EVENT CLASSIFICATION: B

Names of
EVENT REVIEW TEAM MEMBERS

Ed Kozinsky
George Frederick
Paul Kochery
Ken Stokes
Charles Coursey
Joe D'Amico

Signature of
EVENT REVIEW TEAM LEADER

William A. McCarley

DATE COMPLETED

7-19-90

MANAGEMENT REVIEW AND APPROVAL

Jim Evers

PRB Review Required YES ☒ NO ☐PRB ChairmanMeeting No. / Date

NUCLEAR REGULATORY COMMISSION

9601230132 951011
PDR ADOCK 05000424
G PDR

Docket No. 50-424/425-OLA-3 EXHIBIT NO. 2-111In the matter of Georgia Power Co. et al., Vogtle Units 1 & 2☐ Staff ☐ Applicant ☒ Intervenor ☐ Other☐ Identified ☒ Received ☐ Rejected Reporter SDDate 10/11/95 Witness

DATA SHEET 1

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* PAGE

1. REPORT NARRATIVE (PER SECTION 4.6)
2. EVENT DATA COLLECTION
3. CHRONOLOGY.
4. ** PERSONAL STATEMENTS . . . (Figure 2)
5. ROOT CAUSE DETERMINATION (PER 00058-C).
6. ADDITIONAL SUPPORTING ITEMS

* ERTL TO NUMBER EACH PAGE OF THE REPORT AND ENTER APPROPRIATE PAGE NUMBERS. ADDITIONALLY, THE ERTL WILL ENSURE THE EVENT REPORT NUMBER APPEARS ON EACH PAGE OF THE REPORT.

** INFORMATION WILL BE PRESENTED ON THE INDICATED FIGURE.

UNIT STATUS

Unit 2 was at 80% power at the time of the 2A diesel start failure. -Unit 1 was at 100% power. No equipment related to the diesel test out of service.

EVENT DESCRIPTION

On July 11, 1990, diesel generator 2A was being tested during a routine surveillance per procedure 14980-2. The right air bank was isolated for the July test of the left air bank. When the engine start button was pushed by the control room operator, the engine began to roll with starting air. The engine rolled twice and stopped, according to the local operator in the diesel room. The engine failed to start. The diesel was declared inoperable and the Technical Specification action statement was initiated.

On July 5, 1990 a similar event occurred when diesel generator 1B failed to start. The causes and corrective actions of this event are consistent with the DG 2A incident of July 11, 1990.

TROUBLE SHOOTING

The seizing of these air start valves was discovered by a "pop test" performed under the manufacturer's direction. This test applies approximately 100 psi of air to the starting air valve at the engine subcover. An audible sound can be heard on valve opening and closing, if the valve is not sticking. All valves initially noted to be sticking were machined to a tolerance of 0.002 to 0.003 and retested with no problems found.

The engine was started and loaded to 100% and maintained until temperatures stabilized. The "pop test" was re-performed with seven air start valves still indicating problems. One cap stud was unterqued during cap removal for inspection when we heard the piston pop open. A few other caps were loosened with the same results. All caps were removed on the problem cylinders and placed on a true flat surface. Some were found to be warped and all had irregular bore surfaces. All caps were replaced and pistons machined to approximately 0.003.

ROOT CAUSE:

Diesel generator 2A failures to start due to starting air valve piston seizure within its associated cap assembly appears to be the result of marginal clearance between the piston and cap. This condition exists apparently due to manufacturer machining process which allow uneven bore conditions on the cap and in some cases caps with flanged surfaces which are not flat. Secondly, the tolerances specified by the manufacturer were 0.001 to 0.003 between piston and cap. This clearance may have been sufficient for ambient temperature but did not allow for expansion of the piston inside the cap during engine standby or operating conditions or to overcome any machining irregularities.

The event critique team determined that ineffective corrective actions exists with respect to the ability to resolve Diesel Generator start problems. The July 11, 1990 start failure of DG 2A was the fourth occurrence of this problem. A troubleshooting MWO had been written but not yet implemented. The third failure of DG 2A occurred on April 20, 1990. An event critique team was not convened after this failure contrary to the policy established as a result of the SAE event critique.

