UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	:	
	:	Docket Nos. 50-424-OLA-3
GEORGIA POWER COMPANY, et al.	:	50-425-OLA-3
	:	
	:	Re: License Amendment
(Vogtle Electric Generating Plant, Units 1 and 2)	:	(Transfer to Southern Nuclear)
	:	
	:	ASLBP NO. 93-671-OLA-3

AFFIDAVIT OF KENNETH R. HOLMES

I, Kenneth R. Holmes, having been duly sworn, state as follows:

1. I am over the age of 18 years and am competent to execute this Affidavit. I am employed by Georgia Power Company as the Manager of Maintenance at the Vogtle Electric Generating Plant.

2. In March and April of 1990, I was the Plant Vogtle Manager of Training and Emergency Preparedness. Following the March 20, 1990 Site Area Emergency ("SAE"), I was assigned to be the Team Leader of an Event Review Team, comprised of a cross-section of plant technical staff, which was established to analyze the SAE event, determine its root cause and recommend corrective actions to the Vogtle General Manager. See Event Review Team Report 1-90-03 (Intervenor Exhibit II-124) at 2.

3. The Event Review Team collaborated with Vogtle technical staff and vendor technical experts, and consulted with the NRC, in the development of a detailed test plan designed to identify the root cause of the 1A diesel failure on March 20 and to restore it

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to an operable condition. Id. at 19. The test program of the 1A diesel involved extensive testing and recalibration of components in the diesel trip logic system as well as inspections of the engine and certain support systems.

4. Georgia Power's proposed test plan for the 1A diesel evolved during the days following the SAE. On March 24, 1990, as depicted on a schedule attached hereto as Exhibit A, the testing consisted of an undervoltage ("UV") test, logic testing, sensor testing, two functional tests (to verify that the diesel functioned properly following modification work), and another UV test.[1] On March 24, Mr. Bockhold advised Mr. McCoy that he would show this schedule, referred to as a "fragnet,"[2] to the NRC's Mr. Ken Brockman. See transcript of Mosbaugh Tape No. 11, attached hereto as Exhibit B, at 5-6.

5. Testing of the 1B diesel proceeded between March 25 and 28, when the 1B diesel was declared operable. With the 1B diesel operable, testing on the 1A diesel could then proceed.

6. By March 28, 1990, the 1A diesel test plan had further evolved and was discussed with the NRC Incident Investigation Team ("IIT") during a transcribed meeting at Plant Vogtle. See IIT Document No. 145, Tr. 76-97, a copy of which is attached hereto as

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[1] The testing schedule also shows the following testing to be performed on the 1B diesel: Logic Testing, Sensor Testing, Sequencer Testing, UV Testing, and functional testing.

[2] A "fragnet" is an acronym for a fragment of the outage schedule network. It is used as a planning tool in forecasting expected work activities. The fragnet is updated based on reported work completion to provide an historical "as-built" work chronology.

Exhibit C. During the March 28 meeting, the test plan was illustrated on a slide transparency and on a fragnet, both of which are attached hereto as composite Exhibit D. As of March 28, the elements of the proposed 1A diesel testing program were as follows:

a. An Undervoltage ("UV") Test No. 1;

b. Logic Board Testing;

c. Calcon Sensor (Calibration) Testing;

d. Sequencer Functional Testing;

e. Bubbler (Sensor Air Line Leakage) Testing;

f. Multiple Start Tests;

g. UV Test No. 2; and

h. Operability Test, performed pursuant to Vogtle Tech. Spec. surveillance Procedure No. 14980, a copy of which is attached to Mr. Bockhold's Affidavit as Exhibit C.[3]

7. Subsequent to March 28, Georgia Power added two other tests to the test program: (1) Diesel Trip Timing Test, and (2) Jacket Water Temperature Test.[4]

8. A number of the 1A diesel testing activities identified above were described in NUREG-1410, Appendix J. As discussed in NUREG-1410, Appendix J, at PP. J-12 to J-20, the testing was designed to recreate the sequence of events that occurred during

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[3] Pursuant to comments made by IIT personnel during the March 28 meeting (IIT Document #145, Tr. 95-97), Georgia Power also committed to evaluate the air quality of the diesel instrument air system. Georgia Power's evaluation of air quality is described in the Supplemental Testimony of George Bockhold, Jr. on Diesel Generator Air Quality Statements.

[4] The Jacket Water Temperature Test was described in Georgia Power's April 9, 1990 letter to the NRC at P. 2, item f.

the SAE, while the diesels were being closely monitored, and to demonstrate the proper functioning of the pneumatic sensors that collectively made up the diesel generator automatic shut down logic. The plan focused on (1) the engine-mounted pneumatic sensors that initiate diesel generator trip signals on jacket water low pressure, jacket water high temperature, and turbo charger oil low pressure, (2) the air lines that connect the sensors with the pneumatic logic inside the local engine control panel, and (3) the logic that actuates the engine shut-down cylinder when the sensors are tripped. NUREG-1410, at J-12 to J-20. As stated in NUREG-1410, at P. J-13, Georgia Power believed that the series of tests it conducted on the 1A diesel, including sensor testing and encompassing all suspect equipment involved during the incident, provided a sufficiently detailed plan for determining the root cause of the March 20, 1990 1A diesel failure.

9. On April 2, 1990, a draft root cause determination by the Event Critique Team (provided to the IIT on April 1 and attached hereto as Exhibit E) was discussed with the IIT. See IIT Document 168-2, Tr. 3, attached hereto as Exhibit F. By April 2, the test program had narrowed the possible causes for the 1A diesel failure, and the draft root cause provided to the NRC indicated that the Event Review Team believed the most likely cause of the failures was a combination of an intermittent failure of the jacket water temperature sensors and/or inconsistent calibration techniques used on the sensors installed following overhaul of the diesel.

10. Furthermore, Georgia Power observed, and NRC personnel

found merit with the view, that whatever problem existed with the sensors, once the sensors were properly calibrated and installed, the sensors performed reliably. See IIT Document No. 168-2 (Exhibit F), at Tr. 14, 18; IIT Document No. 257 (April 3, 1990 Telephone Conference), Tr. 50, 65 (attached as Exhibit G); IIT Document No. 168-1 (April 4, 1990 Telephone Conference), Tr. 60 (attached as Exhibit H).

11. While Georgia Power and the IIT shared the view that the sensors were the most likely cause of the 1A diesel failure, there was uncertainty regarding the causal mechanism for the sensor problems. See IIT Document No. 200 (April 5, 1990 Telephone Conference), Tr. 28-30, attached as Exhibit I. Georgia Power initiated an independent inspection and testing program with Wyle Laboratories to examine the sensors quarantined at the request of the NRC. NRC personnel were involved in the design and implementation of this independent test program, which was conducted following restart of Vogtle Unit 1. The events leading to the decision to contract with Wyle Laboratories and the results of the Wyle testing are summarized in the Prefiled Testimony of Lewis Ward at 5 and Mr. Ward's July 20, 1994 Affidavit (Ward Exhibit E; GPC Exh. II-63).

12. I am unaware of any formal plan prepared covering the various tests performed on the 1A or 1B diesels other than the fragnets prepared beginning on March 24, 1990. The fragnets were updated on a daily basis throughout the diesel testing. Copies of a number of fragnets which were printed during the relevant time

frame are attached hereto as Exhibit J. Each fragnet is a snapshot at a given moment in time (referred to as the "Data Date") of the work performed, as of that time, and the remaining scheduled work. A copy of a portion of the outage "as-built schedule", attached hereto as Exhibit K, shows what actual reported work was performed (listed as separate work items) during both the 1A and 1B diesel testing, when the work was performed, and the duration ("D") of the work item.[5]

13. Based on the listed work items on the as-built schedule fragnet, the reported work completed on the 1B diesel testing from March 25 until the second diesel operability test was performed on April 5 included the following:

a. Functional Test (DCP 88-070) on Sequencer (3/25 - 3/27)

b. Logic Testing (3/25 - 3/26)

c. Sequencer Operability Test (3/26)

d. Sequencer Test (notify NRC) (3/26)

e. Calibrate Jacket Water Temperature Switches (3/26 - 3/27)

f. Complete Logic Test (3/27)

g. Replace Jacket Water and Lube Oil Temperature Switches (3/27)

h. Emergency Start/Bubble Test (3/27)

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[5] Each work item was performed under and controlled by a Maintenance Work Order ("MWO") and, in some cases, also involved a detailed test procedure to control more complicated work activities. An example MWO (No. 19001576) is attached hereto as Exhibit L. That MWO was used to control certain testing performed on the 1A diesel, including logic testing, bubble testing and multiple start testing; signed-off pages from Procedure No. 27563, used to control the logic testing, were made a part of the MWO.

i. Multiple Start Tests (3/27)

j. UV Test (3/27 - 3/28)

k. Operability Test (14980) (3/28)

l. ESFAS Test (4/4)

m. Implement DCP 90-133 (4/4)

n. Perform Functional Test and Surveillance Test 14980 (4/4 - 4/5)

o. DG 1B Operable (4/5)

14. Based on the listed work items on the as-built schedule fragnet, the reported work completed on the 1A diesel testing from March 28 until the second diesel operability test was performed on April 7 included the following:

a. NRC Test Approval (3/28)

b. U-V Test (3/29)

c. Functional Test (DCP 88-070) on Sequencer (3/29)

d. Sensor/Logic Testing (3/29 - 4/1)

e. Functional Test (DCP 89-057) Lube Oil Pressure Switches (3/30)

f. Replace Turbo Lube Oil Pressure Switches (3/30)

g. Bubble Test (3/30)

h. Film 5 D/G Starts with air compressor isolated (3/31)

i. Receive New Temp. Switches (TSH-19112) (3/31)

j. Calibrate New Temp. Switches (TSH-19112) (3/31)

k. Jacket Water Trip Test (3/31)

l. Install New Temp. Switches (TSH-19112) (3/31)

m. Multiple Start UV Test (3/31-4/1)

n. Bubble Test (3/31)

o. 14980 Surveillance Test (6 Month) (D/G Operability) (4/1)

p. Install Temp. Modification (4/4 - 4/5)

q. Set-up for Temp. Procedure (4/5)

r. Take Standby Data (4/5)

s. Perform Temp. Procedure ((4/5 - 4/6)

t. Implement DCP 90-133 (4/6)

u. Perform Functional Test and Surveillance Test 14980 (4/6 - 4/7)

v. DG 1A Operable (4/7)

15. Prior to the restart of Unit 1, the Event Review Team considered the results of the above testing and concurred with recommendations provided to the Vogtle General Manager that the Unit was safe for restart.

I hereby certify that the foregoing statements are true and correct to the best of my personal knowledge and belief.

Kenneth R. Holmes
Kenneth R. Holmes

Sworn to and subscribed
before me this 12 day of
May, 1995.

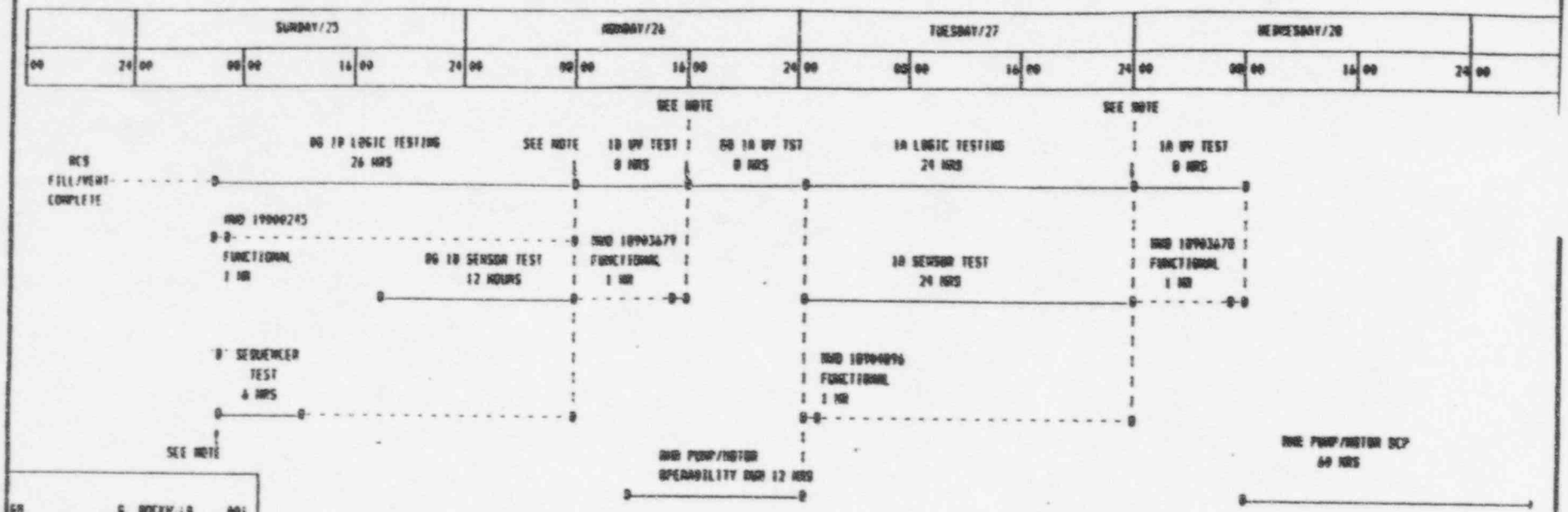
Jewel W Chandler
Notary Public

My commission expires:
Notary Public, Burke County, Georgia
My Commission Expires October 26, 1998

05-3-17-90

UNIT 1

3/24/90



GR	G. ROCKWELL	001
OUTAGE MNGR	R. LACEY	110
OPS MNGR	J SWARTZWELDER	044
MAINT	M. HAUGHEY	310
ASST GR PLNR SPVSR	A. HOSBAUGH	200
PLNR EP	K. HOLMES	003
NPG	S. SWANSON	127
EMD	R. HORTON	107

NOTE: NRC NOTIFICATION REQUIRED
NOTIFICATION TO THE
NRC IS REQUIRED TO BE MADE
BY THE SHIFT OUTAGE MGR
4 HOURS PRIOR TO THE ACTIVITY START.

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Transcript of audiotape No. 11, transcribed by J. Renee Landry, Certified Court Reporter and Notary Public.

BROWN REPORTING, INC.
1100 SPRING STREET, SUITE 750
ATLANTA, GEORGIA 30309
(404) 876-8979

[Approximately 1/4 through side A, during morning status report]

BOCKHOLD: Okay. Will you get it to me after [the morning report] and I'll give it to Harvey Handfinger.

SHIPMAN: Okay.

BOCKHOLD: We're trying to get Ken Burr in touch with Harvey Handfinger The bottom line on that is that we believe we are running into logic problems on the logic board in the diesel, on the "B" diesel, and that could have been the cause of the diesel shutting down on the "A" diesel. So we want to get Ken Burr to help us with that and help with the owners group and that kind of stuff and we'll talk about that later.

MOSBAUGH: I think we just need manpower, too. We got a lot of tough sledding.

[Morning Report given by ALM]

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[About 1/3 through Side A]

MOSBAUGH: Okay. We were doing an eight-hour run on the diesel yesterday, and, when we shut down the diesel, we went in to check some bolts. We found the bolt -- one of the bolts was loose, and that required another four-hour run. On that second four-hour run, several things went

wrong. This is 1B diesel. We got several alarms, a high jacket water alarm and I think, also, a condition that should have tripped it. I think we got some turbo lube oil alarm and one other alarm that I'm

not real sure of. At any rate, the control air pressure dropped to 19 pounds. A trip should have occurred, and a trip did not occur. With all that, they shut the diesel down, and I&C is looking at various things on it.

BOCKHOLD: The problem -- the feeling is that there is probably something wrong in the logic board. We're going to talk to the NRC when they come in at 10:30 this morning about this particular item. And, basically, we're looking to get the logic board expert back on site and to go ahead and methodically troubleshoot the logic board and go ahead and then rerun the diesel after we troubleshoot the logic board and go ahead and then do the loss of off-site power test on the "B" diesel.

McCOY: George, this is one that I think obviously has some potential for being related, as Allen is saying, and we need to be sure that the NRC inspection team participates in anything we do in troubleshooting that and documenting it. And before we fix anything or change anything from an as found condition, we need to get Brockman's concurrence.

BOCKHOLD: We agree with that. We are

basically putting together a fragnet that shows this activity, both the "A" and the "B" diesel activities, and what we currently have planned. And it's fairly extensive fragnet that has a number of testing. The testing right now, the earliest that it could start would be . . . maybe sometime tomorrow, but it's probably not going to be until Monday because we want to get all the right experts here and have everybody go through it with us and make sure that the NRC is available, if they want to watch anything or do anything to go through it or if they had a different opinion about the fragnet to go through it with us. So we're in a process of drafting that fragnet up right now, and I'll be going over that fragnet with Brockman at 10:30.

McCOY: Okay.

[Continuation of Status Report]

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OFFICIAL TRANSCRIPT OF PROCEEDINGS

Agency: U. S. NUCLEAR REGUALTORY COMMISSION

Title: BRIEFING MEETING

Docket No.

LOCATION: Waynesboro, Georgia

DATE: March 28, 1990 PAGES: 1-105

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U. S. NUCLEAR REGULATORY COMMISSION

BRIEFING MEETING

Auditorium
Administration Building
Vogtle Electric Generating Plant
Waynesboro, Georgia

Wednesday, March 28, 1990

The briefing commenced at 10:26 a.m.

APPEARANCES:

On behalf of the Nuclear Regulatory Commission:

WILLIAM LAZARUS
RICK KENDALL
AL CHAFFEE
GENE TRAGER
MILTON HUNT

On behalf of EPRI:

HARVEY WYCKOFF

take a rest break, five minutes?

MR. BOCKHOLD: Five minutes.

MR. CHAFFEE: Let's go off the record.

(A short recess was taken.)

MR. HOLMES: For the last part of this discussion this morning, we'd like to describe our proposed test sequence. As you can see, there's a lot of postulation as to what happened and why it happened, but the event review team still is not certain and we can point our finger and say this was it, so we can go fix that.

So the test schedule we came up with may seem like we're doing some unneeded things and I've heard those comments from people, but we don't think we're doing any harmful things or things that could degrade the plant safety. So you say -- you look up here, we're going to do two under-voltage tests, essentially identical tests, and I'll talk a little bit about the sequence we're going to go through and why we're doing those, but basically we may be doing some overkill, but we think because we can't point very closely at anything, we don't know what else to do.

I'm going to go through the P-2 schedule which kind of summarizes these other items and the other items that we intend to talk about are an under-voltage test, it's a temporary engineering procedure that's been written and approved and I'm going to turn that over to Mike Chance, who

is one of the engineers that will be running that test and talking about that. We ran that test on B diesel just recently. That was a recommendation from the event review team, to try to learn something, let's try to simulate an under-voltage condition on B diesel before we declare it operable to see if there was something that was common to the maintenance that was done on both of them.

So essentially it's the test run on B diesel except rewritten slightly to accommodate for the A train systems.

There's a logic board test that we want to rerun. This was done after the work on the diesel but we think we ought to go back through and look at it. To look at the logic board, that's a Georgia Power procedure to do that logic board test, and Ken Burr is going to talk in a little bit of detail about that logic board test because this is where a lot of those air signals and pressure switches that we talked about on the engine control panel were, and tell you a little bit about what we intend to do very briefly on the logic board test because both of these will take awhile to go out and do. If we need to get back with you after that we probably will before we go and do any more, but just so you can understand our train of thought, I'd like to briefly go through the others and when those two finish, we'll talk a little bit about some sensor testing and basically it's the sensors that are there under our normal

start, the under-voltage start signal. Was one of those sensors an intermittent problem with it that caused the trip. We think it'd be a prudent thing to do to go and look at each of the sensors to see if there's a problem with them.

After the sensor testing, we would like to conduct the functional test on the sequencer design change package. That design change package was put in again to allow us to basically reclose the normal incoming feeder from one of the reserve auxiliary transformers on to the 1-E 4160 busses if it were dead and the diesel didn't tie back on. So we're going to look at that sequencer DCP functional test.

We want to do a bubbler test and basically that is disconnecting all of the lines. You've seen when the sensor reaches a temperature, it will depressurize that part of the line which allows the 60 pound control air to go through to the shutdown logic. What we want to do is to see if there is a leak in some of those pressure sensing lines such that it may be that the sensor didn't detect a problem but the line bled down and therefore allowed the signal to go through, so there's a bubble check we want to do to see if there's a leak on those sensing lines.

Again, kind of as a follow on to the logic board testing, we want to do multiple starts from the logic test panel itself to watch the pressures senses and air relays

pick up.

And finally we want to go back and do the under-voltage test again. We would have been inside the control panel, would have been looking at the sensors, would have been doing a lot of different things to the engine in a very controlled manner, but still we want to go back and do a UV test again at the end to say, you know, have we done something that caused a problem and again we recreated the events that occurred on the 20th, we certainly do not want that to happen.

And finally after that last under-voltage test, we would intend to run the surveillance, the operations surveillance, the 14000 series surveillance, the six month surveillance on the diesel. And that would be our train of thought and if we find something in step one, then all the rest of them are going to change, but right now that's our logic and thinking behind what we intend to go out and do.

Again, the first thing on the schedule -- and I passed around the schedule, the P-2 schedule which our computer prints out for us -- the first thing we do intend to do, we've got this on here to try to get your approval for our test plan -- we need to go out and do the under-voltage test. I sense some concern about what -- we first need to capture what happened to A diesel and I don't think it's all that confusing. We shut the diesel down after the

event on Tuesday, we started it three times. We should be able to get you all the information you want very quickly about when we started it, why we started it, where we started it from and why we shut it down. Three starts, we can explain those very easily. And then we did two maintenance activities, we checked the pressure switches for lube oil and jacket water and replaced the pressure switches for the lube oil, the jacket water was fine. Other than that we have done nothing to the diesel. We want to go out and do the UV test and again that's to recreate the scenario that happened on the 29th we believe. So before we go and do anything else, we want to help you understand what we want to go do and get you involved in going out to do that under-voltage test.