CORRECTIVE ACTIONS

All Diesel Generator 2A air start pilot valve pistons have been verified to move freely inside the cylinder walls. Pop tests are to be performed immediately on Diesel Generators 2B, 1A and 1B to demonstrate freedom of movement. Any sticking conditions noted will be appropriately corrected. Additionally, Maintenance Procedures 28714, 28713, 28575, and 28576 are being revised to include provisions for pop tests during each refueling outage.

To minimize the possibility of sticking, Engineering is assessing the gap minimum clearance distance between the piston and cylinder walls. Any changes in the desired minimum gap clearance will be reviewed against recorded gap distances for Diesel Generator 1A, 1B, and 2B for possible replacement. Also, changes to the minimum gap clearance will be incorporated into Maintenance Procedures 28714, 28713, 28575 and 28576.

During the next scheduled tear down of Diesel Generators 1A, 1B, and 2B, the surfaces of the air start pilot valves will be checked for machining irregularities that could lead to sticking conditions. Replacement or reconditioning will be performed as necessary.

To correct the problem of ineffective corrective actions noted as a result of four Diesel Generator failures to start, the event critique team recommends that the policy of having event critiques for Diesel Generator failures should be continued until plant management determines that Diesel Generators are sufficiently reliable. This policy was established as a corrective action from the 3/20/90 SAE event.

IV. ANALYSIS OF EVENT

Diesel Generator 2A is one of two independent power sources that provide power to class 1E busses. During the time the 2A diesel engine was under investigation, the redundant 2B diesel generator was capable of performing its intended function. The plant entered an action statement for technical specification 3.8.1.1 which requires initiating a plant shutdown if the diesel cannot be made operable within 72 hours.

Prior failures of this engine may not have been fully investigated to ensure the causes of the failures were found and corrected. The results of this investigation indicate that there existed a manufacturing or installation error that resulted in deformed air start pilot valve cylinder. The deformity revealed itself in a random pattern. The effects of the deformity could only be observed on an engine start after the engine had been shut down from a previous run and the engine stopped with a particular combination of faulty pilot valve and crankshaft position alignment. There were a total of 7 cylinders with questionable air start pilot valves.

On a normal attempted restart with the air start pilot valve malfunctioning, the 5 second burst of air was not adequate to start the engine rolling over. The burst of air was adequate to change the alignment of crankshaft position and faulty pilot valves so that any subsequent attempt to start the engine would be successful.

Based on the availability of the redundant 2B diesel at the time the 2A diesel was declared inoperable and the fact that the 2A diesel should have started under emergency conditions, there was no adverse effect on plant safety or the health and safety of plant staff or the general public.

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DATA SHEET 1
EVENT DATA COLLECTION

Event Report No. _____
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1. EVENT DESCRIPTION
 EVENT DATE 7/11/90 UNIT 2 EVENT TIME 0220 CD
 DEFICIENCY CARD NUMBER 2-90-067
 (IF REQUIRED)
2. TYPE OF EVENT

A. REACTOR TRIP ()	F. RADIOACTIVE SPILL/ UNCONTROLLED RELEASE ()
B. FORCED REDUCTION ()	G. LIQUID INVENTORY LOSS ()
C. PLANT TRANSIENT ()	H. OTHER SIGNIFICANT EVENT (<input checked="" type="checkbox"/>)
D. ESFAS ()	
E. PERSONNEL CONTAMIN ()	
3. EVENT REVIEW TEAM CALLED OUT: TIME 0300
 SAER INFORMED: TIME _____
 CORPORATE DUTY MANAGER INFORMED: TIME _____
4. DATA COLLECTION ASSIGNMENT JD WILLIAMS
5. DATA: FOR REACTOR TRIPS COMPLETE 10006-C, AND GIVE A COPY TO THE EVENT REVIEW TEAM. FOR ALL OTHER EVENTS, COMPLETE THE SECTION 5 THROUGH 16 AND PERSONAL STATEMENTS.

SHIFT PERSONNEL	ACTIVITY PERFORMED AT THE TIME OF THE EVENT	STATEMENT ATTACHED YES OR NA
SS <u>JD WILLIAMS</u>	<u>ROUTINE SHIFT DUTIES</u>	<u>N/A</u>
USS <u>E.M. THORNTON</u>		<u>N/A</u>
SSS <u>JP STEPHENS</u>		<u>N/A</u>
RO <u>L. CROSBY</u>		<u>N/A</u>
PO <u>S. DYER</u>		<u>N/A</u>
STA <u>JD WILLIAMS</u>	<u>ROUTINE SHIFT DUTIES</u>	<u>N/A</u>
OTHERS INVOLVED _____		<u>N/A</u>
<u>A. SWEAT</u>	<u>COMMON PC</u>	<u>YES</u>
<u>L. ADAMS</u>	<u>U2 CAO</u>	<u>YES</u>
<u>S. COBB</u>	<u>U1 CAO</u>	<u>YES</u>

6. DATA TO BE COLLECTED (SHIFT SUPERINTENDENT TO CHECK ITEMS)
 NOTE: REMOVE THE DISK PACK AFTER A TRIP/SI.

PLANT COMPUTER ALARM PRINTOUT ()	PLANT COMPUTER EVENT LOGS ()
ATSI PRINTOUT ()	ERF COMPUTER EVENT LOGS ()
FAULT RECORDER PRINTOUT ()	ERF COMPUTER TREND PRINTS ()
CHART RECORDERS (LIST) _____	

COPIES OF:	NRC-GC NOTIFICATION WORKSHEET ()
USS LOGS ()	AUX BLDG OPERATOR LOG ()
TURBINE BLDG LOG ()	RWO LOG ()
CONTROL BLDG OPERATOR LOG ()	ELECTRICAL LOG ()
OUTSIDE OPERATOR LOG ()	UNIT CONTROL ()
CHEMISTRY _____	
HP _____	
MWO'S _____	

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7. PLANT CONDITION WHEN APPROPRIATE

	PRE-EVENT	MAXIMUM/MINIMUM VALUE	POST EVENT
MODE		/	
REACTOR POWER		/	
BORON CONCENTRATION		/	
STEAM GENERATOR LEVEL	1*	/	
* Use NR or WR,	2*	/	
whichever is	3*	/	
indicating	4*	/	
GENERATOR OUTPUT		/	MWE
PRESSURIZER LEVEL		/	

8. PLANT CONFIGURATION

8.1 OFF NORMAL STATUS OF PLANT SYSTEMS ACCU PIP 2 CDS8.2 TESTS AND SURVEILLANCES IN PROCESS 1498C-2, DGOPERABILITY TEST

8.3 OTHER OPERATIONS IN PROGRESS AT THE TIME OF THE EVENT

NORMAL SHIFT ROUTINE

9. FOR ESFAS ACTUATION OR FAILURE AUTOMATIC () MANUAL () N/A ()

9.1 LIST CHANNEL ACTUATED/FAILED

EXPLAIN SYSTEM RESPONSE

9.2 DID THE ESFAS COMPONENTS OPERATE CORRECTLY?
WITHOUT UNDUE DELAY? YES () NO ()
YES () NO ()

9.3 EXPLAIN ANY ABNORMAL SYSTEM ESFAS RESPONSES. WHY?

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9.4 DESCRIBE ANY OTHER MALFUNCTIONS NOTICED: _____

9.5 APPARENT EVENT CAUSE WAS _____

10. CORRECTIVE ACTIONS

10.1 WHAT IMMEDIATE CORRECTIVE ACTIONS WERE TAKEN AS A RESULT OF THE EVENT?

PERFORMED 14230-2, DIFF-SITE SOURCE
IDENTIFICATION & ENTERED UCC 2-90-24310.2 WHAT SUBSEQUENT CORRECTIVE ACTIONS ARE IN PROGRESS AS A RESULT OF THE EVENT? UCC 2-90-243

10.3 WHAT FURTHER CORRECTIVE ACTIONS ARE RECOMMENDED? _____

11. LIST CORRECTIVE ACTION TAKEN FOR EACH ABNORMAL OCCURRENCE OR EQUIPMENT MALFUNCTION THAT ACCOMPANIED THE EVENT (STATE WHETHER COMPLETED, IN PROGRESS, OR PROPOSED).