So now I'll turn it over to Mike Chance to talk a little bit about that under-voltage test, what's involved and what we hope to accomplish.

MR. CHANCE: Okay. I don't really have a lot, it's going to be real quick.

Basically what we're intending to perform, depending of course on approval to do so, is perform an under-voltage test on the diesel generator 1-A. What this test performs and intends to do is to simulate a loss of off-site power, actually powering down its fed bus and monitoring response of the diesel generator, any anomalies, all data recorded

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will be used to determine -- to assist in our troubleshooting, we'll say.

Instrumentation we're going to have installed is going to monitor various electrical parameters, we're monitoring frequency voltage, the diesel generator's load. We're also going to have three cameras set up to monitor almost every indicator on the diesel, everything on the diesel generator engine panel and also on the generator panel will be monitored by recorder and we'll have people all over the diesel taking the temperatures of the lube oil inlets and outlets of the lube oil coolers and the jacket water heat exchangers. So basically we're taking almost every piece of data that we can, hoping this will give us some indication of what the problem was the other day.

MR. WYCKOFF: Could I just ask a little question?

MR. CHANCE: Sure.

MR. WYCKOFF: Are you able to get any of the air pressures that are key, or not?

MR. CHANCE: Well we're going to record the air receiver pressures before the --

MR. WYCKOFF: No, I meant in the signal lines.

MR. CHANCE: Oh, no, we're not able to monitor that but all the trips are enunciated on the generator control panel and when those do come in we're going to -- we'll get the alarm, we'll know what's going to come in first --

MR. CHAFFEE: I understand, but what he's leading to is if you had an intermittent problem it would have been helpful but maybe it's not practical to have been able to see when you --

MR. CHANCE: Any time you breach the pneumatic control system, any leakage is going to affect the operation of the control system. It's just like, you know --

MR. CHAFFEE: I think you can do it, I'm just --

MR. CHANCE: It'd be very difficult to do, plus there's a risk of affecting or hiding the real problem. We're not anticipating doing that.

MR. CHAFFEE: When you monitor the gauges, do they reflect the actual conditions that are occurring at the switches? In other words, you've got a switch that detects let's say lube oil pressure --

MR. CHANCE: Uh-huh.

MR. CHAFFEE: -- and that switch is what allows the vent to the pneumatic side to cause a trip. What's going on at that switch in terms of what it's seeing in the lube oil pressure -- is that very much different from what the pressure, the meter that you're monitoring is reading? I mean is there significant differences? Have you thought about that?

MR. CHANCE: I'd have to let Paul answer that.

MR. KENDALL: It's the same pressure but the meter

doesn't read what the switch is sensing.

MR. BOCKHOLD: The answer is no.

MR. CHANCE: That's what I think. Have you looked at whether or not that's significant? I don't know how far the --

MR. BOCKHOLD: You know, you have a different sensor. You have one sensor -- it can be looking at the same parameter, but they're physically different sensors.

MR. CHANCE: Oh, I don't mean just in terms of their -- oh, I see what you're saying. There's no other characteristics of the meter and the sensor but there's also the -- yeah.

MR. BOCKHOLD: The whole instrument changed, it's different.

MR. WYCKOFF: You calibrate the transducer, so -- it is a transducer, I guess? We're talking about transducers.

MR. BOCKHOLD: For -- it's a pressure switch or a temperature switch.

MR. WYCKOFF: And that you calibrate.

MR. KENDALL: As opposed to an electronic sensor that then sends a signal that's going to go to trip logic and the enunciator and to whatever else, it's -- this switch goes and provides a signal to the trip logic and here it would to the meter. So they're physically --

MR. WYCKOFF: I guess what I was talking about --

I'm not trying to get into, you know, high speed transducer on the key intelligence areas --

MR. KENDALL: Another way to phrase it is reading the indicator will not give you any indication of the performance of the switch.

MR. WYCKOFF: Right.

MR. CHANCE: My understanding, and correct me if I'm wrong about this, Paul, is that all of the parameters we're monitoring, we're monitoring the gauges which indicate the parameters, but we're also monitoring the enunciators which are indicating the output of the bistable switch. So we're basically covered on both sides for most of the parameters. Additionally, our whole plan of attack --

MR. CHANCE: Don't -- the switches for the enunciator is not necessarily the same switch as for the trip. They have different set points.

MR. HOLMES: The sensors would be common, the switches would be different.

MR. CHANCE: Right.

MR. BOCKHOLD: Not necessarily.

MR. KOCHERY: It's different. The sensor is common. For example, jacket water pressure is a line jacket water pressure and the other one is pneumatic. Putting the pressure switch -- I mean monitoring on the pneumatic line, I think we will be finding that we're monitoring the logic

test and these other tests, by doing these under-voltage tests and connecting all these things, they're breaking into a lot of lines and it's not really proving that much things. We have to do logic testing, whether we do under-voltage or not. The under-voltage test tells you yes, you've got a -- this particular sensor tripped, that's all we can tell. Why it tripped and all those things will be analyzed when we do a logic test and these other tests.

MR. KENDALL: Another thing, if you were to break into the air line in some way, you'd have to be very careful how you did it so that you wouldn't change the system from the way it was.

MR. KOCHERY: That's correct.

MR. CHAFFEE: I understand. It's not so much that I'm strongly trying to propose that you do this, I'm trying to understand the limitations of the test.

MR. KOCHERY: Yes, that's right, there's lots of limitations.

MR. CHANCE: We understood that but we wanted to minimize the impact of hooking up the test to the diesel generator itself.

The test itself is fairly straight-forward after hooking up the A channel recorder we're going to use and the selection of the cameras. We're basically going to instrument the diesel, the test equipment, we're going to go

down to the switch gear and simulate a UV down there. This will cause the sequencer to shed the bus and basically causing a real loss of off-site power for that particular bus. We expect the diesel generator to start and sequence the loads on. We'll have our monitoring equipment installed, you know, watching all the parameters on the gauges at the same time which enunciators come in, this sort of thing. We're going to run the diesel generator for 15 minutes taking data. When we're done, we'll secure the diesel generator. We anticipate using the output from the cameras to know which alarm came in first and what the different parameters were at the time.

Without -- the thing we like about the cameras is the fact that it gives us a lot of information, a lot of data without making any threat to the integrity of the system, that's what we were concerned about. We felt if we went in there and instrumented each and every parameter, that we may affect the system with our test hookup. There was a possibility of that.

MR. KENDALL: Is this test essentially identical to the UV test?

MR. CHANCE: The test is not identical but it's very, very similar. The only difference is with the other test we ran in the containment cooling units and they start -- on an LSP, they start on high speed. We're planning to

do the ILRT and we're pumping up to containment. When you get a high pressure in containment, the density there increases. When you do that, the containment cooling units are not to be operated at high speed because they'll draw too much current, so we've basically removed them from the test, but it doesn't have a significant impact on it.

MR. KENDALL: So the only difference is you have a couple of loads that aren't going to be sequenced?

MR. CHANCE: That's it, that's the only difference. Aside from that, they're identical.

MR. CHAFFEE: Does the loading of the diesel at the sequencer -- if you were to do it differently, does the diesel itself behave differently, are the loads large enough so that when it loads down you can hear the frequency change or do the frequency characteristics change in any way?

MR. CHANCE: The governor basically controls the fuel input to the diesel to determine what sort of load it can carry.

MR. KOCHERY: But the frequency dips every time.

MR. CHANCE: It dips slightly but it does recover.

MR. CHAFFEE: But if what's true then is that the frequency does dip so that also means that the speed with which your lube oil pump is also changing as a function of that, the speed of your --

MR. KOCHERY: We are talking about very little

difference.

MR. CHANCE: Typically speaking, when you sequence on a load on the diesel generator, your frequency will be running right at 60 hertz, when it dips, it dips and comes back in quarter of a second or less. It's just a very, very small dip.

MR. CHAFFEE: Are you satisfied that those variations wouldn't --

MR. CHANCE: On a short span of ten hertz like this, you're just barely able to see it.

MR. HOLMES: There's another reason that we don't think the loading is that important. The second time the diesel started and tripped, all the equipment on that bus had been placed in total lock by the operator with the exception of the NSCW pump, so there was really very limited load on that diesel the second time it started and tripped.

MR. CHAFFEE: And it still tripped.

MR. CHANCE: Any further questions?

MR. CHAFFEE: I had one but I forgot it.

MR. HOLMES: Okay, after we do the UV test, the next thing that we would like to go into is to look at the air logic system inside the engine control panel and there's a procedure and that has been done as a part of post-maintenance testing but we feel we probably ought to go back and look at that because again that's another potential. We

can't exclude it but yet we can't point our finger and say we ought to go do that first either. So we think the logical sequence is to try to recreate the scenario and then start into systematically looking at each of the major components, and the air logic being that part that ties all of the air lines together and we've been talking about this 90 second delay, part of the air locking system is that 90 second delay I believe.

Ken, are you going to talk about the logic test?

MR. BURR: Yes. I'm Ken Burr, I'm the senior project engineer out of Birmingham corporate office. I was asked to talk abou the logic testing that we're going to be doing.

Basically what we're going to do is block the air solenoids from starting, open the link so they can't start, some other signals we have to block, and set it up so that we can go through the logic without actually starting the engine. We'll do a start logic, we'll then trip it by venting one of the sensors, bleed the air off and verify that it shuts down. We'll restart, revent it, restart and go through every one of the sensors and every one of the starts and see if we can find a problem.

We can simulate a slow leak off or we can open it rapidly. We can do a lot of things there to try and find a problem, a malfunction any place. That's basically what

we're going to do.

MR. CHAFFEE: I guess you've already gone about and tested the individual sensors, it sounds like you did that lube oil pressure and calibration of all the sensors themselves.

MR. BURR: We are going to do that again. One of the next steps is to go out and recheck those sensors again to check calibration on them again. And we're also going to do that.

MR. WYCKOFF: I have one minor suggestion. You ought to have the Delavel owners' group try to develop a digital system for this to replace it.

MR. BURR: That's also a thought, yes. Any other questions.

MR. WYCKOFF: That's not a recommendation though.

MR. KENDALL: I've got one, Ken. In the tests of the logic board and all this stuff that runs on air, have there been tests to verify air purity or quality?

MR. BURR: Yes, we take the dew point of the air receivers, that's one of the requirements that we have checked, and make sure that the dew point is down low enough so we don't have any moisture problem.

MR. KENDALL: Does the dew point test by itself --

MR. BURR: No, we have to go out and do that.

MR. KENDALL: No, let me finish the question. Does

the dew point test by itself give a good indication of air quality and impurities and any problems you might have with the air in the pneumatic --

MR. BURR: The only real problems -- are you looking for damaged switches?

MR. KENDALL: Contaminants, whatever, I don't know that I'm smart enough to know all the problems with air systems, but impurities and contaminants and moisture and whatever else. Is that something that you're looking at as part of this testing scheme?

MR. BURR: The only one that I know of that we're doing is dew point testing.

MR. KENDALL: Is the dew point test.

MR. BURR: Yes.

MR. KENDALL: Okay, thank you.

MR. CHAFFEE: Has that been done?

MR. BURR: Yes.

MR. CHAFFEE: Since the event?

MR. BURR: Oh, I don't know. It was done after we repressurized the receiver after the outage and that's when you have the problem is when you initially pressurize the receiver.

MR. CHAFFEE: Okay.

MR. WYCKOFF: I presume you're not seen dirt in the air?

MR. BURR: No.

MR. KENDALL: Ken, another question we had was did the 36 month test and inspections include filter replacements or checking of filters in the air lines, that type of thing?

MR. BURR: I was not here for that, so I don't know. Paul, do you know, or Ray?

VOICE: I think they did.

MR. KENDALL: You think they did. We'll talk to other people and we can ask that.

MR. BURR: Okay. Anything else?

(No response.)

MR. BURR: Thank you.

MR. HOLMES: After the logic board testing and really in conjunction with the logic board testing, there are some things we can do and some things we can't do. Some sensors we can test and others we can't test while we're doing logic board testing, so logic board testing and sensor testing will overlap to some extent.

And just to briefly go over the sensors that we intend to go back and look at would be the high lube oil temperature, the high jacket water temperature, the low turbo oil pressure, the high evaporation, high crankcase pressure, low jacket water pressure, low lube oil pressure. Those are basically the non-emergency trips that we would go

back and look at and we'll do that through our work order process and control our work that way.

Sequencer DCP, there's a procedure for that. We can review that. Again that's just a fairly quick test of the -- to check the function of the reset switch and the associated relay that we put in the sequencer.

The bubbler test again is where we disconnect the switches at the logic control panel and actually put air to pressurize the lines now to see if a bleed off path were to cause the trip to be there and stay there even after the reset were to occur.

Then we'll do some more testing from the logic control panel to complete that up and then end up with a UV test and then surveillance.

We do have the temporary engineering procedure 9-11 to conduct the UV test and I think I brought enough copies, the four copies for y'all and I think Mike is ready to sit down and talk about that because we believe once you understand the status of the diesel and what we want to go do, we believe that's the next step in trying to return A diesel to operability.

MR. KENDALL: I've got a question. Can you go into a little bit more what the multiple start UV testing is?

MR. HOLMES: Ken.

MR. BURR: We're going to simulate an OSP in the

diesel, start it and we're going to trip it by venting one of the sensors. What we'll do is simulate an SI start and do a trip with the sensor to a normal start and do a trip.

MR. KENDALL: Okay, do you vent different sensors each time?

MR. BURR: Yes, different sensors each time.

MR. KENDALL: Thank you.

MR. CHAFFEE: Will you then in the process go through all the sensors?

MR. BURR: No, we're not going through each individual one.

MR. KENDALL: This is more to check the starts on the different signals?

MR. BURR: We want to make sure -- we went through the logic on the board without starting the engine and it tripped. Now we want to pick a few of them and actually go through starts and trips on the whole engine, everything, with sensors and all that.

MR. HOLMES: This logic board test will test the smaller part of each individual sensor that depressurizes the call control air will be tested here in the logic test, but the engine will not be running and trip. The engine itself is tested when we go down here and do these multiple starts. We basically just test the normal starts, the UV starts, the loss of off-site power and the SI. And so we

look at it as a group -- as those groups when they come in the logic board, we'll vent that group of sensors off to watch the diesel trip.

In this case we're looking at the smaller pieces, here we're looking at the larger combination of the trips for an actual running diesel and watch the diesel trip.

MR. CHAFFEE: So it sounds like you're satisfied that this is a comprehensive test and if the problem is still there -- that's a bad question -- this is as comprehensive as you can make it.

MR. HOLMES: Yes, we believe it is as comprehensive a test as we can make it to try to identify the root cause of the problem. We'll be looking -- first of all we'll try to recreate the situation, then we'll go and look at the sensors, we'll look at the logic, we'll look at the lines, we'll look at the integrated tests of starting and stopping and tripping and then we'll go back and do another UV test to see if we created another problem for ourselves.

I hope I don't have to come back up here and tell you we found nothing.

MR. CHAFFEE: As far as the air quality that's in the pneumatics, is there any way to get a handle on whether or not that contributed to this intermittent problem? I understand that you do tests to make sure it's not a problem, but like was there a test taken on the air before

the event, has one been taken after the event, is there any difference in those? Is there anything like that that can be done to try to determine if somehow you had a fluke, some debris or moisture or something that maybe was there at the time that is gone now and that's why -- you know what I'm saying?

MR. BURR: We can probably get dew point readings.

MR. CHAFFEE: I don't know when your last dew point was, I don't know if it was --

MR. BOCKHOLD: We'll go ahead and take the action to go ahead and go to our logs and find out what the last dew point was, when it was and we'll take a dew point, we'll add that into some parallel path in the testing modes. We've got plenty of time to get a dew point.

MR. HOLMES: You're also asking about air quality.

MR. CHAFFEE: From what I can tell, it sounds like you're come up with about every test possible if the thing is there to find it. So now the only thing I can think of is how can you figure out if there's something intermittent. The only thing I can think of that's intermittent is maybe some sort of poor air quality or debris that caused one of these sensors to act irregularly for a period of time and then somehow in testing the diesel it's gone away. So maybe there's some way to go back and find out that maybe that was the case. But I don't know how to do that.

That's the only thing I can think of.

MR. BOCKHOLD: We'll go look at it. We can get out the INPO guidelines on instrument air systems and see what other kind of tests that we have been running on instrument air systems or if we can come up with the same testing that we do for normal plant instrument air systems, we may be able to do it for a section of the diesel.

MR. KENDALL: I think we'd like to know what test on the air system is routinely done for the diesel start system.

MR. BOCKHOLD: We'll take that action, we'll go do that and then we'll go run a battery of tests on the air system for the diesel.

MR. KENDALL: Ken, I have one more question. On the logic board test and the sensor testing, is the extent of the testing that's going to be done on the A diesel generator now in this plan, is it essentially identical to what was done during the 36 month inspection and testing?

MR. KOCHERY: No.

MR. HOLMES: I believe that the logic board testing would be very similar to what was done post-maintenance.

MR. KOCHERY: If you look at the procedure we marked there, you'll see some of them on the schedule. The marked up version of the procedure. Basically all the trips will be looked at.

IIT DGIA MEETING

*AGENDA DISCUSSION

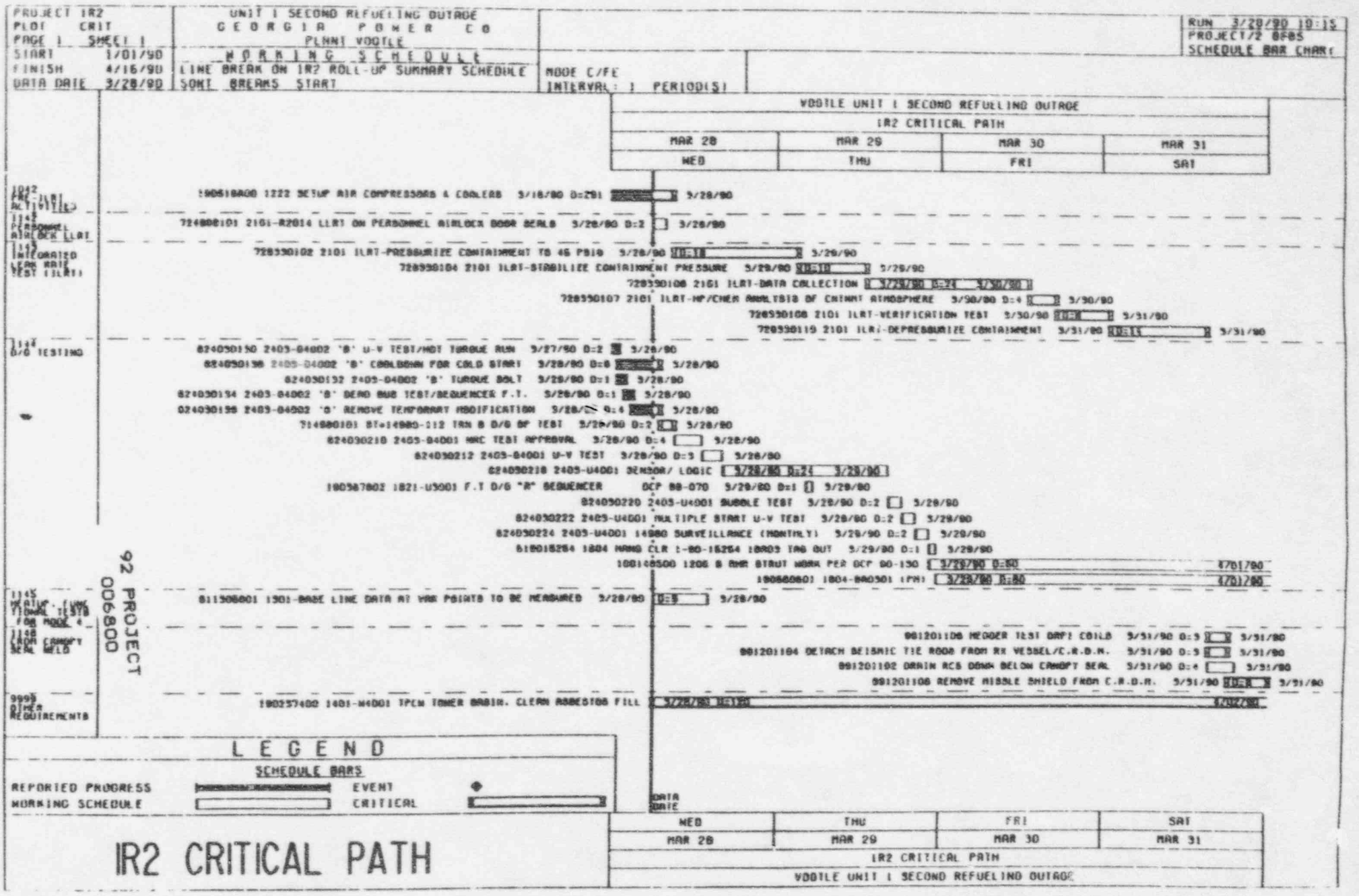
*DG ENGINE OVERVIEW 30 min Rick Bugdon
- MAJOR SUBSYSTEMS
- TRIPS
  - NORMAL
  - EMERGENCY
- AIR LOGIC

*SEQUENCER OVERVIEW 15 min Steve Wilkinson
- FUNCTION
- MAJOR COMPONENTS
- UV LOGIC

*SUMMARY OF OUTAGE ACTIVITIES MLB

*TEST SEQUENCE KRH
- OVERVIEW (P2 SCHEDULE)
- UV TEST (T-ENG-90-11)
- LOGIC BOARD TEST
- SENSOR TESTING
- SEQUENCER DCP FT
- BUBBLER TEST
- MULTIPLE START UV TESTING
- UV TEST
- SURVEILLANCE

92 PROJECT
006801



IR2 CRITICAL PATH

Final - Presented 4/2/90
8:45 AM

DRAFT

ROOT CAUSE - 1A Diesel Shutdown

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)

	1987	1988	1989
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

92 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-4749C	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

92 PROJECT
046041

MWO #	DATE	D/G	SENSOR	COMMENTS
19000016	01/04/90	1B	1PSL-4859E Rt Bank Lo Turbo Oil Press	Found switch venting - replac
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	Post Event Investigation found A switch would not rese replaced all 3
			1PSL-19114 Lo JW Press	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	19117 and 19 were replaced - 18 recaled
			1TSH-19153 Hi Temp LO	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	Cal checked - OK
			1TSH-19146 Hi Temp LO	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

UNIT TWO D/G TRIP SENSOR HISTORY (SUMMARY)

MWO #	DATE	D/G	SENSOR	COMMENTS
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 - recald
28800552	01/25/88	2A	2TSH-19146 Hi Temp	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 - recalibra
28819595	12/08/88	2A	2XS-4745B Turbo Hi Vibration	Switch malfunctioned and tripped engine - replaced

92 PROJECT
046043

CD-165-2E-

OFFICIAL TRANSCRIPT OF PROCEEDINGS

Agency: Nuclear Regulatory Commission

Title: Diesel Generator Meeting
Between NRC and Georgia Power

Docket No.