12. WERE PROCEDURES USED ADEQUATE?
WHY NOT? _____

YES () NO ()

13. DID THE OPERATORS AND OTHER PERSONNEL HANDLE THE EVENT CORRECTLY?
EXPLAIN. DISCUSS CORRECTIVE ACTION TO DATE. _____

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14. WAS AN EMERGENCY PLAN EAL REACHED? DESCRIBE LEVEL INVOLVED (NOUE, ALERT, SITE AREA, GENERAL). _____

15. LIST LCO'S ENTERED

LCO NO.	DESCRIPTION	INITIALS
2-70 245	DG 2A FAILED TO	fer
	START 3.7.13	

16. LIST ANY SAFETY LIMITS EXCEEDED. TECH SPEC AND DESCRIPTION

COMPLETED BY: _____
DATA COLLECTOR

PROCEDURE NO.

VEGP

00057-C

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Event Report No.

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CHRONOLOGY

DATE/TIME

EVENT

See event description

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INVESTIGATION QUESTIONS

A. GENERAL

1. DOES THE EVENT REPRESENT A PREVIOUSLY UNFORESEEN ACCIDENT SEQUENCE? YES/NO
2. DOES THE FAILURE DIRECTLY OR THROUGH INTERACTION WITH OTHER SYSTEMS DEGRADE THE PERFORMANCE OF ANY SAFETY-RELATED EQUIPMENT? YES/NO
3. DOES THE FAILURE DIRECTLY OR THROUGH INTERACTION WITH OTHER SYSTEMS INCREASE THE PROBABILITY OF AN ACCIDENT? YES/NO
4. DOES THIS FAILURE CHALLENGE OR ACTIVATE SAFETY SYSTEMS? YES/NO
5. DOES THE EVENT INCREASE THE PROBABILITY OF TRANSIENT OCCURRENCES AND/OR REACTOR TRIPS? YES/NO
6. DURING THE EVENT, DID THE OPERATIONS STAFF RESPOND CORRECTLY? YES/NO
7. ARE TRAINING KNOWLEDGE OBJECTIVES, PERFORMANCE TASKS AND CONTROLS ADEQUATE TO PROMOTE THE PROPER PERFORMANCE OF THE OPERATIONS STAFF UNDER SIMILAR CIRCUMSTANCES? YES/NO
8. BASED ON A COMPARISON OF THIS EVENT WITH PREVIOUS EVENT REPORTS AND/OR FSAR ANALYSES, WERE THERE ANY ABNORMAL OR DEGRADED INDICATIONS? YES/NO
9. BASED ON COMPARISON OF RELATED SIMILAR INDUSTRY AND IN-HOUSE EVENTS, IS THIS EVENT A REOCCURRENCE OF A PREVIOUS EVENT: YES/NO *4th occurrence*
10. DURING THIS EVENT, DID ALL AFFECTED SYSTEMS RESPOND AS EXPECTED? YES/NO
11. DID THE INITIAL EVENT PRODUCE UNANTICIPATED SECONDARY EFFECTS WHICH COMPLICATED OR INCREASED THE CONSEQUENCES OF THE EVENT? YES/NO

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INVESTIGATION QUESTIONS (CONT'D)

12. BASED ON COMPARISON OF SIMILAR INDUSTRY AND IN-HOUSE EVENTS WERE PREVIOUS CORRECTIVE ACTIONS/IMPLEMENTATION EFFECTIVE? YES/NO *no effective appears to have occurred from previous events corrective action*
13. IF QUESTIONS 1, 2, 3, 4, 5, 8, 9, OR 11 ARE ANSWERED YES, DESCRIBE THE REASON IN DETAIL IN THE EVENT REPORT.
14. IF QUESTION 6, 7, 10, or 12 ARE ANSWERED NO, DESCRIBE THE REASON IN DETAIL IN THE EVENT REPORT.

B. PERSONNEL ERRORS

1. WERE JOB ENVIRONMENT CONDITIONS SUCH AS LIGHTING, VENTILATION, EXTREME TEMPERATURE OF PHYSICAL ACCESS TO THE TASK CONTRIBUTING FACTORS? YES/NO
2. WERE PROPER TOOLS AVAILABLE AND USED? YES/NO *NA 7-13-90*
3. WERE WRITTEN APPROVED PROCEDURE AVAILABLE AND PROPERLY FOLLOWED? YES/NO
4. IF THE PROCEDURE WERE FOLLOWED, WAS PROCEDURE COMPLIANCE A CONTRIBUTORY CAUSE? YES/NO
5. WERE ADEQUATE INSTRUCTIONS GIVEN AND COMPREHENSION VERIFIED? YES/NO
6. WERE THE PERSONNEL INVOLVED IN THE PROPER PHYSICAL CONDITION? YES/NO
7. DID THE PERSONNEL INVOLVED HAVE ERRONEOUS IDEAS AND/OR CONCEPTS ABOUT THE SYSTEM INVOLVED? YES/NO
8. DID THE PERSONNEL INVOLVED HAVE PREVIOUS EXPERIENCE AND/OR TRAINING ON THE SYSTEM INVOLVED? YES/NO
9. DID THE PERSONNEL RECEIVE A BRIEFING OF THE EVOLUTION PRIOR TO STARTING? YES/NO *NA Briefing for this event is a non-issue*
10. WERE COMMUNICATIONS ADEQUATE FOR THE EVOLUTION? YES/NO
11. WERE COMMUNICATIONS TESTED PRIOR TO STARTING? YES/NO

NA NA - 15542

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INVESTIGATION QUESTIONS (CONT'D)

12. WAS SUPERVISION INVOLVEMENT ADEQUATE FOR THE EVOLUTION BEING CONDUCTED? YES/NO
13. WERE THE PERSONNEL THAT INITIATED OR ADVERSELY CONTRIBUTED TO THE EVENT QUALIFIED TO PERFORM THEIR ACTIVITIES PRIOR TO AND DURING THE EVENT? YES/NO
14. IF QUESTIONS 1, 4 OR 7 ARE ANSWERED YES, DESCRIBE IN DETAIL IN THE EVENT REPORT.
15. IF QUESTIONS 2, 3, 5, 6, 8, 9, 10, 11, 12 OR 13 ARE ANSWERED NO, DESCRIBE IN DETAIL IN THE EVENT REPORT.

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EVENT PERSONAL STATEMENT*

1. a. FOR THE PERIOD PRIOR TO, DURING, AND AFTER THE EVENT, SUMMARIZE THE SEQUENCE OF EVENTS THAT YOU OBSERVED, AND YOUR SPECIFIC ACTIONS TAKEN BASED ON INDICATIONS.

Leigh Ann Atkins: Julian Cobb performed the moisture check on the 24 diesel. The #1 receiver is isolated while performing the operability test (14580). Everything in the procedure went as expected until the Control Room tried to start the diesel. Indicators
 ① disabled starting air low - ② generator trouble - ③ failure to start (C.R. in failure to start was flashing. We notified C.R. and took no operator action)

- b. List alarms that illuminated and/or were reset.

① disabled low starting air ② generator trouble & ③ failure to start. Failure to start light reset. Ground re-throw dropped. Leigh Ann Atkins reset the LCC.

2. DID ANY AUTOMATIC SYSTEMS OR EQUIPMENT MALFUNCTION REQUIRE ANY OPERATOR INTERVENTION? (Describe)

No

3. DID THIS EVENT REVEAL ANY PROCEDURAL INADEQUACIES? (Describe)

No (if so, not known at this time)

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4. IF THIS EVENT OCCURRED AGAIN, WHAT WOULD YOU DIFFERENTLY?