LOCATION: Waynesboro, Georgia

DATE: Monday, April 2, 1990 PAGES: 1 - 60

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92 PROJECT
035218

U. S. NUCLEAR REGULATORY COMMISSION

DIESEL GENERATOR MEETING)
BETWEEN NRC AND GEORGIA POWER)

Main Conference Room
Administration Building
Vogtle Electric Generating Plant
Waynesboro, Georgia

Monday, April 2, 1990

The meeting commenced at 8:45 a.m.

92 PROJECT
035219

ATTENDEES:

AL CHAFFEE	TOM WEBB
WILLIAM LAZARUS	KENNETH BURR
ALAN HERDT	RAY HOWARD
KEN BROCKMAN	KENNETH HOLMES
RICK KENDALL	JIM ROBERTS
PAUL KOCHERY	JOSEPH D'AMICO
GEORGE BOCKHOLD	GEORGE FREDERICK
WARREN LYON	PHIL CUPP
PAUL DIETZ	MARK BRINEY
E. A. TRAGER	MICHAEL LACKEY
WILLIAM JONES	VINCE STEWART
HERB BEACHER	ERNEST TOUPIN
ROBERT JOHNSTON	ALLEN MOSBAUGH
DONALD PESOUT	MICHAEL HORTON
SHELDON OWYOUNG	JIMMY PAUL CASH
KENNETH STOKES	INDIRA KOCHERY
CHARLES COURSEY	

PROCEEDINGS

MR. CHAFFEE: It's April 2 and it's 8:45 in the morning and we're here -- this is the IIT at Vogtle and we're here to go over the information that exists at this time on the problem with the diesel generator relative to its tripping and what the troubleshooting has found and what the machinery history has reviewed that is relevant to what transpired in the event with the diesel generator tripping.

I don't know how we should do this. Do you just want to have somebody kind of run through what you guys' perception is on it?

MR. BOCKHOLD: You know, we, last night provided you a root cause that the critique team is -- you know, the diesel team came up with this root cause and some key lessons learned and recommendations and a statement about diesel reliability and our analysis of it.

I think the key lesson learned -- and we have the Calcon vendor on the way and he's supposed to be here today -- is to go through the calibration procedures so we can determine what is the best methodology for calibration. We have some ideas, I'm sure he'll have some ideas, and look at switch reliability. That's ongoing.

I don't know if you want me to read this for the record's sake or that kind of stuff or you ask specific questions about the history.

MR. JOHNSTON: You would have to do the emergency stop reset after the third stop. You couldn't do it before that.

MR. CHAFFEE: Oh, you can't do emergency reset until you've done an emergency start?

MR. JOHNSTON: Right.

MR. CHAFFEE: Oh, okay, and therefore, the scenario is that if the emergency start hadn't worked, they would have had to emergency reset to have been able to get this out or they would have found that they couldn't probably -- there's a possibility they wouldn't have been able to get it started with the fourth or subsequent ones, if they hadn't tried to do emergency reset.

Okay. Let's talk about the jacket water temperature sensors themselves and their reliability and what's possibly causing them to have problems. My guess is in looking at the history -- is there anybody here that can describe the history and what it sort of tends to suggest about reliability or what might be going wrong with these sensors?

MR. BOCKHOLD: Well the way we summarized it was, you know, we have problems, have had problems associated with these sensors during initial startup phases of the engine and during overhaul times, and we have not had problems in between overhaul periods of time. You know,

92 PROJECT
035232

being told and if that's true, then there's a discontinuity there that can maybe be used to figure out what's going on with these, I guess -- or maybe it makes me a little dubious that the monthly maintenances are as rigorous as you say, although I don't disbelieve what you're saying because it makes sense, operators tend to do that. Do you see the dilemma I find?

MR. BOCKHOLD: The -- you know, working with the vendor, we have some switches -- we received -- I think I told you we received a switch in that he calibrated on 3/24/90 and we received it in and part of the repair process is we recalibrated his switch and it failed. Okay, that switch is currently quarantined. We're going to take the vendor with his switch and try to figure out if there is some difference there, what the problem is.

But you know, the facts show that when we've come out of overhauls basically associated with engine runs around overhauls, we've had problems and we've replaced the switches and we've gotten good switches in that have run until the next overhaul. Those facts have shown that on the four engines.

MR. CHAFFEE: Have you ever had either of the units, when you've done your monthly surveillances, an occurrence where the diesel was tripped, you know, for an unexplained reason? I guess you've had in Unit 2 recently?

92 PROJECT
035236

257-D

OFFICIAL TRANSCRIPT OF PROCEEDINGS

Agency: Nuclear Regulatory Commission

Title: IIT Teleconference

Docket No.

LOCATION:

DATE: April 3, 1990 PAGES: 1 - 74

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92 PROJECT
035459

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A CLIENT-FURNISHED, UNMONITORED TAPE RECORDING

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92 PROJECT
035460

VOICE: Hello. George [inaudible,] Plant Vogtle.

VOICE: Can you hear me, George?

VOICE: [Inaudible.] Also, we're supposed to be [inaudible.] I'm going to put you on [inaudible] just a second.

VOICE: [Inaudible.] We don't know who else is [inaudible.]

VOICE: George [inaudible,] Plant Vogtle, and our whole diesel team, including the resident, [inaudible.]

VOICE: Okay. George, can you hear Region II okay?

VOICE: I hear Region II great.

VOICE: Okay. This is Al [inaudible.] [Inaudible.] [Inaudible.]

VOICE: Okay. What this call was for was to discuss your plans for troubleshooting these quarantined sensors. I understand you have Calcon on site?

VOICE: That's correct.

VOICE: So I guess at this point, I guess what we'd like to hear is what are you planning in terms of dealing with those sensors, and then we'll want to hash it around and see if we're all in agreement or if there are other ideas that need to be considered.

Gary or Calcon [inaudible,] but we'll let him speak first and we'll talk about [inaudible.]

92 PROJECT
035461

just said, that you seem to be finding a number of cases where the switches aren't behaving consistent with the calibration that was --

VOICE: [Inaudible] associated with overhauls. We haven't found this problem after -- and pretty much when we came out of overhaul, we have all new switches in the engines.

VOICE: I mean, basically most -- pretty much all of your -- the majority, if not all of the calibrations of these switches have been done as part of the overhaul.

VOICE: Yes.

VOICE: Okay.

VOICE: When we manipulate the switches and that kind of stuff, it appears that for some reason we get different types of failure modes on the switches and we end up putting in new switches and calibrating them and they run great in between the overhauls.

VOICE: Have you run into this type of experience anyplace else in the country?

VOICE: You talking to me?

VOICE: Yeah, the Calcon -- what's your name?

VOICE: Gary.

VOICE: Gary?

VOICE: No, I haven't. The only thing I can think is because they said they were leaking, because they just

VOICE: And as far as diesel generator being operable, I don't know if it's operable or not. The reason I say that is that in the case of the A diesel, the licensee had gone through testing the diesel and it included [inaudible] the event occurred.

So their testing process that they used prior to the event was not comprehensive enough to prevent what happened in the event, so there is some question in terms of how comprehensive their testing is in this case.

Although, I do have to admit what George [inaudible] is saying has some merit. It does seem as though, based on the history, that eventually whatever is causing these things to trip seems to work themselves out. They eventually worked themselves out and they tell us, we haven't verified it yet, that their monthly surveillances on the diesels go without problem. Again, we haven't verified that yet, but that's what they tell us.

So it's possible -- it's possible that the diesel, the one A diesel right now, that the problems are all worked out and that it would be able to perform its function. But not knowing exactly what's causing it yet and recognizing that the past testing they did is not fully comprehensive, that does leave some doubt.

The other thing that's true is that as far as the testing they've done, most of that testing has been done not

IIT DOCUMENT NO. 168-10-90

OFFICIAL TRANSCRIPT OF PROCEEDINGS

Agency: Nuclear Regulatory Commission

Title: Teleconference Between IIT, Licensee Personnel, and Region II Personnel

Docket No.

LOCATION: Bethesda, Maryland

DATE: Wednesday, April 4, 1990 PAGES: 1 - 67

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

- -X

In the matter of: :

TELECONFERENCE BETWEEN IIT, :

LICENSEE PERSONNEL, AND REGION II :

PERSONNEL :

- -X

Nuclear Regulatory Commission

7735 Old Georgetown Road

Conference Room

Bethesda, Maryland

Wednesday, April 4, 1990

The above-entitled matter commenced at 10:07 a.m., when were present:

ON BEHALF OF IIT:

RICK KENDALL

AL CHAFFEE

HARVEY WYCKOFF

ON BEHALF OF GEORGIA POWER (LICENSEE):

GEORGE BOCKHOLD

KEN McCOY

ON BEHALF OF REGION II:

KEN BROCKMAN

PROCEEDINGS

[10:07 a.m.]

MR. CHAFFEE: We're going to be transcribing this thing.

MR. BOCKHOLD: Al, as a separate issue, before we get to that, would you like a copy of the critique of Region II's response?

MR. CHAFFEE: Yes.

MR. BOCKHOLD: I will forward that on to you, to the fax number that I got yesterday.

MR. CHAFFEE: Okay.

Okay. Let's see. Where are we going to go with this?

A couple of things -- since we last talked -- maybe I should ask you guys first, George. Since we last talked, is there anything that you guys have done, from where you were yesterday, in terms of looking into the kind of troubleshooting you want to, that you want to talk to us about before we start giving you some of the thoughts that we have?

MR. BOCKHOLD: You want me to recap where I thought we left of yesterday?

MR. CHAFFEE: Okay. That's probably a good start.

MR. BOCKHOLD: Okay. Yes. We talked about a center calibration yesterday, and we told you we would send

indicates our engines are at least as reliable as the rest of the engines in the industry in recent times. So, we've got to address that issue.

The switches -- you know, one thing that was different at Vogel was that these switches were in the circuits during under-voltage, and we are taking --

MR. BOCKHOLD: The thing that's different at Vogel is we have a two-out-of three logic on these switches and some other people only have a one-out-of-one logic on some of the switches at their particular plants.

MR. CHAFFEE: Right. But in this case at this plant --

MR. BOCKHOLD: The overall reliability of Plant Vogel's engine -- we meet the blackout rule for the higher classification of diesels. We have the 95 percent or 95 times out of 100, our engines will start and load and perform satisfactorily. So, we meet the highest classification on the blackout rule.

These switches -- we've had trouble at overhaul times, but during normal plant operation and in between overhaul times, the switches have been reliable.

MR. CHAFFEE: Right. But your monthly test may not be valid.

MR. BOCKHOLD: The monthly test is valid that the engine will start and run and appropriately come up to speed

05-200-E-9C

OFFICIAL TRANSCRIPT OF PROCEEDINGS

Agency: Nuclear Regulatory Commission

Title: Telephone Conference: IIT, Licensee, Region II (CLOSED)

Docket No.

LOCATION: Bethesda, Maryland

DATE: Thursday, April 5, 1990 PAGES: 1 - 37

ANN RILEY & ASSOCIATES, LTD.
1612 K St. N.W., Suite 300
Washington, D.C. 20006
(202) 293-3950

92 PROJECT
035280

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

- - - - - - - - - - - - - - - - - -X

In the Matter of: :

INVESTIGATIVE INTERVIEW :

Telephone Conference: IIT, :

Licensee, Region II :

(CLOSED) :

- - - - - - - - - - - - - - - - - -X

Nuclear Regulatory Commission

Operations Center

7735 Old Georgetown Road

Bethesda, Maryland

Thursday, April 5, 1990

The above-entitled matter commenced at 10:03 o'clock a.m., when were present:

Alfred Chaffee, IIT Leader

Ken Brochman, NRC Region II

Rick Kendall, NRC

Nuclear Regulatory Commission

Ken Burr, Vogtle

92 PROJECT
035281

Mike Horton, Vogtle

John Auftenkampe, Vogtle

Paul Kochery, Vogtle

Alan Mosba

92 PROJECT
035282

PROCEEDINGS

[10:03 a.m.]

MR. CHAFFEE: Mr. Sheibani.

MR. SHEIBANI: My name is Mehdi, M-E-H-D-I, Sheibani, S-H-E-I-B-A-N-I.

MR. CHAFFEE: Mr. Sheibani, just a couple minutes here before we go into the diesel thing. This morning we sat down in our group there -- Region II, did you just get on the line?

MR. BROCHMAN: This is Ken Brochman.

MR. CHAFFEE: This is Al Chaffee. We have a number of people from the licensee. Why don't the licensee people, why don't you run through again who all is there so that Ken can hear that.

MR. AUFTENKAMPE: This is John Auftenkampe. There may be some other people that come in as we go on with this.

MR. CHAFFEE: Before we start talking about the diesels, I had an administrative thing which is really for Mehdi Sheibani. That is, we went through this morning a listing of the documents we have asked for and where we think we are in terms of getting them. We are going to look at it a little more closely so that tomorrow in the 10:00 o'clock call we can also help focus on those documents that we haven't yet received that we have the highest priority on.

92 PROJECT
035283

temperature we saw was 170. The next question would be why did the trip occur? Let me ask another question.

At this point, my understanding is that your best projection in terms of what caused the trip was the trip on high jacket water temperature sensors, and that is because you were able to reproduce the annunciation that existed at the time of the second trip by simulating a high jacket water temperature trip condition; is that right?

MR. BOCKHOLD: Yes. This is George again.

MR. CHAFFEE: George, we were just trying to work through the thinking process. Let's assume that when all is done here it turns out that the max temperature that these sensors are going to see in the start and one of the fellows proposes to use 170 degrees because that's the max temperature that they seen in the lube oil cooler. The next discussion was, let's go back and figure out that if that's what it turns out to be, if it's only 170 degrees -- we said the second trip at this point, the belief is that the second trip of the diesel during the event was caused by high jacket water temperature trip.

That is because you were able to reproduce the annunciations that occurred on that second trip by simulating a trip on high jacket water temperature. I guess what is true at this point is -- I am not sure if everybody wants to say that the fact caused it, but it's the most

likely cause of the trip?

MR. BOCKHOLD: We said it is the most probable cause.

MR. CHAFFEE: The next thing we say is, if the highest temperature that those sensors should have seen in the event was 170 degrees but they actually caused the trip. The next question is, how do we account for that. What could have caused them to trip if they only saw a temperature of 170 degrees?

I guess what is true in theory, they were set for something about 200 degrees and we need to come up with a rationale for this 30 degree difference between the set point and the actual temperature. The question is, how do we account for that, what could have happened? If it turns out that the rate of temperature change is not an explanation for that difference, then what is there left that can be pursued in terms of trying to understand why these sensors caused the diesel to trip.

MR. BOCKHOLD: What we have to do is, we have to test the probes which are currently under quarantine. What I was going to say associated with this conversation and really with some of our other conversations that we have had is, what we would propose is go get an independent lab -- I think we are looking at Wiley, but I don't think we decided on that independent lab.

92 PROJECT
035309

We collected all the quarantine pressure switches, we would get appropriate team of people, and if the NRC wanted to be part of that team it would be fine, or if you just want to look at the procedures that would be fine.

MR. CHAFFEE: Okay.

MR. BOCKHOLD: Let's take the quarantine switches and establish very detailed test programs and go and test the switches and see if we could get the answer to your question. Basically, that's where we are at. In fact, Louis Ward in our Birmingham Corporate Office has been assigned the lead on that. Basically, we plan to move this offsite to have Birmingham take the lead on determining or working with you all on these temperature switches.

MR. CHAFFEE: Sounds good. Do you have a phone number for him?

MR. BOCKHOLD: It's 205-877-7802, Louis Ward.

MR. CHAFFEE: Did I get that number correct; 205-877-7802?

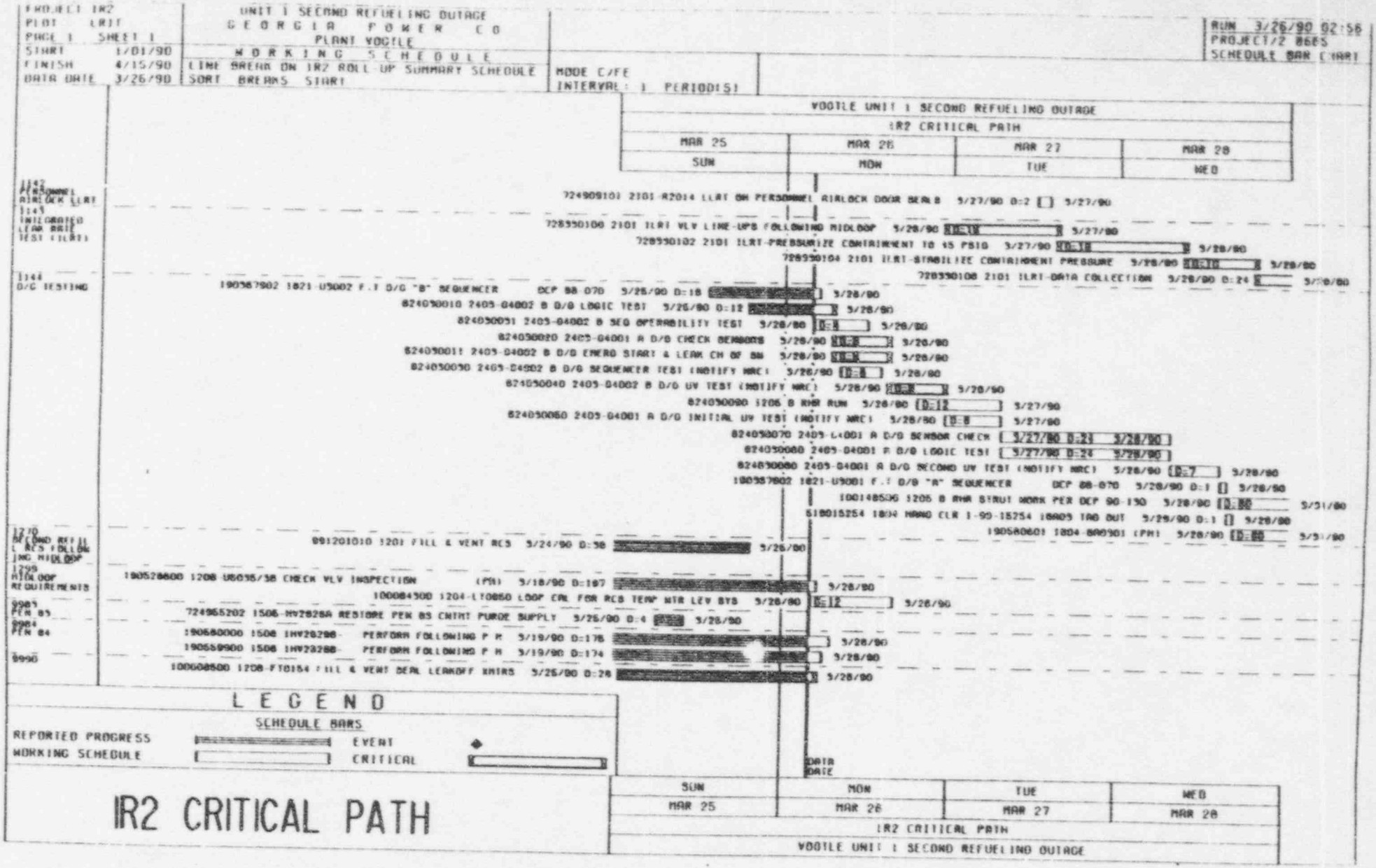
MR. BOCKHOLD: That is correct.

MR. CHAFFEE: Did you get any feeling from them in terms of what kind of timeframe this would all occur under?