Nothing

5. ARE THERE ANY LESSONS LEARNED FROM THIS EVENT THAT YOU BELIEVE SHOULD BE INCLUDED IN TRAINING? (Describe)

NO

6. COMMENTS:

DIESEL GENERATOR WENT COBB. 2 REVOLUTIONS
during the start attempt. GIGGING AIR WAS
GROUND 210 PSI WHEN OBSERVED AFTER ATTEMPTED
START

SIGNATURE
Jeff Conn Adams

TITLE
PEC

DATE
11-11-90

Justin Cobb

P.E.O.

7-11-90

* For reactor trips the personnel statement form in Procedure 10006-C may be used in lieu of this form.

FIGURE 2 (CONT'D.) EXAMPLE

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EVENT PERSONAL STATEMENT*

1. a. FOR THE PERIOD PRIOR TO, DURING, AND AFTER THE EVENT, SUMMARIZE THE SEQUENCE OF EVENTS THAT YOU OBSERVED, AND YOUR SPECIFIC ACTIONS TAKEN BASED ON INDICATIONS.

see attached memo

- b. List alarms that illuminated and/or were reset.

on attached memo

2. DID ANY AUTOMATIC SYSTEMS OR EQUIPMENT MALFUNCTION REQUIRE ANY OPERATOR INTERVENTION? (Describe)

no

3. DID THIS EVENT REVEAL ANY PROCEDURAL INADEQUACIES? (Describe)

In the event it is determined I failed to hold the DE start push button in long enough. Some guidance is required on how long to hold push button.

FIGURE 2 EXAMPLE

VEGP

00057-C

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4. IF THIS EVENT OCCURRED AGAIN, WHAT WOULD YOU DIFFERENTLY?

nothing

5. ARE THERE ANY LESSONS LEARNED FROM THIS EVENT THAT YOU BELIEVE SHOULD BE INCLUDED IN TRAINING? (Describe)

unknown at this time

6. COMMENTS:

none

SIGNATURE



TITLE

PO

DATE

7-11-90

* For reactor trips the personnel statement form in Procedure 10006-C may be used in lieu of this form.

FIGURE 2 (CONT'D.) EXAMPLE

Memo—Long Form

507

DATE
7-11-90

FROM AL Went

TO

TO

TO

TO

- | | |
|---|--|
| <input type="checkbox"/> NOTE AND FILE | <input type="checkbox"/> PREPARE REPLY FOR MY SIGNATURE |
| <input type="checkbox"/> NOTE AND RETURN TO ME | <input type="checkbox"/> TAKE APPROPRIATE ACTION |
| <input type="checkbox"/> RETURN WITH MORE DETAILS | <input checked="" type="checkbox"/> PER YOUR REQUEST |
| <input type="checkbox"/> NOTE AND SEE ME ABOUT THIS | <input type="checkbox"/> SIGNATURE |
| <input type="checkbox"/> PLEASE ANSWER | <input checked="" type="checkbox"/> FOR YOUR INFORMATION |
| <input type="checkbox"/> FOR YOUR APPROVAL | <input type="checkbox"/> INVESTIGATE AND REPORT |

URGENT

While performing OSP-14980-2 DG 2A monthly operability test the DG failed to start. The following info was received in the Control Room. I was on step 5.1.12 in procedure OSP-14980-2 and had depressed the DG start push button. I heard the DG start to roll over the headset and heard the Local Alarm go off along with the Control Room Annunciations. I released the push button (All in about 1 sec.). Steve Dyer and I had the stopwatches in hand timing the Gen Volt & Freq. After about a couple of seconds when I realized something was wrong I looked up to see the following Control Room Annunciations.

ALB 34	DO1	2APT Trouble	} alarm for start
ALB 34	DO3	2AD12 Trouble	
ALB 34	FO2	2AD11 Trouble	
ALB 35	FO2	DG low starting air this Ann.	

was in prior to start because per the procedure step 5.1.8.1 we had received #1 isolated with 2-2403-64765. Due to delays in starting this annunciation was in prior to starting the DG. but air

Memo—Long Form

DATE 7-11-90

FROM _____
TO _____
SUBJECT _____

- | | |
|---|--|
| <input type="checkbox"/> NOTE AND FILE | <input type="checkbox"/> PREPARE REPLY FOR MY SIGNATURE |
| <input type="checkbox"/> NOTE AND RETURN TO ME | <input type="checkbox"/> TAKE APPROPRIATE ACTION |
| <input type="checkbox"/> RETURN WITH MORE DETAILS | <input checked="" type="checkbox"/> PER YOUR REQUEST |
| <input type="checkbox"/> NOTE AND SEE ME ABOUT THIS | <input type="checkbox"/> SIGNATURE |
| <input type="checkbox"/> PLEASE ANSWER | <input checked="" type="checkbox"/> FOR YOUR INFORMATION |
| <input type="checkbox"/> FOR YOUR APPROVAL | <input type="checkbox"/> INVESTIGATE AND REPORT |

COMMENTS

pressure was normal in receiver #2 per local operations. This would be considered normal for present temp.

AIB 35 EOI DG 2A Trouble. Local indication showed this to be so because of the field ground relay. This is a local alarm.

The following data were received which are normal

AIB35 F05 DG 2A Failed to start
AIB36 F03 Is. device Pul Tran "A"
Q1P1 Trouble.

The local operations said they received the same DG alarm as control room. They also reported the DG only made approx. 2 revolutions before stopping. No DG trips announcements were received at either locations and other conditions were normal. Receiver pressures after start attempt were #1 26 psig #2 210 psig with comp #2 running. These pressures were read at the PDG-1 panel.

ROOT CAUSE DETERMINATION WORKSHEET

UNIT 2

SHEET 1 OF

1. EVENT INVESTIGATED: DG 2A Failure to start on
7-11-90

2. EVALUATOR(S)/INVESTIGATOR(S): ERTL

3. RESULTS OF INVESTIGATION/REVIEW (Include references and attach continuation sheets if needed)

a. CAUSE: Poor Specification
Lower end of specification gap (for air start valve
assembly) does not allow for adequate expansion

ROOT CAUSE CATEGORY/EVENT CODE: 21 1 4 E

b. RECOMMENDED CORRECTIVE ACTION(s):

4/14/90 Engineering should assess the gap minimum clearance
distance between the piston and cylinder walls
Engineering should review the gap distance records for
DG's 1A, 1B & 2B to the established min gap distance
identified in item 1 above. Evaluate whether replacement is needed
perform gap testing on DG's 1A, 1B & 2B to verify free
movement of air start pilot valve pistons. Take appropriate
corrective action for those found to be stuck

c. ACTIONS TO PREVENT RECURRENT: (Complete if not included in b above)

2/25/90 Maintenance to revise Procedures 28714, 28713, 28575 & 28576
to include changes to minimum gap distances as determined by Eng'g
7/25/90 Maintenance to revise Procedures 28714, 28713, 28575 & 28576
to include provisions for gap tests during each R.F. outage

Resp. Dept. Mgr. Approval: [Signature] DATE: 9-14-93
Estimated Completion Date: OIT Number:

[Signature] 1 7-10-90 [Signature] 1 7-10-90
INVESTIGATOR SIGNATURE DATE RESPONSIBLE MANAGER/ERTL DATE

4. OITs initiated; commitments reviewed; corrective action approved.

[Signature] 8/14/90
MANAGER TECHNICAL SUPPORT DATE

CONTINUATION SHEET

a. CAUSE: Inadequate manufacturing installation
some cap surface irregularities exist which contribute
to the sticking condition

ROOT CAUSE CATEGORY/EVENT CODE: C1 14C

b. RECOMMENDED CORRECTIVE ACTION(s):

c. ACTIONS TO PREVENT RECURRENCE: (Complete if not included in b above)

Complete.