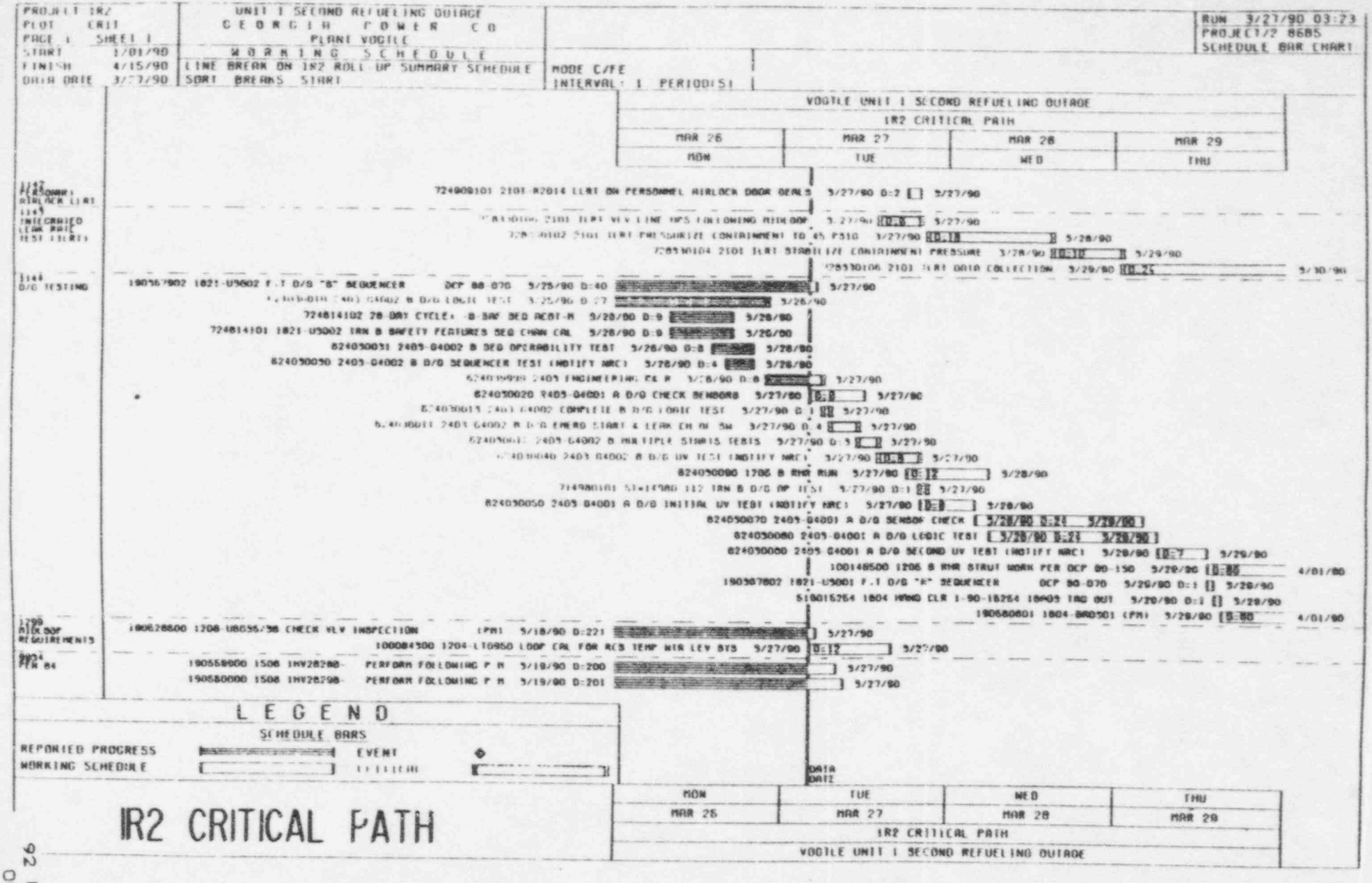
MR. BOCKHOLD: No, I didn't get any feeling. I believe that Louis got that assignment this morning, so he's off to work on his new assignment.

MR. CHAFFEE: We should just contact him directly?

92 PROJECT 035310

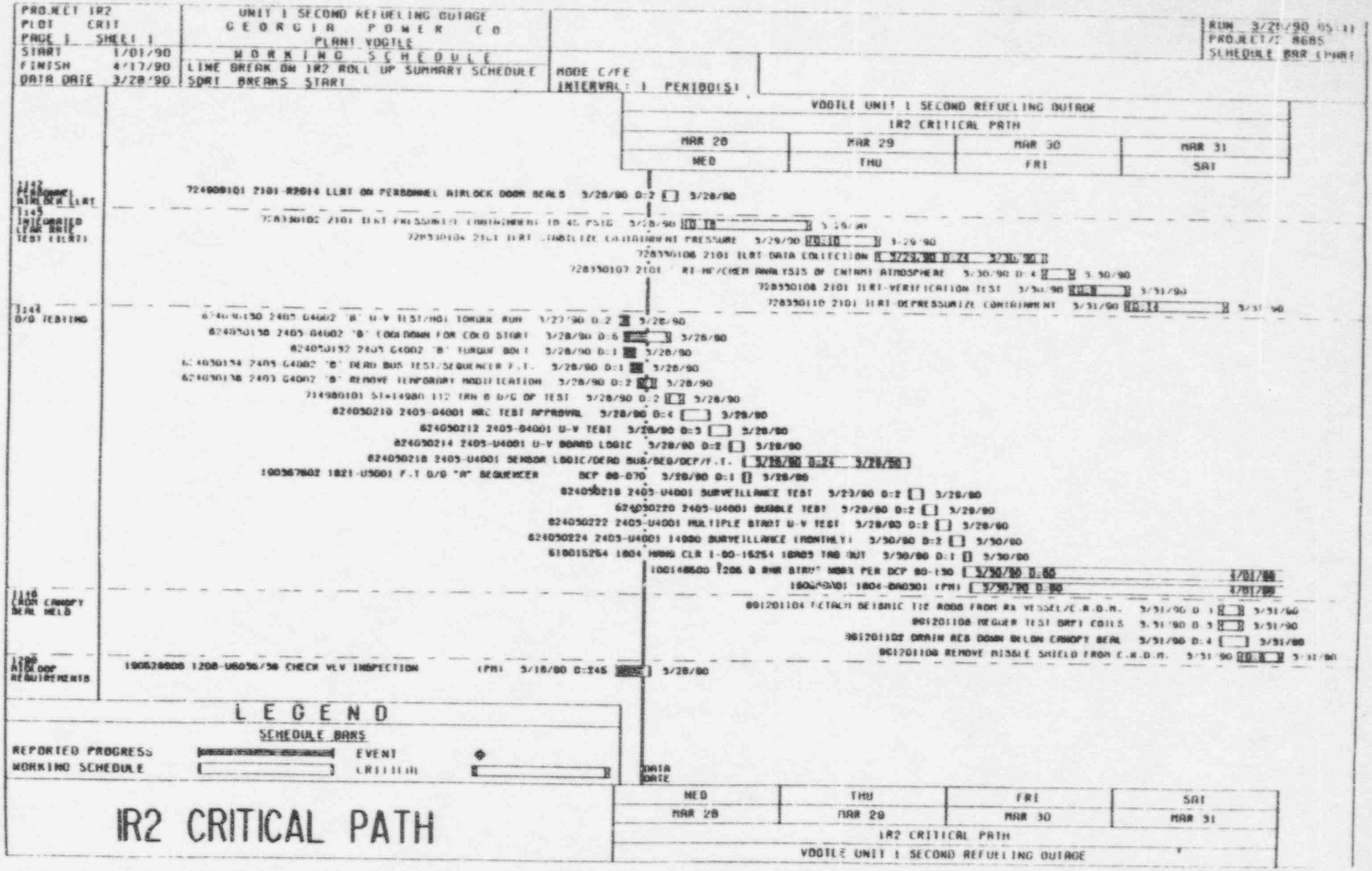


92 PROJECT
006844

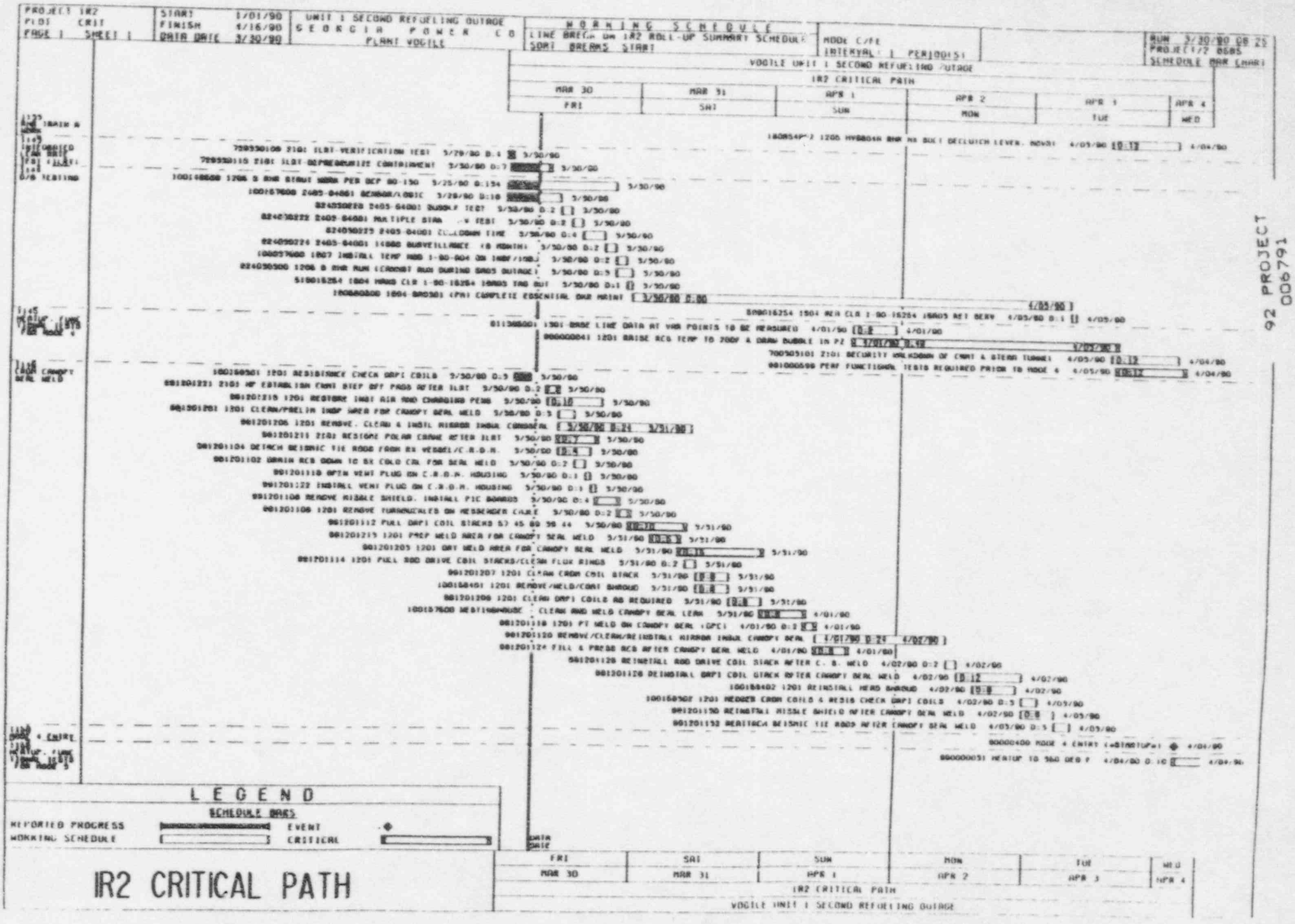


IR2 CRITICAL PATH

92 PROJECT 006857



PROJECT 92 IR2 006870


PROJECT IR2
PLOT CRIT
PAGE 1 SHEET 1
START 1/01/90
FINISH 4/16/90
DATA DATE 3/30/90
UNIT 1 SECOND REFUELING OUTAGE
GEORGIA POWER CO
PLANT VOGTLE
WORKING SCHEDULE
LINE BREAK ON IR2 ROLL-UP SUMMARY SCHEDULE
SORT BREAKS START
MODE C/FE
INTERVAL 1 PERIODS1
RUN 3/30/90 08:25
PROJECT 0685
SCHEDULE BAR CHART
VOGTLE UNIT 1 SECOND REFUELING OUTAGE
IR2 CRITICAL PATH
MAR 30 FRI
MAR 31 SAT
APR 1 SUN
APR 2 MON
APR 3 TUE
APR 4 WED
MAIN A
MODE 6 ENTRY
MODE 5 ENTRY
MODE 4 ENTRY
92 PROJECT
006791
LEGEND
SCHEDULE BARS
REPORTED PROGRESS
WORKING SCHEDULE
EVENT
CRITICAL
IR2 CRITICAL PATH
VOGTLE UNIT 1 SECOND REFUELING OUTAGE

PLOT IR2SMALL
PAGE 1/1 SHEET 1/4
START 1:00 MO
FINISH 23:00 SU
DATA DATE 23:00 SU

GEORGIA POWER CO
PLANT VOGTLE
WORKING SCHEDULE
LINE BREAK ON IR2 ROLL-UP SUMMARY SCHEDULE
SORT BREAKS START ANODES 0

MODE C/FE
INTERVAL: 1 PERIOD(S)

PROJECT/I 92A2
SCHEDULE BAR CHART

VOGTLE UNIT 1 SECOND REFUELING OUTAGE

MAR 23	MAR 24	MAR 25	MAR 26	MAR 27	MAR 28	MAR 29	MAR 30	MAR 31	APR 1	APR 2
FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON

1132 RHR TRAIN B PUMP WORK
1133 RHR TRAIN A WORK
1140 COMPLETE REASSEMBLING RE ACTOR VESSEL
1142 PERSONNEL AIRLOCK LLRT
1143 INTEGRATED LEAK RATE TEST (ILRT)
1144 D/G TESTING /B TRN BRK MAINT

1R2 AS-BUILT SCHEDULE

LEGEND

SCHEDULE BARS

REPORTED PROGRESS
WORKING SCHEDULE
EVENT
CRITICAL

FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON
MAR 23	MAR 24	MAR 25	MAR 26	MAR 27	MAR 28	MAR 29	MAR 30	MAR 31	APR 1	APR 2

VOGTLE UNIT 1 SECOND REFUELING OUTAGE

PROJECT IR2
PLOT IR2SMALL
PAGE 1/1 SHEET 2/4

RUN 8:39 TH 08:58
PROJECT/2 92A2
SCHEDULE BAR CHART

VOGTLE UNIT 1 SECOND REFUELING OUTAGE

MAR 23	MAR 24	MAR 25	MAR 26	MAR 27	MAR 28	MAR 29	MAR 30	MAR 31	APR 1	APR 2
FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON

1144
C/O TESTING /B TRN BRK MAINT

190367802 1821-U3001 P.T D/B "A" SEQUENCER DCP 86-070 13:00 TH 0=1 14:00 TH
100187600 2403-84001 SENSOR/LOGIC 18:00 TH 0=41 6:00 SU
190043700 1805 53805 480V SWITCHGEAR LATCHING LEVER BROKEN 0:00 FR 0=5 5:00 FR
190329001 2403 FT LUBE OIL PRESSURE SWITCHES DCP 88-067 7:00 FR 0=5 12:00 FR
100187701 2403 REPLACE 1A D/G TURBO LUBE OIL PRESS SWS 18:00 FR 0=3 18:00 FR
824030220 2403-84001 BUBBLE TEST 18:00 FR 0=5 23:00 FR
824030301 2402 FILM & D/G STARTS WITH AIR COMP ISOLATED 0:00 SA 0=1 1:00 SA
100188300 2403-TSH10112 RECEIVE MCW TEMP SWITCHES 1:00 SA 0=10 11:00 SA
100186301 2403-TSH10112 CALIBRATE MCW SWITCHES 11:00 SA 0=11 22:00 SA
824030303 2403-84001 JKT WTR TRIP TEST 17:00 SA 0=1 18:00 SA
100186302 2403-TSH10112 INSTALL MCW SWITCHES 18:00 SA 0=4 22:00 SA
824030203 2403 BRIEF RCO PRIOR TO VOLT START 6-V TEST 22:00 SA 0=1 23:00 SA
824030222 2403-84001 MULTIPLE START 6-V TEST 23:00 SA 0=2 1:00 SU
824030302 2403-84001 BUBBLE TEST 23:00 SA 0=1 0:00 SU
824030213 2403-84001 COOLDOWN TIME 1:00 SU 0=4 5:00 SU
824030224 2403-84001 14060 SURVEILLANCE (6 MONTH) 5:00 SU 0=6 11:00 SU
100037800 1007 INSTALL TEMP MOD 1-80-004 ON MBP/MDJ 11:00 SU 0=2 13:00 SU
519018254 1004 MOMO CLR 1-80-18254 19003 TRO OUT 13:00 SU 0=3 16:00 SU
100466600 1904-84030I (PM) COMPLETE ESSENTIAL AIR MAINT 16:00 SU 0=30 7:00 TU
190561100 1805-880701 (PM) 16:00 SU 0=37 8:00 TU
190569000 1804-81A03 4160V SWGR 1BN03 PM 0:00 MO 0=17 17:00 MO

1145
HEATUP. FUNCTIONAL TESTS FOR MODE 4

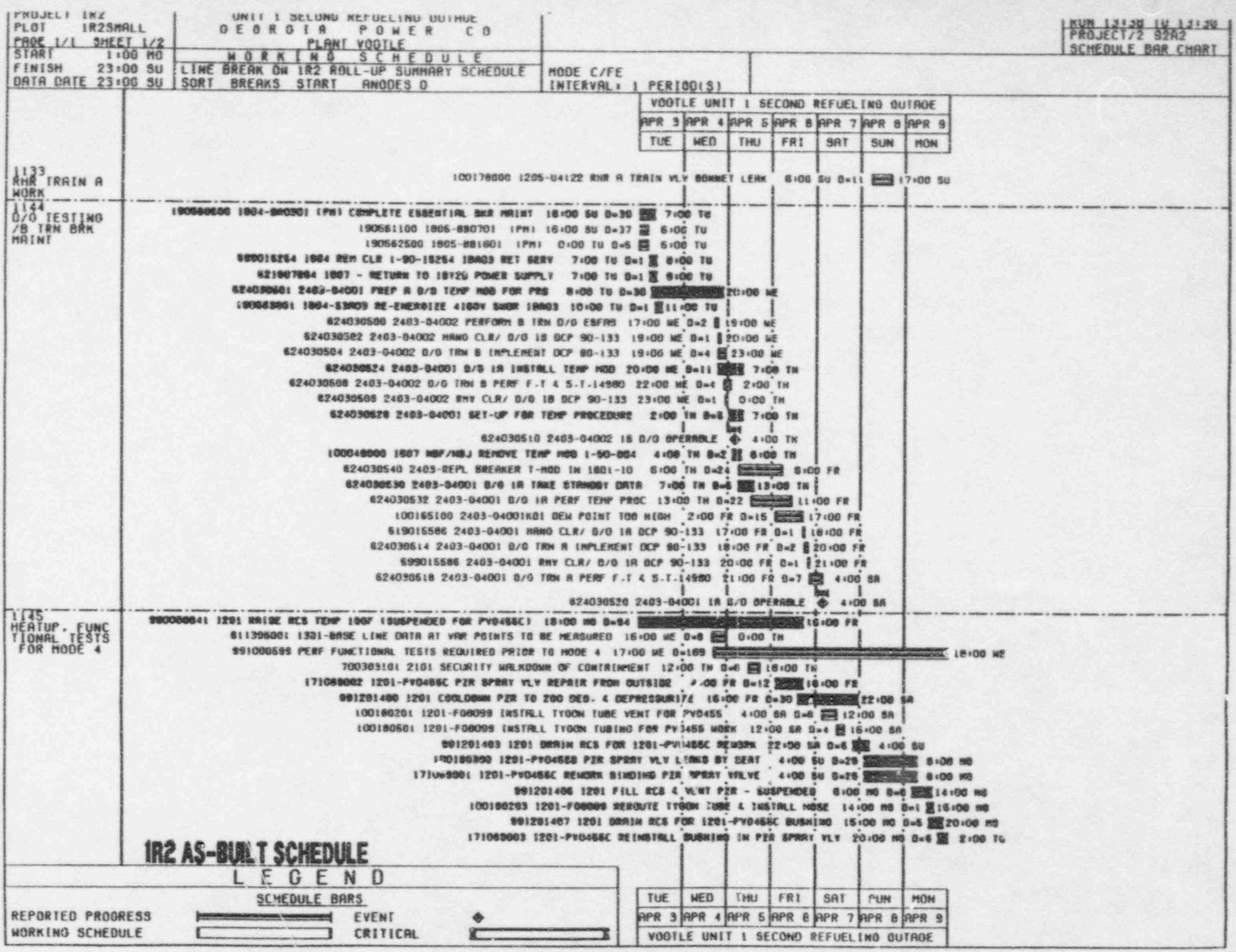
824030802 1201 THERMAL EXPANSION MEASUREMENT PRIOR TO HEATUP 17:00 MO 0=1 18:00 MO
980000804 1201 RAISE RCS TEMP 180F (SUSPENDED FOR PV0456C) 18:00 MO 0=34 18:00 FR

1148
CROM CANOPY SEAL WELD

981201100 REMOVE C.R.D.M. HEAD SHROUD 13:00 TU 0=4 17:00 TU
100188301 1201 RESISTANCE CHECK DRPI COILS 2:00 FR 0=3 8:00 FR
981201210 1201 RESTORE INST AIR, CHRG. SEAL INJ PENS 8:00 FR 0=21 8:00 SA
981201221 2101 HP ESTABLISH CHNT STEP OFF PADS AFTER ILRT 8:00 FR 0=2 10:00 FR
981201104 DETACH SEISMIC TIE RODS FROM RX VESSEL/C.R.D.M. 10:00 FR 0=7 17:00 FR
981201201 1201 CLEAN/PRELIM INSP AREA FOR CANOPY SEAL WELD 10:00 FR 0=2 12:00 FR
981201206 1201 REMOVE, CLEAN & INSTL MIRROR INSUL CONOSEAL 10:00 FR 0=17 3:00 SA
981201211 2101 RESTORE POLAR CRANE AFTER ILRT 10:00 FR 0=6 16:00 FR
981201106 REMOVE MIDDLE SHIELD, INSTALL PIC BOARDS 16:00 FR 0=1 17:00 FR
981201109 1201 REMOVE TURNBUCKLES ON MISSENDER CABLE 17:00 FR 0=2 19:00 FR
981201102 DRAIN RCS DOWN TO RX COLD CAL FOR SEAL WELD 8:00 SA 0=6 13:00 SA
100188302 1201 MEGGER CROM COILS & MEAS CHECK DRPI COILS 7:00 SA 0=6 12:00 SA
981201110 OPEN VENT PLUG ON C.R.D.M. HOUSING 13:00 SA 0=3 16:00 SA
981201213 1201 PREP WELD AREA FOR CANOPY SEAL WELD 13:00 SA 0=6 18:00 SA
981201114 1201 PULL ROD DRIVE COIL STACKS/CLEAN FLUX RINGS 16:00 SA 0=28 16:00 SU
100186401 1201 REMOVE/WELD/CERT SHROUD 18:00 SA 0=12 6:00 SU
981201203 1201 DRY WELD AREA FOR CANOPY SEAL WELD 18:00 SA 0=17 11:00 SU
981201112 PULL DRPI COIL STACKS 37 45 58 39 44 13:00 SU 0=7 20:00 SU
981201118 1201 PT WELD ON CANOPY SEAL (OPC) 13:00 SU 0=1 14:00 SU
981201120 REMOVE/CLEAN/REINSTALL MIRROR INSUL CANOPY SEAL 14:00 SU 0=8 22:00 SU
981201122 INSTALL VENT PLUG ON C.R.D.M. HOUSING 16:00 SU 0=1 16:00 SU
100187600 WESTINGHOUSE - CLEAN AND WELD CANOPY SEAL LEAK 0:00 MO 0=5 5:00 MO
981201124 FILL & PRESS RCS AFTER CANOPY SEAL WELD 0:00 MO 0=5 5:00 MO

FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON
MAR 23	MAR 24	MAR 25	MAR 26	MAR 27	MAR 28	MAR 29	MAR 30	MAR 31	APR 1	APR 2

VOGTLE UNIT 1 SECOND REFUELING OUTAGE


PROJECT IR2
PLOT IR2SMALL
PAGE 1/1 SHEET 1/2
START 1:00 MO
FINISH 23:00 SU
DATA DATE 23:00 SU
UNIT 1 SECOND REFUELING OUTAGE
GEORGIA POWER CO
PLANT VOGTLE
WORKING SCHEDULE
LINE BREAK ON IR2 ROLL-UP SUMMARY SCHEDULE
SORT BREAKS START ANODES 0
MODE C/FE
INTERVAL= 1 PERIOD(S)
KVM 13:30 TV 13:30
PROJECT/2 92A2
SCHEDULE BAR CHART
VOGTLE UNIT 1 SECOND REFUELING OUTAGE
APR 3 TUE
APR 4 WED
APR 5 THU
APR 6 FRI
APR 7 SAT
APR 8 SUN
APR 9 MON
1133 RHR TRAIN A WORK
1144 D/G TESTING /B TRN BRK MAINT
1145 HEATUP, FUNCTIONAL TESTS FOR MODE 4
1R2 AS-BUILT SCHEDULE
LEGEND
SCHEDULE BARS
REPORTED PROGRESS
WORKING SCHEDULE
EVENT
CRITICAL
TUE APR 3
WED APR 4
THU APR 5
FRI APR 6
SAT APR 7
SUN APR 8
MON APR 9
VOGTLE UNIT 1 SECOND REFUELING OUTAGE

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NUCLEAR PLANT MAINTENANCE WORK ORDER (1 OF 3)

1. CONTROL NO. 19001576 00 2. DATE 03/28/90 3. UNIT 1 4. SYSTEM LIST
5. EQ/TAG NO. LIST 5A. REPAIR TAG ____
MPL/TAG(S) ASSOCIATED WITH SPECIAL INDICATORS

6. PROB/WORK REQ. DIESEL GENERATOR 1A TRIPPED TWICE FOLLOWING TWO ACTUAL LOSS OF OFFSITE START CONDITIONS. THE TRIPS ACCURRED AFTER APPROXIMATELY 80 SECONDS AND 70 SECONDS OF OPERATION.

CONT. N

NPRD

ORIGINAL

7. INITIATOR KEN STOKES 8. SUPRV JP REDDING LOC LIST
9. MWO CLASS S EQP CLASS LIST 10. UNIT STAT 1R7 11. FIRE PROTECT NO
12. DCR N 13. NCR/DR N 14. TYPE MAINT P 15. DURATION 18 hrs

16. CRAFT	MECH (EST/ACT)	ELEC (EST/ACT)	I&C (EST/ACT)	CONT (EST/ACT)	HP/OT (EST/ACT)
CREW	0	28	0	0	0
HRS.	1	12	1	24	7
EXP.	0	0	0	0	0
SCHED BEG	1/1 HH	1/1	1/1 HH	1/1	1/1
SCHED END	1/1	1/1	1/1 HH	1/1	1/1 HH
RESP FOREMAN	1/1	1/1	1/1	1/1	1/1

17. CIR Y 19015367 HOLD POINT ATTACHED 18. WELD PERM N 0 RWP PERM N 0
19. QC HOLD FLAG 20. PROC
QC REVIEWED BY JC Ware 3/28/90 21. PRI 14 22. LCO 1903533
23. WORK INST. T.S. 3.8.1.1/3.8.1.2
SEE CONTINUATION SHEET
COOPER ENERGY TO PERFORM WORK UNDER P.O #6002124.

CONT. Y

24. INITIATE REVIEW 3/28/90
OPS JHC DATE 3/28/90 MNT COP DATE 3/28/90 25. SPEC REV REQ N 3/29/90
HP JHB DATE 3/28/90 ENG DATE 3/28/90 SIG. Gary Moore 26. MWO RELEASE FOR WORK DATE 3/29/90
27. ACT WORK PERFRMED See Block 27 Continuation Sheets
Ken Stokes was Notified @ 1600 CST that Testing was Ready To Begin had been Approved for Test to be Done. Dan Hawkins 3/28/90
Maintained Zone III housekeeping throughout. JHC

CONT. N

HIST SUM
28. MTRL REQD NA
29. PERSON PERFORMING WORK (NAME) Leslie Davis DATE 3/28/90 30. MAINTENANCE FOREMAN TR Nielsen DATE 4/1/90
31. INSPECTION PERFORMED BY Gary Williams DATE 4/5/90
32. METHOD OF F.T. Ops. Perform 4980-1 Date 4-2-90
33. PROCEDURE # 14980.1 34. PERFORMED BY E.C. Stokes 35. DATE 4/1/90
36. PROVES OPERABILITY NA 37. METHOD USED TO PROVE OPERABILITY NA
38. SATISFY/UNSATISFY 39. IF UNSAT, CORR. ACTION
40. UNIT STATUS AT TIME OF FAILURE 41. TYPE FAIL 42. MODE OF FAIL
43. CAUSE OF FAILURE 44. DETECT BY 45. EFFECT ON SYS
46. EFF ON PLANT 47. MWO STAT 6D 48. CAUSE 49. CORR ACT.
50. NEW MWO N/A 51. OPER. ACCEPT BY E.C. Stokes DATE 4/3/90
52. OSOS APPROVAL NA DATE
53. SPEC REV COMP DATE 54. MEET. # NA DATE
55. CLOSE OUT APPROVAL BY QC Jim McCoy 4-5-90 DATE

A TRAIN

** COPY ** COPY ** COPY ** COPY ** COPY ** COPY ** COPY ** COPY ** COPY

NUCLEAR PLANT MAINTENANCE WORK ORDER (CONTINUED) (2 OF 3)

CONTROL NO. 19001576 00

MPL/TAG NO.	SYSTEM	EQP CLS	DESCRIPTION	LOCATION
12403G4001	2403	015	DIESEL GENERATOR	1DGB1-
12403P5DG2	2403	11J	DG 1A ENGINE CNTRL PNL	1DGB1

3/30/90

WORK INSTRUCTIONS: PERFORM ENGINE LOGIC TESTING PER PROCEDURE 27563-C, REV 2. COOPER ENERGY SERVICES PERSONNEL WILL BE PERFORMING APPLICABLE PROTIONS OF THE PROCEDURE WITH ASSISTANCE FROM GPC PERSONNEL, AS REQUIRED. THE ELECTRICAL PORTIONS OF THE PROCEDURE NEED NOT BE RETESTED. ADDITIONAL INSTRUMENTATION MAY BE CONNECTED BY TEST PERSONNEL TO AID IN TROUBLESHOOTING ANY INSTRUMENTATION CONNECTED OR ADJUSTMENTS MADE SHALL BE DOCUMENTED COMPLETELY ON THIS MWO. DOCUMENT ANY PROBLEMS ENCOUNTERED WHILE PERFORMING THIS TEST.

STEP 1: FOLLOWING THE LOGIC TEST THE ENGINE WILL BE STARTED IN THE EMERGENCY MODE AND A LEAK TEST PERFORMED ON THESE LINES:

E-10A - TRIP LOW PRESSURE LUBE OIL
B - " " " " "
C - " " " " "
E-16A - TRIP HIGH TEMPERATURE JACKET WATER
B - " " " " "
C - " " " " "
E-68 - TRIP HIGH PRESSURE CRANKCASE
E-92 - TRIP LOW PRESSURE TURBO OIL
E-14 - TRIP LOW PRESSURE JACKET WATER
E-23H - TRIP HIGH VIBRATION
E-19 - TRIP HIGH TEMPERATURE ENGINE BEARINGS
E-18 - TRIP HIGH TEMPERATURE LUBE OIL.

TEST FOR LEAKAGE BY DISCONNECTING TUBING AT CONTROL PANEL BULKHEAD AND CONNECTING PNEUMATIC BUBBLE TESTER. OBSERVE TESTER FOR AIR FLOW WHEN LINE IS PRESSURIZED. RESTORE TUBING CONNECTION AT BULKHEAD AND CONTINUE WITH NEXT INSTRUMENT LINE.

STEP #2 NORMAL START
-TRIP BY HI-TEMP LUBE OIL

STEP #3 LOSP START (JUMPER IN GEN CONTROL PANEL 211 TO 213)
-TRIP BY HIGH VIBRATION

STEP #4 NORMAL START
-TRIP BY HIGH PRESS CRANKCASE

STEP #5 SI START (JUMPER IN GEN. CONTROL PANEL 204 TO 209)
-TRIP BY 2 OF 3 L.O. PRESSURE

NOTE

THE AREA OF TESTING SHALL BE ROPED AND ENTRANCE LIMITED TO ESSENTIAL PERSONNEL AS DETERMINED BY COOPER REPRESENTATIVES AND GPC ENGINEERING.

GPC ENGINEERING SHALL BE PRESENT FOR ALL TESTING AND QC REPRESENTATIVE PRESENT AS REQUIRED.

3/30/90

VOGTLE ELECTRIC GENERATING PLANT

GEORGIA POWER CO.

MAINTENANCE WORK ORDER REVISION SHEET

1 CONTROL NO.	2 REVISION NO.	3 MPL TAG NO.	4 DATE
1900572	A	1-2103-G4-001 -2403-P5-DG2	3/30/90

5 REASON FOR REVISION

BLOCK 23 SEE NEW WORK INSTRUCTIONS (ATTACHED) Pages 3 of 4 & 4 of 4

Released to Work

6 INITIATOR Billy Smith

3/30/90 Bill L. Smith 4203

REVIEW SIGNATURES

7 MAINTENANCE ENG K Nealon 3-30-90	8 OPERATIONS SMC 3-30-90	9 CLEARANCE REQUIRED NO
10 QC REVIEW DWalcmo	11 HOLD POINTS no additional hold pts required	
12 HP REVIEW [illegible] 3-30-90	13 NEW RWP REQUIRED NONE	
14 ANII REVIEW NA NA 3-30-90	15 HOLD POINTS NA	
16 WORK PLANNER Bill Smith 3/30/90	17 PROCEDURES NONE	
18 FIRE PROTECTION REVIEW NO Bill Smith 3/30/90	19 SHIFT SUPERVISOR [signature] 3/30/90	

20 REMARKS

WORK INSTRUCTIONS:

CAUTION

ALL PERSONNEL INVOLVED IN THE TESTING MUST READ AND UNDERSTAND THE ATTACHED CAUTION STATEMENT. DURING THE ENGINE START AND SUBSEQUENT TESTING IF ANY TRIPS OCCUR OTHER THAN PLANNED TRIPS OR OBSERVE OTHER SIGNIFICANT MALFUNCTION, STOP THE TEST AND NOTIFY IIT TEAM. TEST WILL NOT CONTINUE WITHOUT THE CONCURRENCE FROM IIT TEAM MEMBER. ANY PORTION OF THE TESTING THAT COULD IMPACT THE RELIABILITY AND SAFETY OF THE D/G SYSTEMS MUST BE EVALUATED BY GA POWER COMPANY PRIOR TO TESTING. IF A TEST NEEDS TO BE STOPPED, ENSURE ALL EQUIPMENT IS PLACED IN A SAFE POSITION.

PERFORM ENGINE LOGIC TESTING PER PROCEDURE 27563-C, REV 2. COOPER ENERGY SERVICES PERSONNEL WILL BE PERFORMING APPLICABLE PROTIONS OF THE PROCEDURE WITH ASSISTANCE FROM GPC PERSONNEL, AS REQUIRED. THE ELECTRICAL PORTIONS OF THE PROCEDURE NEED NOT BE RETESTED. ADDITIONAL INSTRUMENTATION MAY BE CONNECTED BY TEST PERSONNEL TO AID IN TROUBLESHOOTING ANY INSTRUMENTATION CONNECTED OR ADJUSTMENTS MADE SHALL BE DOCUMENTED COMPLETE ON THIS MWO. DOCUMENT ANY PROBLEMS ENCOUNTERED WHILE PERFORMING THIS TEST.

NOTE:

PRELUBE THE TUROCHARGER PRIOR TO EACH START. TURN ALL 3 VIEDO CAMERAS AND RECORDERS TO RECORD THE ANNUNCIATORS AND OTHER ENGINE & GENERATOR PARAMETERS.

STEP 1: FOLLOWING THE LOGIC TEST THE ENGINE WILL BE STARTED IN THE EMERGENCY MODE AND A LEAK TEST PERFORMED ON THESE LINES.

E-10A - TRIP LOW PRESSURE LUBE OIL
B " " " " "
C " " " " "
E-16A - TRIP HIGH TEMPERATURE JACKET WATER
B - " " " " "
C - " " " " "
E-68 - TRIP HIGH PRESSURE CRANKCASE
E-92 - TRIP LOW PRESSURE TURBO OIL
E-14 - TRIP LOW PRESSURE JACKET WATER
E-23H - TRIP HIGH VIBRATION
E-19 - TRIP HIGH TEMPERATURE ENGINE BEARINGS
E-18 - TRIP HIGH TEMPERATURE LUBE OIL.

AFTER RECONNECTING THE LINES FOLLOWING THE TEST, PERFORM LEAK DETECTION BY SNOOP DETECTOR AND FIX ANY LEAKS.

TEST FOR LEAKAGE BY DISCONNECTING TUBING AT CONTROL PANEL BULKHEAD AND CONNECTING PNEUMATIC BUBBLE TESTER. OBSERVE TESTER FOR AIR FLOW WHEN LINE IS PRESSURIZED. RESTORE TUBING CONNECTION AT BULKHEAD AND CONTINUE WITH NEXT INSTRUMENT LINE.

STARTING TIME BETWEEN EACH START MUST BE AT LEAST 10 MIN. RECORD THE TIME IN WORKORDER.

CONTROL NO. 19001576 00

WORK INSTRUCTIONS: ---------- PRIOR TO PERFORM MULTIPLE START TURN BOTH AIR COMPRESSORS OFF AND NOTE IN WORKORDER. AFTER THE MULTIPLE START IS COMPLETED TURN THE AIR COMPRESSORS ON & PLACE IN AUTO AND RECORD IN WORKORDER. NOTE THE STARTING AIR PRESSURE AT THE BEGINNING OF EACH MULTIPLE START AND AFTER EACH STOPPING/TRIPPING.

STEP #2 NORMAL START
-TRIP BY HI-TEMP LUBE OIL

STEP #3 LOSP START (JUMPER IN GEN CONTROL PANEL 211 TO 213)
-TRIP BY HIGH VIBRATION
STEP #4 NORMAL START
-TRIP BY HIGH PRESS CRANKCASE

STEP $5 SI START (JUMPER IN GEN. CONTROL PANEL 204 TO 209)
-TRIP BY 2 OF 3 L. O. PRESSURE

AFTER RECONNECTING THE LINES FOLLOWING THE BUBBLER TEST PERFORM LEAK DETECTION BY SNOOP DETECTOR AND FIX ANY LEAKS.

NOTE

THE AREA OF TESTING SHALL BE ROPED AND ENTRANCE LIMITED TO ESSENTIAL PERSONNELAS DETERMINED BY COOPER REPRESENTATIVES AND GPC ENGINEERING.

GPC ENGINEERING SHALL BE PRESENT FOR ALL TESTING AND QC REPRESENTATIVE PRESENT AS REQUIRED.

Nuclear Plant Maintenance Work Order Continuation Sheet

Pg # 1 OF 5

MPL No. 1-2403-P5-DG2 MWO No. 19001576

Work Description BLOCK 27 PROCEDURE VEGP 27563-C

CAP LINES E-16A, B, C AND E18 TO ALLOW SENSORS TO BE CALIBRATED.

OPEN LINK F10 TO DEENERGIZE DISABLED DG CKT BRKR INOPERABLE ANNUNCIATOR WINDOW

4.1.14 131.8 VOLTS DC READ

DISCONNECTED HORN WIRE # 402 3/29/90

4.2.31 Per request from Engineering, timed group II lockout signal from when start was initiated 63 seconds, satisfactory.

4.2.37 Repeated group II lockout time, 65 sec.s, satisfactory. Repeated one more time, 63 seconds, satisfactory. Group II lockout timer is consistant. 3-27-90

4.2.42.1 CLOSED LINKS L25 & L26 TO PERFORM STEP

RECONNECTED TURNS TO E-16A, B, C AND E-18

3-29-90

Block 23 cont) Maintain Zone II Housekeeping. 4-1-90

Nuclear Plant Maintenance Work Order Continuation Sheet

pg.# 2 OF 5

MPL No 1-2403-P5-DG2 MWO No 19001576

Work Description BLOCK 27 PROCEDURE YEGP 27563-C

WHILE ENGINE RUNNING IN EMERGENCY MODE A BUBBLE TEST WAS CONDUCTED ON THE PNEUMATIC LINES LISTED BELOW. AFTER RECONNECTING PNEUMATIC LINES, A SNOOP TEST WAS CONDUCTED ON FITTING. ONE HIGH TEMP JACKET WATER SENSOR TRIPPED AFTER ENGNE STARTED.

		BUBBLE TEST	SNOOP TEST
E-10A	TRIP LOW PRESSURE LUBE OIL	SATISFACTORY	SATISFACTORY
E-10B	TRIP LOW PRESSURE LUBE OIL	SATISFACTORY	SATISFACTORY
E-10C	TRIP LOW PRESSURE LUBE OIL	SATISFACTORY	SATISFACTORY
E-68	TRIP HIGH PRESSURE CRANKCASE	SATISFACTORY	SATISFACTORY
E-12	TRIP LOW PRESSURE TURBO OIL	1 BUBBLE/SECOND	WEEPS
E-14	TRIP LOW PRESSURE JACKET WATER	SATISFACTORY	HAS BUBBLES
E-23H	TRIP HIGH VIBRATION	2 BUBBLES/SECOND	WEEPS
E-19	TRIP HIGH TEMP ENG BRGS	1 BUBBLE/SECOND	SATISFACTORY
E-18	TRIP HIGH TEMP LUBE OIL	SATISFACTORY	WEEPS
E-16C	TRIP HIGH TEMP JACKET WATER	TRIPPED ENGINE 3 BUBBLES/SECOND	DID NOT PERFORM
E-16A	TRIP HIGH TEMP JACKET WATER	SATISFACTORY	DID NOT PERFORM

1020

ADDED PRESSURE GAUGES AT SENSORS OF LINES E-16A, B, C FOR TROUBLESHOOTING TO OBSERVE SENSOR OPERATION DURING ENGINE STARTING. FOUND SENSOR A MOVEMENT SLUGGISH.

			SNOOP TEST
STEP # 2	TRIP BY HI-TEMP LUBE OIL	SATISFACTORY	SATISFACTORY
STEP # 3	TRIP BY HIGH VIBRATION	SATISFACTORY	SATISFACTORY
STEP # 4	TRIP BY HIGH PRESS CRANKCASE	SATISFACTORY	SATISFACTORY
STEP # 5	TRIP BY 2 OF 3 L.O. PRESSURE	SATISFACTORY	SATISFACTORY

LINES E-16A, E-16B & E-16C REQUIRE BUBBLE TESTING

Lowell Pennett 3/31/90 1246 hrs

Nuclear Plant Maintenance Work Order Continuation Sheet

MPL No. 12403G4001/12304P5PG2 MWO No. 19001576

Work Description Block 27 Multiple starts with Air Compressors off

Air Comp #1 off Time 22:30 Air Comp #2 off Time 22:30

Starting Air Pressure

	Time	Air Receiver #1 PI-9060	Air Receiver #2 PI-9064
Step # 2			
Start	22:35	240 PSI	240 PSI
Stop	22:42	230 PSI	220 PSI
Step # 3			
Start	22:55	220 PSI	220 PSI
Stop	23:00	200 PSI	200 PSI
Step # 4			
Start	23:13	200 PSI	200 PSI
Stop	23:17	185 PSI	185 PSI
Step # 5			
Start	23:29	185 PSI	185 PSI
Stop	23:34	170 PSI	170 PSI

Air Comp #1 start Time 23:36 Air Comp #2 start Time 23:37

Recorded by H. Dennis 3/31/90

Block 26 cont) WP Stop 3/31/90

Nuclear Plant Maintenance Work Order Continuation Sheet

MPL No 1-2403-P5-D62 MWO No 19001576

Work Description BLOCK 27 PROCEDURE VEGP 27563-C

PRESSURE GAUGE INSTALLED TO MONITOR PILOT PRESSURE OF PILOT VALVE P3. THIS WAS DONE IN CONJUCTION WITH MWO 19001684 TO MONITOR PRESSURE DURING SENSOR TRIP TEST. DPrent 3/31/90 1900 HRS

PILOT PRESSURE 46.2PSI REACHED WITH TWO JACKET WATER HIGH TEMP SENSORS. ↓ ↓ 56PSI ↓ ↓ LOW PRESSURE IN JACKET WATER SENSOR DSP 3/31/90 DISCONNECTED. DPrent 3/31/90 2024 HRS

HIGH TEMP JACKET WATER SENSORS A&B CHANGED OUT. DSP 3/31/90

WHILE ENGINE SHUTDOWN A BUBBLER TEST WAS CONDUCTED ON THE FOLLOWING PNEUMATIC LINES.