1 During the next tear down of the DG's
check for surface irregularities

Resp. Dept. Mgr. Approval: _____ DATE: _____
 Estimated Completion Date: _____ OIT Number: _____

a. CAUSE: Management Corrective Actions LTA

Previous corrective actions from DG start
failures were not effective

ROOT CAUSE CATEGORY/EVENT CODE: D4 1

b. RECOMMENDED CORRECTIVE ACTION(s):

1 Continue the policy of having event critiques
for D-G failures (established as a result
of the 3-20-90 SAE event)

c. ACTIONS TO PREVENT RECURRENCE: (Complete if not included in b above)

Resp. Dept. Mgr. Approval: _____ DATE: _____
 Estimated Completion Date: _____ OIT Number: _____

AUDIT CHECKLIST CONTINUATION SHEET

AUDIT # **OP09-90/31** ITEM #

PAGE OF

ON 7-5-90, THE AUDITOR SURVEILLANCE tasks 14980-102 AND 14980-104. AUDIT contacts were: J. E. Bowles, C. H. Williams, M. C. Henry, T. L. Morris, R. K. Pope, and G. A. OUELLETTE. THE AUDITOR VERIFIED THAT ^{CMB 7/5/90} THAT THE FOLLOWING PROCEDURES BEING USED WERE THE CURRENT REVISIONS: 11885-C, Rev 13; 13145-1, Rev 22; AND 14980-1, Rev 20. NO problems were noted. Relative to the 1B diesel the following ^{WELL} ^{NOTED}

First, the auditor observed a cylinder moisture check per 13145-1 as required by step 5.1.3 of 14980-1. (Steps 4.4.1 - 4.4.1.21 of 13145-1)

Next, steps 5.1.4 thru 5.1.9 were observed in the 1B DIESEL GENERATOR ROOM. AT 9:38 EDT, THE DIESEL

Generator failed to start. Discussions with Hank Williams and Keith Pope noted that a trainee had not held the DIESEL GENERATOR START push button for A SUFFICIENT TIME to start the diesel. PEO MORRIS verified alignments AND ON THE NEXT TRY, THE DIESEL GENERATOR STARTED. (WHEN IT FAILED AT

9:38, the following ANNUNCIATORS ON THE ENGINE Control Panel in the 1B diesel Room were LIT:

- GENERATOR Trouble
- Disabled Low Pressure Starting Air
- FAILED to Start

THE AUDITOR THEN WENT TO THE Unit 1 Control Room, AND OBSERVED OUELLETTE & M. Henry IN CONDUCTOR 14980-1.

AUDIT CHECKLIST CONTINUATION SHEET

AUDIT # **OPO9-90/31** ITEM #

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IN THE UNIT 1 Control Room, THE AUDITOR OBSERVED CONDUCT OF STEP 5.2.12 (5.2.12.1-.4 WERE N/A), IN WHICH DIESEL GENERATOR 1B WAS PARALLELED TO THE BUS, THROUGH STEP 5.2.16. ALSO, STEP 5.4 - DIESEL GENERATOR FUEL OIL TRANSFER SYSTEM TEST - WAS OBSERVED. THE AUDITOR VERIFIED THAT THE STOP WATCHES CALLED OUT IN STEP 4.2.a WERE CURRENTLY CALIBRATED. VP1272 cal due date WAS 10/5/90 & VP1276 cal due date WAS 10/9/90.

THE AUDITOR RETURNED TO THE 1B DIESEL GENERATOR Room AND OBSERVED PEO MORRIS PERFORMING 11885-C, "DIESEL GENERATOR OPERATING Log." ALSO, THE AUDITOR OBSERVED PEO MORRIS PERFORM 14980-1, SECTION 5.5, "DIESEL GENERATOR AIR Start Compressor TEST." (NOTE: THE AUDITOR ALSO OBSERVED INDEPENDENT VERIFICATION FOR THE moisture check - discussed on the previous page - per 13145-1.) NO PROBLEMS WERE NOTED. THE AUDITOR RETURNED TO THE UNIT 1 Control Room AND DISCUSSED THE SURVEILLANCE WITH Bowles, Henry, & OVELLETTE. THE AUDITOR VERIFIED THAT THE ACCEPTANCE CRITERIA OF SECTION 6.0 (14980-1) HAD BEEN MET. SINCE THE FAILURE TO START WAS ATTRIBUTED TO OPERATING ERROR AND NOT CONSIDERED TO BE A VALID TEST FAILURE (SEE TABLE 1 OF 14980-1). NO PROBLEMS WERE NOTED WITH THIS SURVEILLANCE.