E-16A TRIP HIGH TEMP JACKET WATER : 1 BUBBLE/SECOND

E-16B : SATISFACTORY

E-16C : SATISFACTORY

WHILE ENGINE RUNNING IN ~~EMERGENCY~~ DP NORMAL MODE A BUBBLER TEST WAS CONDUCTED ON THE FOLLOWING PNEUMATIC LINES: A SNOOP TEST WAS DONE ON THE FITTING BROKE FOR BUBBLER TEST.

		BUBBLER TEST	SNOOP TEST
E-16A	TRIP HIGH TEMP JACKET WATER	1 BUBBLE/SECOND	SAT.
E-16B		1 BUBBLE/5 SECONDS	SAT.
E-16C		SATISFACTORY	SAT.

DPrent 3/31/90

Nuclear Plant Maintenance Work Order Continuation Sheet

MPL No. 1-2403-6+C01 & 1-2403-P5-D62 MWO No. 900576

Work Description BK 26) Greg Moore 3-30-90

GEORGIA POWER COMPANY
VEGP QUALITY CONTROL

MWO No: 1900576

QC HOLD / WITNESS POINTS

PROCEDURE & REV No: ~~27563-C~~ 27563-C N/2

85010-C FIG. 1
PAGE 1 OF 1

NOTIFY QUALITY CONTROL PRIOR TO PERFORMING THE WORK ACTIVITY OR STEP ASSOCIATED WITH THE HOLD (H) OR WITNESS (W) POINT

DO NOT BYPASS QC HOLD OR WITNESS POINTS

STEP NO.	H/W	HOLD POINT / WITNESS POINT DESCRIPTION	ASSIGNED BY INIT	ASSIGNED BY DATE	NOTIFIED INIT	NOTIFIED DATE	QC ACTION INIT	QC ACTION I-W-N/A
	H	Notify QC at the hold points in procedure 27563-C	DC	3/28/90	JC4	3-29-90	JC4	I
	H	Notify QC prior to starting the diesel			PC	3/31/90	PC	I
	H	Notify QC prior to performing leak test			PC	3/31/90	PC	I
	H	Notify QC prior to performing the following steps						
		Step #2 Normal Start			TW	3-30-90	TW	I
		Step #3 Loop Start						
		Step #4 Normal Start			TW	3-30-90	TW	I
		Step #5 SI Start						
		Note: Steps 2, 3, 4, 5 are witness points for QC only. No inspection required.						

COMMENTS & IR NUMBERS: (Initial and date entries)

IR 34189 JC4 3/29/90

IR 34128 PC 3/31/90

* IR 34174 TW 3-31-90

THIS FORM TO BE COMPLETED BY QUALITY CONTROL PERSONNEL ONLY

Quality Control Inspection Report

VOGTLE GENERATING PLANT—UNITS 1 & 2

34174

Georgia Power

WO/QOR/DR No.	Building	Procedure/Spec. No./Rev.
1901576	"A" TRAIN DIESEL	NA
Room No./Level No.	**Sys./Start-Up Designator**	**Tag No.**
103 / 1	2403	1-2403-B5-DG2
Drawing No./Rev.	**Vendor Manual Log No.**	**Other**
NA	NA	NA

1. Inspector will use separate form for each completed inspection function(s) and insert original with work package, use continuation sheets when needed.
2. Use simple narrative type report procedure. Reference all applicable drawing numbers, specifications, special instructions, etc., connected with your inspection. Use sketches, when applicable, showing dimensions checked, alignment, physical location of defects found, etc. N/A all blocks not used.
3. Upon completion of the inspection activity, enter results below and sign and date.

Remarks

USUALLY VERIFIED: PERFORMANCE OF LEAK TEST ON THE FOLLOWING LINES PER STEP 1 OF RQ3 WORK ORDER.

Line	Results	Snoop Test
E-10A TRIP Low PRESSURE LUBE OIL	NO BUBBLES	NO LEAKS
E-10B "	NO BUBBLES	NO LEAKS
E-10-2 "	NO BUBBLES	NO LEAKS
E-62 TRIP HIGH PRESSURE CRANK CASE	NO BUBBLES	VISIBLE BUBBLES
E-92 TRIP LOW PRESSURE TURBO OIL	LEAK ≈ 1 BUBBLE PER SEC.	VISIBLE BUBBLES
E-14 TRIP LOW PRESSURE JACKET WATER	NO BUBBLES	VISIBLE BUBBLES
E-53H TRIP HIGH VIBRATION	LEAK ≈ 3 BUBBLES PER SEC	VISIBLE BUBBLES
E-19 TRIP HIGH TEMPERATURE EXHAUST MANIFOLD	LEAK ≈ 1 BUBBLE PER SEC	VISIBLE BUBBLES
E-7R TRIP HIGH TEMPERATURE LUBE OIL	NO BUBBLES	VISIBLE BUBBLES

Sketch

(+) LEAKS ABOVE HAVE NOT BEEN CORRECTED! PER MWO

SEE CONT SAT.

Inspection Results

☐ SAT. ☑ UNSAT—QOR/DR NO.(s): * 1-90-0154 D.C. (+)

7055.16A MCS191

Inspector

Date

Quality Control Inspection Report (CONTINUATION SHEET)
VOGTLE GENERATING PLANT—UNITS 1 & 2

Georgia Power

WO/ORD No./Other
1960576 T.E. 34174

Remarks

Visually Verified Performance of Multiple Starts Per Following SEI's Per Pg 4 of MWO.

STEP #2 Normal Start, Trip By High Temp Lube Oil By Loosening Fitting At 1TSH R146, Also Re-Tightening Effected.

STEP #3 LOSP Start By Lifting Jumper in Gen Control Panel Across TB 211 And 213. Then Trip By Loosening Fitting On Vibration Switch. Verified Jumper Removed And Fittings Tightened.

STEP #4 Normal Start, Trip By Loosening Fitting On High Crankcase Pressure Switch, Verified Re-Tightening of Fittings.

STEP #5 ST Start By Lifting Jumper in Gen Control Panel Across TB 204 And 205. Then Trip By Loosening Of Fittings On 2 of The 3 Low Oil Pressure Switches, Verified Removal Of Jumper And Fittings Tightened. All Connection Of Fittings Were Snoop Tested And Acceptable.

1EHCA, EHCB, EHCC Are Not Fully Tested. 1EHPIII And 1EHP1112 Were Not Functioning Properly Will Be Repaired. This Was Noticed On Start Of Diesel When High Temperature Start Light Came On. So To Determine Which Switch Was Initiating Alarm 3 Gauges, One For Each Temp Switch Was Connected In Line To Watch Pressure. Pressure Guage For 1EHPIII Did Not Increase As Rapidly As The Other Two Gauges So Cooper Rep. Crimped Open Tubing Line To 1EHPIII And Pressure Increased Rapidly At Guage He Then Released Tubing And Pressure Fell Off Down. This Was Repeated A Couple Of Times. Then Pressure Stored To Increase Until It Reached Operating Pressure

705517 MCS191

Inspector: Tony Williams

Date: 3-31-92

WHITE—Work Package CANARY—Q.C. Supv. PINK—Inspector

Quality Control Inspection Report

VOGTLE GENERATING PLANT—UNITS 1 & 2

34128

Georgia Power

WO/ODR/DR No.	Building	Procedure/Spec. No./Rev.
19001576	Diesel Generator	27563-SR/2
Room No./Level No.	**Sys./Start-Up Designator**	**Tag No.**
Room 103 Level 1	2403	1-2403-P5-DG2
Drawing No./Rev.	**Vendor Manual Log No.**	**Other**
N/A	N/A	N/A

1. Inspector will use separate form for each completed inspection function(s) and insert original with work package, use continuation sheets when needed.
2. Use simple narrative type report procedure. Reference all applicable drawing numbers, specifications, special instructions, etc., connected with your inspection. Use sketches, when applicable, showing dimensions checked, alignment, physical location of defects found, etc. N/A all blocks not used.
3. Upon completion of the inspection activity, enter results below and sign and date.

Remarks

Visually verified checking for leaks in Engine Control Panel 1-2403 P5 DG2. Lines E-16A, E-16B and E-16C were checked. During Bubble Test results were as follows.

E-16A 1 Bubble/5sec

E-16B 1 Bubble/3sec

E-16C no leakage detected.

Visually verified soap test for leaks on Lines in Engine Control Panel 1-2403 P5 DG2. Results were

E-16A - no leakage visible

E-16-B - some leakage detected this problem was solved by tightening fitting

E16C - NO leakage visible

Sketch

Inspection Results

☑ SAT. ☐ UNSAT—ODR/DR NO.(s):

7056 164 MCB 191

Inspector: Patrick L. Coleman Date: 3/31/90

WHITE—Work Package CANARY—QC Supv PINK—Inspector

Quality Control Inspection Report

VOGTLE GENERATING PLANT—UNITS 1 & 2

34172

Georgia Power

MWO/ODR/DR No.	Building	Procedure/Spec. No./Rev.
1901576	"A" TRAIN DIESEL	27563-C R2
Room No./Level No.	Sys./Start-Up Designator	Tag No.
103 / 1	2403	2403-PS-DG2
Drawing No./Rev.	Vendor Manual Log No. AX4AR01-509 R11	Other
NA		NA

1. Inspector will use separate form for each completed inspection function(s) and insert original with work package, use continuation sheets when needed.
2. Use simple narrative type report procedure. Reference all applicable drawing numbers, specifications, special instructions, etc., connected with your inspection. Use sketches, when applicable, showing dimensions checked, alignment, physical location of defects found, etc. N/A all blocks not used.
3. Upon completion of the inspection activity, enter results below and sign and date.

Remarks

VISUALLY VERIFIED; RECONNECTION OF TUBING BY CAP WK LINE PER STEP 4.2.59 AND DEENERGIZATION OF ALARM PER STEP 4.2.59.1 UNIT AUXILIARE ERROR STATUS LIGHT ENERGIZED PER STEP 4.2.64.1 AND DROPPED R.C. START POWER FAILURE ALARM DEENERGIZED PER STEP 4.2.64.2. RELAY R-23B DEENERGIZED PER STEP 4.2.66.1 INCORRECT ON DATA SHT. SHOWS R-23D. EREQUENCY GENERATOR OFF AND TUBING FILA & B RECAPED PER STEP 4.2.72 DATA SHT DOES NOT SHOW A & B 4.2.74 TUBING LINES E16B AND E16C RECAPED 4.2.76 TUBING LINES E16A AND E16C RECAPED. 4.2.77.1 GROUP I PRESSURE < 2.5 PSI. THERE IS NO I.D ON GAUGE STATING IT IS GROUP I GAUGE ENG. PAUL COCHERY VERIFIED THIS GAUGE AS PROPER GAGE. PER VENDOR MANUAL AX4AR01-509 R11 PRESSURE GAUGE IS CORRECT

Sketch

NA

Inspection Results

☑ SAT. ☐ UNSAT—ODR/DR NO.(s):

Inspector [signature] Date 3-29-90

WHITE—Work Package CANARY—O.C. Supv PINK—Inspector

Quality Control Inspection Report (CONTINUATION SHEET)
VOGTLE GENERATING PLANT—UNITS 1 & 2

Georgia Power

NCR/VORD No./Other
1GGC1576

Remarks

I.R. 34172

4.2.77.2 BY PASS TEST FAILURE LIGHT DEENERGIZED
4.2.77.3.1 BY PASS TEST FAILURE LIGHT ENERGIZED.
4.2.89.1 TURBINE RECONNECTED AT FITTING E10A
4.2.89.2 E10B
4.2.89.3 E10C
4.2.90 E92
4.2.91 E14
4.2.94 REMOVAL OF LIFTED WIRE PER LIFTED LEAD LOG SHT.
4.2.95 VERIFIED ALSO LIFTED CLOSED PER LIFTED LEAD LOG SHT. AND JUMPERS REMOVED AND LIFTED WIRES REMOVED.
CABLE 1ACBAG05A.SR FOR STEP 4.2.94 TB. E10A
CABLE 1ACBAG05B.ST FOR STEP-4.2.95 TB. E10B

Inspector [signature]

Date 3-29-90

WHITE—Work Package CANARY—Q.C. Supv. PINK—Inspector

Quality Control Inspection Report

VOGTLE GENERATING PLANT—UNITS 1 & 2

34189

Georgia Power

MWO/ODR/DR No.	Building	Procedure/Spec. No./Rev.
19001576	Diesel	27563-C R/2
Room No./Level No.	**Sys./Start-Up Designator**	**Tag No.**
TRAIN A	2403	12403P5 DG 2
Drawing No./Rev.	**Vendor Manual Log No.**	**Other**
N/A	N/A	N/A

1. Inspector will use separate form for each completed inspection function(s) and insert original with work package, use continuation sheets when needed.
2. Use simple narrative type report procedure. Reference all applicable drawing numbers, specifications, special instructions, etc., connected with your inspection. Use sketches, when applicable, showing dimensions checked, alignment, physical location of defects found, etc. N/A all blocks not used.
3. Upon completion of the inspection activity, enter results below and sign and date.

Remarks

① Started witnessing Engine Logic Testing at approximately 1500 CST using 27563-C R/2

M&TE used

FUNCTION GENERATOR	VP 1283	CDD 7-27-90
Fluke	VP 1028	CDD 4-9-90
Fluke	VP1-1044	CDD 4-8-90

② Visually witnessed the following steps performed in procedure 27563-C R/2

step 4.1.13	60 PSI at Control air pressure gauge
4.1.14	125 VDC access circuit breakers CB-1 & 2 CB 3 & 4
4.2.24.1	125 volts present
4.2.24.3	contact closed
4.2.24.4	Relays energized
4.2.24.5	Contact closed
4.2.24.6	S.I signal Light Energized
4.2.24.7	Shutdown Light De-Energized
4.2.24.8	No voltage on solenoid

continued on page 2

Sketch

Inspection Results

☒ SAT. ☐ UNSAT—ODR/DR NO.(s):

Inspector J. C. Hardey Date 3-29-90

7066 NA MCB 191

WHITE—Work Package CANARY—Q.C. Supv. PINK—Inspector

Quality Control Inspection Report (CONTINUATION SHEET)
VOGTLE GENERATING PLANT—UNITS 1 & 2

Georgia Power

MWO/ORD No/Other 1001576 IR 34189

Remarks

4.2.26.2 Shutdown cylinder not extended
4.2.27 Tubing E-18 Reconnected
4.2.27.1 Ground pressure gauge 60 PSI
4.2.27.2 Hi temp alarm de-energized
4.2.28.1 Stopping Light Energize
4.2.28.2 Low pressure alarm energized
4.2.28.5 Engine Shutdown Cylinder Extended
4.2.30 E-42 plug installed
4.2.30.1.1 Relay 11B Energized
4.2.30.1.4 Recall to load Light energized
4.2.30.2.4 Recall to load light de-energized
4.2.31.1 No voltage present
4.2.31.2 Relay R-5B Energized
4.2.32.1 Relay R-23B Energized
4.2.32.12 Relay R-35 Energized
4.2.32.12.1.1 Relay R-35 Energized
4.2.32.12.1.2 Emergency trip Re-Energized
4.2.35.2 Overspeed trip deenergized
4.2.36.1 Relay R23B De-Energized
4.2.36.5 Emergency stop light De-energized
4.2.36.6 Stopping light Re-energized
4.2.36.7 Relay R-35 De-energized
4.2.37.1 125 VDC present
4.2.37.2 DG Auto Start signal Energized
4.2.37.2.1 Relay R23B Energized
4.2.41.1 Emergency trip Alarm is Energized
4.2.41.3 Relay R-35 Energized
4.2.42.3 Relay R-35 De-Energized
4.2.48.1 125 VDC present
4.2.48.2 Failure to start Alarm Energized
4.2.49.1 No voltage present
4.2.49.5 Starting Light Energized
4.2.49.6 Relay R1 Energized
4.2.49.7 Running light Energized

See continuation pg 3

705617 MCS191

Inspector J.C. Harvey Date 3-29-90

WHITE—Work Package CANARY—Q.C. Supv. PINK—Inspector

Quality Control Inspection Report (CONTINUATION SHEET)
VOGTLE GENERATING PLANT—UNITS 1 & 2

Georgia Power

MWO/ORD No./Other
1900/576 IR 34189

Remarks

~~step~~ 4.2.44 pf 3/29/90

step 4.2.50.1 Shutdown cylinder E Head
4.2.51.1 Hi bearing temp Alarm De-Energized
4.2.53.1 125V DC Present
4.2.55 Tubing E-68 Reconnected
4.2.55.1 Hi Pressure Alarm De-Energized
4.2.55.4 Shutdown Cylinder not extended
4.2.57 Tubing E-23-1d Reconnect
4.2.57.1 Vibration Alarm De-energized

~~All hr~~ pf 3-29-90

All steps were performed as required by procedure 77563-C

N/A

P08517 MCB191

Inspector J. C. Harvey

Date 3-29-90

WHITE—Work Package CANARY—QC Supv PINK—Inspector

14/1

EQ EVALUATION CHECKLIST

FOR USE ON PROJECT CLASSES Q111, Q212, Q313, Q013, Q015, Q11E, Q11J, Q12E, 61J

MWO NO. 19001576

SECTION I

PART A ORIGINAL PART

1. DESCRIPTION DIESEL GEN
2. TAG NO. 1-2403-G4-001
3. PROJECT CLASS 015
4. SPECIFICATION (EQDP) NO. X4AK01
5. MANUFACTURER DELAVAL
6. MODEL NO. NA
7. PART NO.

PART B REPLACEMENT PART

1. DESCRIPTION
2. MER NO.
3. STOCK NO.
4. SPECIFICATION (EQDP) NO.
5. MANUFACTURER
6. MODEL NO. N/A
7. PART NO. A
8. PO NO.

COMMENTS NO PARTS USED

SECTION II WORK PLANNING

1. ARE PROCEDURES, VENDOR MANUALS, DRAWINGS OR INSTRUCTIONS AVAILABLE TO DISASSEMBLE/REWORK COMPONENT? ✓ YES ___ NO (Init. CJS Date 13/2690)
2. ARE SPECIFICATION NUMBERS FOR ORIGINAL AND REPLACEMENT ITEMS THE SAME? ___ YES ___ NO
3. ARE MANUFACTURER MODEL/PART NUMBERS OF THE ORIGINAL AND REPLACEMENT PARTS THE SAME? ___ YES ___ NO
4. IS BULK MATERIAL LISTED ON ATTACHMENT ACCEPTABLE? LIST ITEM NO. FROM ATTACHMENT IF "NO" IS CHECKED. ___ YES N/A NO (Item No.)

(Init. / Date)

NOTE

If items 2, 3, or 4 are checked No, the Checklist must be reviewed by the EQ Group.

[N/A] PART(S) ARE ACCEPTABLE FOR USE
[N/A] SEND TO EQ GROUP

TKWatson 14-290
QPG DATE

SECTION III EQ GROUP EVALUATION

[ ] PART IS ACCEPTABLE FOR USE [ ] PART IS UNACCEPTABLE FOR USE

JUSTIFICATION FOR ACCEPTANCE: N/A

EQ ENGINEER / DATE

FIGURE 3

VEGP FIRE PROTECTION CHECKLIST

1. MWO NO. 19021576 2. MPL/TAG NO. 1240364001
3. LOCATION D.G. BLDG. "A" TRAIN

4. WILL THE WORK INSTALL, IMPAIR, MODIFY, ISOLATE, DEFEAT, OR REMOVE ANY OF THE FOLLOWING? IF THE ANSWER IS "YES" CHECK THE BOX, AND INDICATE APPROPRIATE DETAILS.

( ) SPRINKLER SYSTEM
( ) INTERIOR HOSE STATION
( ) HALON SYSTEM
( ) DETECTION SYSTEM
( ) EMERGENCY LIGHTING SYSTEM
( ) PERMANENT COMBUSTIBLES (CABLE, WOOD, PLASTIC, ETC.)
( ) STRUCTURAL STEEL, OR RACEWAY FIREPROOFING
( ) FIRE SUPPRESSION SUPPLY SYSTEM (PUMPS, TANKS, ETC.)
( ) CONDUIT SEALS OR EQUIPMENT ENCLOSURE (CABINET HOUSING)
( ) FIRE EXTINGUISHER
( ) COMMUNICATIONS SYSTEM
( ) RCP OIL COLLECTION SYSTEM
( ) SEISMIC STANDPIPE SYSTEM

5. WILL THE WORK DEFEAT, MODIFY OR IMPAIR ANY OF THE FOLLOWING FIRE SEPARATION FEATURES? IF THE ANSWER IS "YES" CHECK THE BOX, AND INDICATE APPROPRIATE DETAILS.

( ) A. FIRE AREA BOUNDARY (WALL, ETC.)
( ) B. PASSIVE AREA BOUNDARY PENETRATION SEAL ASSEMBLY.
PENETRATION SEAL
WALL BLOCKOUT
FLOOR PLUG OR HATCH
CABLE TRAY OR CONDUIT WRAP
RADIANT ENERGY SHIELD
( ) C. ACTIVE FIRE AREA BOUNDARY PENETRATION SEAL.
FIRE DOOR
FIRE DAMPER

6. IF ALL THE ANSWERS IN BLOCKS 4 and 5 ARE "NO", STOP THE EVALUATION HERE, AND ENTER "NO" IN BLOCK 11 OF THE MWO FORM. IF ANY QUESTIONS WERE ANSWERED "YES", ENTER "YES" IN BLOCK 11 OF THE MWO FORM.

EVALUATOR [signature] DATE 3/28/95

POST WORK REVIEW (COMPLETE "A, B, OR C" BELOW)

(A) THE CONDITION IMPACTING THE FIRE PROTECTION COMPONENTS LISTED ABOVE HAS BEEN REMOVED. FPE _____ DATE _____

N/A

(B) THE FIRE PROTECTION COMPONENT IS STILL IMPAIRED.
FPE _____ DATE _____

(C) RESTORATION OF THE IMPAIRMENT HAS BEEN TRANSFERRED (Ref: _____) AND THE FIRE PROTECTION LCO LOG HAS BEEN CHANGED TO REFERENCE THE NEW MWO FOR THIS IMPAIRMENT. FPE _____ DATE _____

FIGURE 1

703445

USE WITH CONTROL NO. 19001576

Procedure No.	Revision	Page No.
VEGP 27563-C	2	45 of 75

POWER AND SIGNAL REMOVAL/REPLACEMENT DATA SHEET

Sheet 1 of 1
1 of 12

[X] Safety Related/QC Holdpoints

[ ] Non-Safety Related

NOTES

a. To install jumpers and/or lift wires, other than those directly associated with the equipment tag(s)/scheme number(s) listed on the Work Order, notify the Shift Supervisor and comply with his instructions.

b. Ensure that each lead (wire) is marked so it can be uniquely identified with its termination point.

c. Independent verification is only required on safety related equipment. Place N/A in independent verification block for non-safety related equipment.

d. If the worker leaves the immediate proximity of the work or the work is interrupted, complete and install a "Jumper and Lifted Wire" tag per 00306-C, "Temporary Jumper And Lifted Wire Control". Instead of Control Number use the Procedure number on the tag.

e. If holdpoints do not apply, NA QC Verification block.

f. If applicable, tags shall remain intact and will only be removed by the independent verifier.

IDENTIFY LEADS LIFTED, JUMPERS INSTALLED, LINES OPEN, ETC.	REMOVAL				RECONNECTION		
	LOCATION PANEL OR JUNCTION BOX	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC HOLD POINT QC VERIF. BY/DATE
OPEN LINK E5-4	1-2403-P5-062	RAJ 3/29/90	DJP 3/29/90		DJP 3/29/90	RAJ 3-29-90	RAJ 3-29-90
E4-2							
L5-105							
L4-107							
E19-53							
E22-56				N/A			
OPEN E4-E11-51							
E21-55							
E23-57							
E18-52		RAJ 3/29/90	DJP 3/29/90		DJP 3/29/90	RAJ 3-29-90	RAJ 3-29-90

FORM NO

Procedure No.	Revision	Page No.
VEGP 27563-C	2	45 of 75

POWER AND SIGNAL REMOVAL/REPLACEMENT DATA SHEET

Sheet 1 of 1
2 of 12

[X] Safety Related/QC Holdpoints [ ] Non-Safety Related

NOTES

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f. If applicable, tags shall remain intact and will only be removed by the independent verifier.

REMOVAL					RECONNECTION			QC HOLD POINT
IDENTIFY LEADS LIFTED, JUMPERS INSTALLED, LINES OPEN, ETC.	LOCATION PANEL OR JUNCTION BOX	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE	
ONLY LINE E24-59	1-2403-P5-DG2	RAJ 3/29/90	DSP 3/29/90		DSP 3/29/90	RAJ 3-29-90	TW 3-29-90	
E5-77								
E6-78								
E57-46								
E58-47								
E59-48				N/A				
E60-49								
F1-73								
F2-74								
F3-75		RAJ 3/29/90	DSP 3/29/90		DSP 3/29/90	RAJ 3-29-90	TW 3-29-90	

Procedure No.	Revision	Page No.
VEGP 27563-C	2	45 of 75

POWER AND SIGNAL REMOVAL/REPLACEMENT DATA SHEET

Sheet 1 of 1

30 of 12

[X] Safety Related/QC Holdpoints

[ ] Non-Safety Related

NOTES

a. To install jumpers and/or lift wires, other than those directly associated with the equipment tag(s)/scheme number(s) listed on the Work Order, notify the Shift Supervisor and comply with his instructions.

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e. If holdpoints do not apply, NA QC Verification block.

f. If applicable, tags shall remain intact and will only be removed by the independent verifier.

REMOVAL					RECONNECTION		
IDENTIFY LEADS LIFTED, JUMPERS INSTALLED, LINES OPEN, ETC.	LOCATION PANEL OR JUNCTION BOX	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC HOLD POINT QC VERIF. BY/DATE
OPEN HDR F9-76	1-2403-P5-DG2	RAJ 3/29/90	DJP 3/29/90		DJP 3/29/90	RAJ 3-29-90	T.W. 3-29-90
L30-170							
L31-171							
~~L31~~ L32-172							
L33-173							
L23-153				N/A			
L20-141							
L21-144							
L24-155							
L51-159		RAJ 3/29/90	DJP 3/29/90		DJP 3/29/90	RAJ 3-29-90	T.W. 3-29-90

T.W. 3/29/90

Procedure No.	Revision	Page No.
VEGP 27563-C	2	45 of 75

POWER AND SIGNAL REMOVAL/REPLACEMENT DATA SHEET

Sheet 1 of 1

4 or 12

[X] Safety Related/QC Holdpoints [ ] Non-Safety Related

NOTES

a. To install jumpers and/or lift wires, other than those directly associated with the equipment tag(s)/scheme number(s) listed on the Work Order, notify the Shift Supervisor and comply with his instructions.

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e. If holdpoints do not apply, NA QC Verification block.

f. If applicable, tags shall remain intact and will only be removed by the independent verifier.

REMOVAL					RECONNECTION		QC HOLD POINT
IDENTIFY LEADS LIFTED, JUMPERS INSTALLED, LINES OPEN, ETC.	LOCATION PANEL OR JUNCTION BOX	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE
OPEN HVK L52-160	1-2403-P5-DG2	RAJ 3/29/90	DJP 3/29/90		DJP 3/29/90	RAJ 3-29-90	RW 3-29-90
L53-169							
L54-165							
L55-166							
L56-167				NA			
L57-168							
L58-169							
L59-179							
L60-180							
L35-175		RAJ 3/29/90	DJP 3/29/90		DJP 3/29/90	RAJ 3-29-90	RW 3-29-90

Procedure No.	Revision	Page No.
VEGP 27563-C	2	45 of 75

POWER AND SIGNAL REMOVAL/REPLACEMENT DATA SHEET

Sheet 1 of 1

5 of 12

[X] Safety Related/QC Holdpoints

[ ] Non-Safety Related

NOTES

a. To install jumpers and/or lift wires, other than those directly associated with the equipment tag(s), scheme number(s) listed on the Work Order, notify the Shift Supervisor and comply with his instructions.

b. Ensure that each lead (wire) is marked so it can be uniquely identified with its termination point.

c. Independent verification is only required on safety related equipment. Place N/A in independent verification block for non-safety related equipment.

d. If the worker leaves the immediate proximity of the work or the work is interrupted, complete and install a "Jumper and Lifted Wire" tag per 00306-C, "Temporary Jumper And Lifted Wire Control". Instead of Control Number use the Procedure number on the tag.

e. If holdpoints do not apply, NA QC Verification block.

f. If applicable, tags shall remain intact and will only be removed by the independent verifier.

REMOVAL					RECONNECTION		
IDENTIFY LEADS LIFTED, JUMPERS INSTALLED, LINES OPEN, ETC.	LOCATION PANEL OR JUNCTION BOX	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC HOLD POINT QC VERIF. BY/DATE
OPEN LINES L36-176	1-2403-P5-062	RAJ 3/29/90	DSP 3/29/90		DSP 3/29/90	RAJ 3-29-90	RW 3-29-90
L9-137							
L10-138							
L11-139							
L12-140							
L19-336				N/A			
L15-337							
L49-59B1							
L50-59B2							
L25-79-180		RAJ 3/29/90	DSP 3/29/90		DSP 3/29/90	RAJ 3-29-90	RW 3-29-90

Sheet 1 of 1
6 of 12

POWER AND SIGNAL REMOVAL/REPLACEMENT DATA SHEET

[X] Safety Related/QC Holdpoints [ ] Non-Safety Related

NOTES

a. To install jumpers and/or lift wires, other than those directly associated with the equipment tag(s)/scheme number(s) listed on the Work Order, notify the Shift Supervisor and comply with his instructions.

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e. If holdpoints do not apply, NA QC Verification block.

f. If applicable, tags shall remain intact and will only be removed by the independent verifier.

		REMOVAL			RECONNECTION		QC HOLD POINT
IDENTIFY LEADS LIFTED, JUMPERS INSTALLED, LINES OPEN, ETC.	LOCATION PANEL OR JUNCTION BOX	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE
OPEN LINK L26 - 90-180	1-2403-P5-DG2	JAJ 3/29/90	DJP 3/29/90		[illegible] 3-29-90	JAJ 3-29-90	[illegible] 3-29-90
C3 - 244					DJP 3/29/90		
C9 - 245							
C5 - 246							
C11 - 247							
C7 - 239							
C8 - 240							
G3 - 253							
G4 - 254							
G5 - 255		JAJ 3/29/90	DJP 3/29/90		DJP 3/29/90	JAJ 3-29-90	[illegible] 3-29-90

Procedure No.	Revision	Page No.
VEGP 27563-C	2	45 of 75

POWER AND SIGNAL REMO..., ... T DATA SHEET

Sheet 1 of 1

7 of 12

[X] Safety Related/QC Holdpoints

[ ] Non-Safety Related

NOTES

a. To install jumpers and/or lift wires, other than those directly associated with the equipment tag(s)/scheme number(s) listed on the Work Order, notify the Shift Supervisor and comply with his instructions.

b. Ensure that each lead (wire) is marked so it can be uniquely identified with its termination point.

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d. If the worker leaves the immediate proximity of the work or the work is interrupted, complete and install a "Jumper and Lifted Wire" tag per 00306-C, "Temporary Jumper And Lifted Wire Control". Instead of Control Number use the Procedure number on the tag.

e. If holdpoints do not apply, NA QC Verification block.

f. If applicable, tags shall remain intact and will only be removed by the independent verifier.

IDENTIFY LEADS LIFTED, JUMPERS INSTALLED, LEADS OPEN, ETC.	LOCATION PANEL OR JUNCTION BOX	REMOVAL			RECONNECTION		QC HOLD POINT
		PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE
OPEN LINK G6-256	1-2403-P5-DG2	RAJ 3/29/90	DJP 3/29/90		DJP 3/29/90	RAJ 3-29-90	[illegible] 3-29-90
G7-257							
G8-258							
G9-259							
G10-260							
G11-~~261~~ 261		RAJ 3-29-90		N/A			
G12-~~262~~ 262		RAJ 3-29-90					
G13-263							
G14-264							
G15-265		RAJ 3/29/90	DJP 3/29/90		DJP 3/29/90	RAJ 3-29-90	[illegible] 3-29-90

Procedure No.	Revision	Page No.
VEGP 27563-C	2	45 of 75

POWER AND SIGNAL REMOVAL/REPLACEMENT DATA SHEET

Sheet 1 of 1

8 of 12

[X] Safety Related/QC Holdpoints [ ] Non-Safety Related

NOTES

a. To install jumpers and/or lift wires, other than those directly associated with the equipment tag(s)/scheme number(s) listed on the Work Order, notify the Shift Supervisor and comply with his instructions.

b. Ensure that each lead (wire) is marked so it can be uniquely identified with its termination point.

c. Independent verification is only required on safety related equipment. Place N/A in independent verification block for non-safety related equipment.

d. If the worker leaves the immediate proximity of the work or the work is interrupted, complete and install a "Jumper and Lifted Wire" tag per 00306-C, "Temporary Jumper And Lifted Wire Control". Instead of Control Number use the Procedure number on the tag.

e. If holdpoints do not apply, NA QC Verification block.

f. If applicable, tags shall remain intact and will only be removed by the independent verifier.

REMOVAL					RECONNECTION		
IDENTIFY LEADS LIFTED, JUMPERS INSTALLED, LINES OPEN, ETC.	LOCATION PANEL OR JUNCTION BOX	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE QC HOLD POINT
OPEN LINK G16-266	1-2403-P5-DG2	RAJ 3/29/90	DSP 3/29/90		DSP 3/28/90	RAJ 3-29-90	[illegible] 3-29-90
G17-267							
G18-268							
G19-269							
G20-270							
G21-271							
G22-272							
G23-273							
G24-274							
H1-275		RAJ 3/29/90	DSP 3/29/90		DSP 3/29/90	RAJ 3-29-90	[illegible] 3-29-90

AP45 MS

Procedure No.	Revision	Page No.
VEGP 27563-C	2	45 of 75

POWER AND SIGNAL REMOVAL/REPLACEMENT DATA SHEET

Sheet 1 of 1

9 of 12

[X] Safety Related/QC Holdpoints [ ] Non-Safety Related

NOTES

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e. If holdpoints do not apply, NA QC Verification block.

f. If applicable, tags shall remain intact and will only be removed by the independent verifier.

	REMOVAL				RECONNECTION		QC HOLD POINT
IDENTIFY LEADS LIFTED, JUMPERS INSTALLED, LINES OPEN, ETC.	LOCATION PANEL OR JUNCTION BOX	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE
OPEN LINK H2-276	1-2403-P5-0G2	RAJ 3/27/90	DSP 3/29/90		DSP 3/29/90	RAJ 3-29-90	DJS 3-29-90
H19-298							
H20-299							
H3-277							
H4-278				N/A			
~~H7~~ H7-281							
H8-282							
H9-283							
H10-284							
H11-285		RAJ 3/27/90	DSP 3/29/90		DSP 3/29/90	RAJ 3-29-90	DJS 3-29-90

Procedure No.	Revision	Page No.
VEGP 27563-C	2	45 of 75

POWER AND SIGNAL REMOVAL/REPLACEMENT DATA SHEET

Sheet 1 of 1

10 of 12

[X] Safety Related/QC Holdpoints

[ ] Non-Safety Related

NOTES

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REMOVAL					RECONNECTION		QC HOLD POINT
IDENTIFY LEADS LIFTED, JUMPERS INSTALLED, LINES OPEN, ETC.	LOCATION PANEL OR JUNCTION BOX	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE
OPEN WIRE H12-286	1-2403-P5-DG2	RAJ 3/29/90	DSP 3/29/90		DSP 3/29/90	RAJ 3-29-90	[illegible]
H13-287							
H14-288							
H15-289							
H16-290							
H17-296							
H18-297							
A35-612							
A36-613							
F7-79		RAJ 3/29/90	DSP 3/29/90		DSP 3/29/90	RAJ 3-29-90	[illegible]

Procedure No.	Revision	Page No.
VEGP 27563-C	2	45 of 75

POWER AND SIGNAL REMOVAL/REPLACEMENT DATA SHEET

Sheet 1 of 1

11 or 12

[X] Safety Related/QC Holdpoints

[ ] Non-Safety Related

NOTES

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e. If holdpoints do not apply, NA QC Verification block.

f. If applicable, tags shall remain intact and will only be removed by the independent verifier.

REMOVAL					RECONNECTION		
IDENTIFY LEADS LIFTED, JUMPERS INSTALLED, LINES OPEN, ETC.	LOCATION PANEL OR JUNCTION BOX	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC HOLD POINT QC VERIF. BY/DATE
OPEN LINK FB-B0	1-2403-P5-D62	RAJ 3/29/90	DJP 3/29/90		DJP 3/29/90	RAJ 3-29-90	[illegible]
LIFTED LEAD 4	EJBA	↓	CDP 3/29/90				
LIFTED LEAD 105	EJBB	RAJ 3/29/90	DJP 3/29/90				
Jumper E49-E50	1-2403-P5-D62	[illegible] 3-29-90	DJP 3/29/90				
Jumper L57-L42	1-2403-P5-D62	[illegible] 3-29-90	DJP 3/29/90				
OPEN LINK F10-B9	1-2403-P5-D62	[illegible] 3-29-90	DJP 3/29/90				
LIFTED LEAD 402 - Relay 15 Across 401A	1-2403-P5-D62	RAJ 3/29/90	[illegible] 3-29-90		DJP 3/29/90	RAJ 3-29-90	[illegible]

Procedure No.	Revision	Page No.
VEGP 27563-C	2	45 of 75

POWER AND SIGNAL REMOVAL/REPLACEMENT DATA SHEET

Sheet 1 of 1

12 or 12

[X] Safety Related/QC Holdpoints

NOTES

[ ] Non-Safety Related

a. To install jumpers and/or lift wires, other than those directly associated with the equipment tag(s)/scheme number(s) listed on the Work Order, notify the Shift Supervisor and comply with his instructions.

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e. If holdpoints do not apply, NA QC Verification block.

f. If applicable, tags shall remain intact and will only be removed by the independent verifier.

IDENTIFY LEADS LIFTED, JUMPERS INSTALLED, LINES OPEN, ETC.	REMOVAL				RECONNECTION		QC HOLD POINT
	LOCATION PANEL OR JUNCTION BOX	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE	PERFORMED BY/DATE	INDEPENDENT VERIFICATION BY/DATE	QC VERIF. BY/DATE

N/A

FORM 10

COMPLETION SHEET

PROCEDURE	REVISION	SHEET
27563-C	2	1 OF 30
TAG NO.	DESCRIPTION	
1-2403-G4-001	DIESEL GENERATOR	
SERIAL NO.	MANUFACTURER	MODEL
76021	ENTERPRISE	DSRV-16-4
TEST EQUIPMENT USED	M&TE #	[X] Safety Related/QC Hold Point
See Block 27	See Block 27	[ ] Non-Safety Related

HWO 1900945 76

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.1.1	Prerequisites met	DA 3-29-90	NO	[illegible] 3/28/90
4.1.2	Shift Supervisor notified	RAJ 3-29-90		
4.1.5.1	Tubing E-10A disconnected	[illegible] 3-29-90		
4.1.5.2	Tubing E-10B disconnected	/		
4.1.5.3	Tubing E-10C disconnected	/		
4.1.6.1	Tubing E-92 disconnected	/		
4.1.7.1	Tubing E-14 disconnected	[illegible] 3-29-90		
4.1.8.1	A-Bank Starting Air Valve. Terminals E5 (4) and E4 (2).	RAJ 3/29/90		
4.1.8.2	B-Bank Starting Air Valve. Terminals L5 (105) and L4 (102).	RAJ 3/29/90		

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.1.8.3	Field Flash, Exciter Reg Enable. Terminals E19 (53), E22 (56), E17 (51), and E21 (55).			
4.1.8.4	Preset V.R. and Gov.: Terminals E23 (57), E18 (52), and E24 (59).	RAT 3/29/90	No	RCK 3/28/90
4.1.8.5	Ready to Load, DG Brkr.: Terminals F5 (77) and F6 (78).			
4.1.8.6	Ready to Load, HVAC Sys.: Terminals E57 (46) and E58 (47).			
4.1.8.7	Ready to Load, Spare. Terminals E59 (48) and E60 (49).			
4.1.8.8	Start, Spare. Terminals F1 (73) and F2 (74).			
4.1.8.9	Stop, Spare. Terminals F3 (75) and F4 (76).			
4.1.8.10	Pre-position Gov and V.R. Terminals L30 (170) and L31 (171).			
4.1.8.11	186C Trip Delay Terminals L32 (172) and L33 (173).			
4.1.8.12	Field Flash, Exciter Reg Enable. Terminals L23 (153), L20 (141), L21 (144), and L24 (155).			
4.1.8.13	Trip 52G. Terminals L51 (159) and L52 (160).			
4.1.8.14	Emergency Stop. Terminals L53 (164) and L54 (165).	RAT 3/29/90		

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/NO)	QC INIT/DATE
4.1.8.15	Running, Spare. Terminals L55 (166) and L56 (167).	RAT 3/29/90	No	KLH 3/28/90
4.1.8.16	Running, Spare. Terminals L57 (168) and L58 (169).			
4.1.8.17	Overspeed, Spare. Terminals L59 (179) and L60 (180).			
4.1.8.18	Running W/Delay. Terminals L35 (175) and L36 (176).			
4.1.8.19	Ready to Load - HVAC System. Terminals L9 (137) and L10 (138).			
4.1.8.20	Ready to Load - Spare. Terminals L11 (139) and L12 (140).			
4.1.8.21	Emergency Stop. Terminals L14 (336) and L15 (337).			
4.1.8.22	ERF Computer. Terminals L49 (S4B1) and L50 (S4B2).			
4.1.8.23	Emergency Stop Annunciation. Terminals L25 (79-180) and L26 (90-180).			
4.1.8.24	CC Fan #1. Terminals C3 (244) and C9 (245).			
4.1.8.25	CC Fan #2. Terminals C5 (246) and C11 (247).			
4.1.8.26	Generator Space Heater Control. Terminals C7 (239) and C8 (240).			
4.1.8.27	Running Contacts. Terminals G3 (253), G4 (254), G5 (255), G6 (256), G7 (257), G8 (258), G9 (259), G10 (260), G11 (161), and G12 (162).	RAT 3/29/90		

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.1.8.28	Running W/Delay Contacts. Terminals G13 (263), G14 (264), G15 (265), G16 (266), G17 (267), G18 (268), G19 (269), G20 (270), G21 (271), G22 (272), G23 (273) and G24 (274).	RAJ 13/24/90	No	JCH-13/24/90
4.1.8.29	Loss of DC Annunciation. Terminals H1 (275) and H2 (276).			
4.1.8.30	Mechanical Trouble Alarm. Terminals H19 (298) and H20 (299).			
4.1.8.31	Lockout Alarm. Terminals H3 (277) and H4 (278).			
4.1.8.32	Failed to Start. Terminals H7 (281) and H8 (282).			
4.1.8.33	Unit Available Local Control. Terminals H9 (283) and H10 (284).			
4.1.8.34	Unit Available. Terminals H11 (285), H12 (286), H13 (287), H14 (288), H15 (289), and H16 (290).			
4.1.8.35	Alarm. Terminals H17 (296) and H18 (297).			
4.1.8.36	Loss of DC Power. Terminals A35 (612) and A36 (613).			
4.1.8.37	DG Brkr Inop. Terminals F7 (79) and F8 (80).			
4.1.9	Toggle switches to hourmeter open.	RAJ 13/24/90		

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.1.10.1	At on-engine "EJBA" Junction Box, disconnect engine wire number 4 and tape wire end.	RAJ 3/29/90	No	JCH 3/28/90
4.1.11.1	At on-engine "EJBB" Junction Box, disconnect engine wire number 105 and tape wire end.	RAJ 3/29/90		
4.1.12	Verify that all circuit breakers are closed.	RAJ 3/29/90		
4.1.13	Verify 60 psi at control air pressure gauge.	RAJ 3/29/90	QC HOLD POINT	JCH 3/28/90
4.1.14	Verify 125 vdc across circuit breakers CB-1 and CB-2, CB-3 and CB-4.	RAJ 3/29/90	QC HOLD POINT	JCH 3/28/90
4.2.1	Jumper terminals L45 (101) and L48 (129), Control Room permissive for maintenance mode.	N/A WP 3/28/90		
4.2.2.1	Disconnect jumper across terminals H4 (278) and H12 (286) and verify:			
4.2.2.2	Open contact across terminals H3 (277) and H4 (278).			
4.2.2.3	Contact OPEN			
4.2.2.4	Contact OPEN			N/A JCH 3/28/90
4.2.2.5	Contact CLOSED			
4.2.2.6	Contact CLOSED			
4.2.3.1	Shutdown Cylinder EXTENDED			
4.2.3.2	Lockout alarm ENERGIZED			

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.3.3	Light De-Energized	N/A CSP 3/28/89		
4.2.3.4	Gauge indicates 0 PSI			
4.2.3.5	Lockout Pin REMOVED			
4.2.3.6	STOPPING light ENERGIZED			
4.2.3.7	Contact CLOSED			
4.2.3.8	Contact CLOSED			
4.2.3.9	Contact CLOSED			
4.2.3.10	Contact CLOSED			
4.2.3.11	Contact OPEN			
4.2.3.12	Contact OPEN			
4.2.4	Jumper Removed	N/A		3/28/89
4.2.5.1	125VDC present			
4.2.6.1	No voltage present			
4.2.6.2	No voltage present			
4.2.7	Wire disconnected			
4.2.7.1	Relay R-35 De-energized			
4.2.7.2	Contact OPEN			
4.2.7.3	Lockout alarm de-energized			
4.2.8.1	Barring device engaged alarm ENERGIZED			

Sheet 7 of 30

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.8.2	Contact CLOSED	N/A 3/28/90		
4.2.8.3	Relay R-35 ENERGIZED			
4.2.9.1.1	125VDC Present			
4.2.9.2.1	No voltage present			
4.2.9.2.2	No voltage present			
4.2.10.1	Barring device engaged alarm ENERGIZED			
4.2.10.2	Contact OPEN			
4.2.10.3	Relay R-35 DE-ENERGIZED			
4.2.11	Wire Reconnected			N/A 3/28/90
4.2.11.1	Relay R-35 DE-ENERGIZED			
4.2.11.2	Lockout alarm ENERGIZED			
4.2.12.1	Shutdown cylinder RETRACTED			
4.2.12.2	Pressure Gauge reads 60PSI			
4.2.12.3	Lockout alarm DE-ENERGIZED			
4.2.12.4	Emergency status light ENERGIZED			
4.2.12.5	Lockout pin in LOCKED position			
4.2.12.6	STOPPING light DE-ENERGIZED			

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.12.7	BARRING device RETRACTED	N/A CLP 3/28/90		
4.2.12.8	Locking pin INSTALLED			
4.2.13.1	No voltage PRESENT			
4.2.14.1	No voltage PRESENT			
4.2.14.2	"A" power light DE-ENERGIZED			
4.2.14.3	Panel "A" failure alarm ENERGIZED			
4.2.14.4	Contact CLOSED		N/A	JCH 3/28/90
4.2.15	Timer REMOVED			
4.2.16.1	125VDC PRESENT			
4.2.16.2	Alarm ENERGIZED			
4.2.16.3	Relay DE-ENERGIZED			
4.2.16.4	Contact CLOSED			
4.2.16.5	Contact CLOSED			
4.2.16.6	Relay R-35 ENERGIZED			
4.2.16.7	Horn ENERGIZED			
4.2.17.1	Horn DE-ENERGIZED			
4.2.17.2	Contact OPEN			
4.2.17.3	Relay R-35 DE-ENERGIZED			

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.17.4	Failed to start alarm DE-ENERGIZED	N/A CW 3/28/90		
4.2.18.1	Contact CLOSED			
4.2.18.2	Contact CLOSED			
4.2.18.3	No voltage PRESENT			
4.2.18.4	Contact CLOSED			
4.2.18.5	Contact CLOSED			
4.2.18.6	Running light ENERGIZED			
4.2.18.7	Failed to start alarm DE-ENERGIZED			
4.2.18.8	Contact CLOSED			
4.2.18.9	Contact OPEN			
4.2.18.10	Contact CLOSED			
4.2.18.11	Relay R 1 ENERGIZED	N/A CW 3/28/90		
4.2.18.12	Contact CLOSED			
4.2.18.13	Contact CLOSED			
4.2.18.14	Contact CLOSED			
4.2.18.15	Contact CLOSED			
4.2.18.16	Contact OPEN			
4.2.18.17	Contact OPEN			
4.2.18.18	Contact OPEN			
4.2.18.19	Contact CLOSED			
4.2.18.20	Contact CLOSED			

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.18.21	Contact CLOSED	N/A CJP 3/29/90		
4.2.18.22	Contact OPEN			
4.2.18.23	Contact OPEN			
4.2.18.24	Contact OPEN			
4.2.19	Maintenance Button Pushed			
4.2.19.1	Maintenance mode alarm DE-ENERGIZED			
4.2.20.1	Contact OPEN			N/A PCH 3/29/90
4.2.20.2	Shutdown cylinder EXTENDED			
4.2.20.3	Cylinder retracted and VENTED			
4.2.20.4	Contact OPEN			
4.2.20.5	Contact CLOSED			
4.2.20.6	Unit running light DE-ENERGIZED			
4.2.20.7	Contact OPEN			
4.2.20.8	Contact OPEN			
4.2.20.9	Contact OPEN			
4.2.21.1	Maintenance mode alarm ENERGIZED			
4.2.22.1	Maintenance mode alarm DE-ENERGIZED			
4.2.24.1	125VDC PRESENT	DJP 3/29/90	QC HOLD POINT	PCH 3/29/90
4.2.24.2.1	Maintenance mode alarm DE-ENERGIZED	PAJ 3/29/90	No	PCH 3/29/90

P324/90

P03443

Sheet 11 of 30

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.24.3	Contact CLOSED	RAJ 3/27/90	QC HOLD POINT	JCW 3/28/90 3/29/90
4.2.24.4	Relays ENERGIZED	RAJ 3/27/90	QC HOLD POINT	JCW 3/28/90
4.2.24.5	Contact CLOSED	RAJ 3/27/90	QC HOLD POINT	JCW 3/28/90
4.2.24.6	Safety injection signal light ENERGIZED	RAJ 3/27/90	QC HOLD POINT	JCW 3/28/90
4.2.24.7	Shutdown light DE-ENERGIZED	RAJ 3/27/90	QC HOLD POINT	JCW 3/28/90
4.2.24.8	No voltage on solenoid	RAJ 3/27/90	QC HOLD POINT	JCW 3/28/90
4.2.24.9	Jumper REMOVED	RAJ 3/27/90	QC HOLD POINT	JCW 3/28/90
4.2.24.10	EMERGENCY start alarm ENERGIZED	RAJ 3/27/90	NO	JCW 3/28/90
4.2.24.11	Contact CLOSED	RAJ 3/27/90		
4.2.24.12	Contact CLOSED	N/A C10 3/28/90		
4.2.25.1	Stopping light DE-ENERGIZED	N/A C8 3/28/90		
4.2.26.1	Pressure gauge below 25 PSI	RAJ 3/27/90		
4.2.26.2	Shutdown cylinder NOT EXTENDED	RAJ 3/27/90		
4.2.26.3	Hi temp lube oil alarm ENERGIZED	RAJ 3/27/90	QC HOLD POINT	JCW 3/28/90
4.2.26.4	Stopping light NOT ENERGIZED	RAJ 3/27/90	NO	JCW 3/28/90
4.2.26.5	Contact CLOSED	RAJ 3/27/90		
4.2.26.6	Contact CLOSED annunciator "ON"	N/A C10 3/28/90		
4.2.27	Tubing E-18 RECONNECTED	N/A C8 3/28/90		
		RAJ 3/29/90	QC HOLD POINT	JCW 3/29/90

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.27.1	Group 1 pressure gauge 60 PSI	RAJ 3/29/90	QC HOLD POINT	[illegible] 3/29/90
4.2.27.2	Hi temp alarm DE-ENERGIZED	RAJ 3/29/90	QC HOLD POINT	[illegible] 3/29/90
4.2.27.3	Contact OPEN	N/A CJP 3/28/90	No	[illegible] 3-28-90
4.2.27.4	Contact OPEN	N/A CJP 3/28/90	↓	↓
4.2.28.1	Stopping light ENERGIZED	RAJ 3/29/90	QC HOLD POINT	[illegible] 3/29/90
4.2.28.2	Lo pressure alarm ENERGIZED	RAJ 3/29/90	QC HOLD POINT	[illegible] 3/29/90
4.2.28.3	Contact CLOSED	N/A CJP 3/28/90	No	[illegible] 3-28-90
4.2.28.4	Contact CLOSED	N/A CJP 3/28/90	↓	↓ -1
4.2.28.5	Engine shutdown Cylinder EXTENDED	RAJ 3/29/90	QC HOLD POIN.	[illegible] 3-29-90
4.2.29.1	Maintenance mode alarm DE-ENERGIZED	RAJ 3/29/90	No	[illegible] 3-28-90
4.2.30	Plug installed on E-92	RAJ 3/29/90	QC HOLD POINT	[illegible] 3-29-90
4.2.30.1	Relay R11B ENERGIZED	RAJ 3/29/90	QC HOLD POINT	[illegible] 3-29-90
4.2.30.1.1	Contact CLOSED	N/A CJP 3/28/90	No	[illegible] 3-28-90
4.2.30.1.2	Contact CLOSED	↓	↓	↓
4.2.30.1.3	Contact CLOSED	↓	↓	↓
4.2.30.1.4	Ready to load light ENERGIZED	RAJ 3/29/90	QC HOLD POINT	[illegible] 3-29-90
4.2.30.2	Jumper Removed	RAJ 3/29/90	No	[illegible] 3-28-90
4.2.30.2.1	Contact OPEN	RAJ 3/29/90	↓	↓
4.2.30.2.2	Contact OPEN	RAJ 3/29/90	↓	↓

Sheet 13 of 30

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.30.2.3	Contact OPEN	N/ACSP 13/28/90	No	[illegible] 13/28/90
4.2.30.2.4	Ready to load light DE-ENERGIZED RAJ 3-29-90	RAJ 13/29/90	OC HOLD POINT	[illegible] 13-29-90
4.2.31.1	No voltage PRESENT	RAJ 13/29/90	OC HOLD POINT	[illegible] 13-29-90
4.2.31.2	Relay R-5B ENERGIZED	RAJ 13/29/90	OC HOLD POINT	[illegible] 13-29-90
4.2.32.1	Relay R-23B ENERGIZED	RAJ 13/29/90	OC HOLD POINT	[illegible] 13 29-90
4.2.32.2	Contact CLOSED	N/ACSP 13/28/90	No	[illegible] 13/28/90
4.2.32.3	Contact CLOSED			
4.2.32.4	Contact CLOSED			
4.2.32.5	Contact CLOSED			
4.2.32.6	Emergency Stop ENERGIZED	RAJ 13/29/90		
4.2.32.7	Stopping light ENERGIZED	RAJ 13/29/90		
4.2.32.8	Pressure at Solenoid 3B	RAJ 13/29/90		
4.2.32.9	Unit available light DE-ENERGIZED	RAJ 13/29/90		
4.2.32.9.1	No change in status light	RAJ 13/29/90		
4.2.32.10	Overspeed alarm ENERGIZED	RAJ 13/29/90		
4.2.32.11	Contact CLOSED	N/ACSP 13/28/90		
4.2.32.12	Relay R-3S ENERGIZED	RAJ 13/29/90	OC HOLD POINT	[illegible] 13-29-90
4.2.32.12.1.1	Relay R-3S ENERGIZED	RAJ 13/29/90	OC HOLD POINT	[illegible] 13 29-90
4.2.32.12.1.2	Emergency trip DE-ENERGIZED	RAJ 13/29/90	OC HOLD POINT	[illegible] 13-29-90

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.32.13.1	No voltage present	RAJ 3-27-90	No	[illegible] 13/28/90
4.2.32.13.2	No voltage present	RAJ 3-27-90		
4.2.33	Cover INSTALLED	RAJ 3-27-90		
4.2.35.1	Contact OPEN	N/A CJC 3/29/90		
4.2.35.2	Overspeed trip DE-ENERGIZED	RAJ 3-27-90	QC HOLD POINT	[illegible] 13-29-90
4.2.35.3	Contact OPEN	N/A CJC 3/28/90	No	[illegible] 13/28/90
4.2.36.1	Relay R23B DE-ENERGIZED	RAJ 3-27-90	QC HOLD POINT	[illegible] 13-29-90
4.2.36.2	Contact OPEN	N/A CJC 3/28/90	No	[illegible] 13-28-90
4.2.36.3	Contact OPEN			
4.2.36.4	Contact OPEN			
4.2.36.5	Emergency stop light DE-ENERGIZED	RAJ 3/29/90	QC HOLD POINT	[illegible] 3-29-90
4.2.36.6	Stopping light DE-ENERGIZED	RAJ 3/29/90	QC HOLD POINT	[illegible] 3-29-90
4.2.36.7	Relay R-35 DE-ENERGIZED	RAJ 3/29/90	QC HOLD POINT	[illegible] 3-29-90
4.2.37.1	125VDC present	RAJ 3/29/90	QC HOLD POINT	[illegible] 3-29-90
4.2.37.2	DG Auto start signal ENERGIZED	RAJ 3/29/90	QC HOLD POINT	[illegible] 3-29-90
4.2.38.1	No voltage present	RAJ 3/29/90	No	[illegible] 13-28-90
4.2.38.2	DG Auto start signal DE-ENERGIZED	RAJ 3/29/90		
4.2.39.1	Contact CLOSED	N/A CJC 3/29/90		
4.2.29.2.1	Relay R23B ENERGIZED	DJP 3/29/90	QC HOLD POINT	[illegible] 3-29
4.2.39.2.2	Contact CLOSED	N/A CJC 3/29/90	No	[illegible] 13-28-90

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.39.2.3	Contact CLOSED	N/A CSP 3/28/90	NO	JCW 3/28/90
4.2.41.1	Emergency trip alarm is ENERGIZED	DSP 3/29/90	QC HOLD POINT	JCW 3-29-90
4.2.41.2	Contact CLOSED	N/A CSP 3/28/90	NO	JCW 3/28/90
4.2.41.3	Relay R-35 ENERGIZED	DSP 3/29/90	QC HOLD POINT	JCW 3-29-90
4.2.42.1	Emergency trip alarm DE-ENERGIZED	DSP 3/29/90	QC HOLD POINT	JCW 3-29-90
4.2.42.2	Contact OPEN	N/A CSP 3/28/90	NO	JCW 3/28/90
4.2.42.3	Relay R-35 DE-ENERGIZED	DSP 3/29/90	QC HOLD POINT	JCW 3-29-90
4.2.44	Jumper Disconnected	DSP 3/28/90	NO	JCW 3/28/90
4.2.45.1	125VDC across solenoid 202-6A	N/A CSP 3/28/90		
4.2.45.2	Power available light ENERGIZED			
4.2.45.3	Annunciator DE-ENERGIZED			
4.2.45.4	Contact OPEN			
4.2.46.1	No voltage across solenoid 202-6B	DSP 3/29/90		
4.2.46.2	Power available light DE-ENERGIZED	DSP 3/29/90		
4.2.46.3	Power "B" failure ALARM ENERGIZED	DSP 3/29/90		
4.2.46.4	CONTACT CLOSED	N/A CSP 3/28/90		
4.2.48.1	125VDC PRESENT	DSP 3/29/90	QC HOLD POINT	JCW 3-29-90
4.2.48.2	FAILURE TO START ALARM ENERGIZED	DSP 3/29/90	QC HOLD POINT	JCW 3-29-90

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.49.1	No voltage present	DJP 13/29/90	QC HOLD POINT	JCH 13-29-90
4.2.49.2	CONTACT CLOSED	N/A CJP 13/28/90		
4.2.49.3	OPEN CIRCUIT			N/A JCH 3/28/90
4.2.49.4	CONTACT CLOSED			
4.2.49.4	CONTACT CLOSED			
4.2.49.5	STARTING LIGHT ENERGIZED	DJP 3/29/90	QC HOLD POINT	JCH 1329-90
4.2.49.6	Relay R1 ENERGIZED	DJP 13/29/90	QC HOLD POINT	JCH 13-29-90
4.2.49.7	RUNNING LIGHT ENERGIZED	DJP 13/29/90	QC HOLD POINT	JCH 13-29-90
4.2.50.1	SHUTDOWN CYLINDER EXTENDED	DJP 13/29/90	QC HOLD POINT	JCH 13-29-90
4.2.50.2	Contact Closure	N/A CJP 13/28/90	No	JCH 3/28/90
4.2.50.3	High Temperature trip ENERGIZED	DJP 13/29/90		
4.2.50.4	OPEN CIRCUIT	N/A CJP 13/28/90		
4.2.50.5	Relay R1, R1AUX, and R2 are reset	DJP 13/29/90		
4.2.50.6	Contact Closed	N/A CJP 13/28/90		
4.2.50.7	Contact closed			
4.2.50.8	Unit running light DE-ENERGIZED	DJP 13/29/90		
4.2.50.9	Stopping light ENERGIZED	DJP 13/29/90		
4.2.50.10	Contact CLOSED	N/A CJP 13/28/90		
4.2.50.11	CONTACT CLOSED			
4.2.51.1	Hi bearing temp ALARM DE-ENERGIZED	DJP 13/29/90	QC HOLD POINT	JCH 13/29/90

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.51.2	CONTACT OPEN	N/A CLP 3/29/90	No	[illegible] 3/29/90
4.2.51.3	CONTACT OPEN	↓	↓	↓
4.2.53.1	125V DC PRESENT	DJP 3/29/90	QC HOLD POINT	[illegible] 3-29-90
4.2.53.2	CONTACT CLOSED	N/A CLP 3/29/90	No	[illegible] 3/29/90
4.2.53.3	RELAYS R1, R1A R2, ENERGIZED	DJP 3/29/90		
4.2.53.4	SHUTDOWN SYSTEM ACTIVE Light DE-ENERGIZED	DJP 3/29/90		
4.2.53.5	NO VOLTAGE PRESENT	DJP 3/29/90		
4.2.53.6	Jumper Removed	DJP 3/29/90		
4.2.53.7	Contact CLOSED	N/A CLP 3/29/90		
4.2.54.1	Hi Pressure Alarm ENERGIZED	DJP 3/29/90		
4.2.54.2	ENGINE SHUTDOWN CYLINDER NOT EXTENDED	DJP 3/29/90		
4.2.54.3	CONTACT CLOSED	N/A CLP 3/29/90		
4.2.54.4	CONTACT CLOSED	↓	↓	↓
4.2.55	TUBING E-68 RECONNECTED	DJP 3/29/90	QC HOLD POINT	[illegible] 3-29-90
4.2.55.1	Hi Pressure Alarm DE-ENERGIZED	DJP 3/29/90	QC HOLD POINT	[illegible] 3-29-90
4.2.55.2	CONTACT OPEN	N/A CLP 3/29/90	No	[illegible] 3/29/90
4.2.55.3	CONTACT OPEN	↓	↓	↓
4.2.55.4	SHUTDOWN CYLINDER NOT EXTENDED	DJP 3/29/90	QC HOLD POINT	[illegible] 3-29-90
4.2.56.1	No voltage present	DJP 3/29/90	ND	[illegible] 3/29/90

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.56.2	CONTACT CLOSED	N/A CJP 13/28/90	No	[illegible] 13/28/90
4.2.56.3	SHUTDOWN CYLINDER EXTENDED	DJP 3/29/90		
4.2.56.4	VIBRATION ALARM ENERGIZED	DJP 3/29/90		
4.2.56.5	CONTACT CLOSED	N/A CJP 13/28/90		
4.2.56.6	CONTACT CLOSED			
4.2.56.7	CONTACT OPEN			
4.2.57	TUBING E-23-H RECONNECTED	DJP 13/29/90	QC HOLD POINT	[illegible] 13/29/90
4.2.57.1	VIBRATION ALARM DE-ENERGIZED	DJP 13/29/90	QC HOLD POINT	[illegible] 13/29/90
4.2.57.2	CONTACT OPEN	N/A CJP 13/28/90	No	[illegible] 13/28/90
4.2.57.3	CONTACT OPEN			
4.2.58.1	Jacket Water Lo PRESSURE ENERGIZED	DJP 13/29/90		
4.2.58.2	ENGINE SHUTDOWN CYLINDER EXTENDED	DJP 13/29/90		
4.2.58.3	CONTACT CLOSED	N/A CJP 13/28/90		
4.2.58.4	CONTACT CLOSED			
4.2.58.5	CONTACT CLOSED			
4.2.58.6	CONTACT CLOSED			
4.2.58.7	CONTACT CLOSED			
4.2.59	TUBING E-14 RECONNECTED	DJP 13/29/90	QC HOLD POINT	[illegible] 13-29-90
4.2.59.1	JACKET WATER ALARM DE-ENERGIZED	DJP 13/29/90	QC HOLD POINT	[illegible] 13-29-90

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.59.2	CONTACT OPEN	N/A CJP 1/28/20		
4.2.59.3	CONTACT OPEN			
4.2.60.1	RELAY R-11A ENERGIZED			
4.2.60.2	CONTACT CLOSED			
4.2.60.3	CONTACT CLOSED			
4.2.60.4	READY TO LOAD LIGHT ENERGIZED			
4.2.60.5	CONTACT OPEN			
4.2.60.6	CONTACT OPEN			
4.2.60.7	READY TO LOAD LIGHT DE-ENERGIZED			N/A 1/30/20
4.2.60.8	JUMPER REMOVED			
4.2.61.1	125VDC PRESENT			
4.2.61.2	CONTACT CLOSED			
4.2.61.3	AUTO START LIGHT ENERGIZED			
4.2.62	REMOVE JUMPER			
4.2.62.1	NO VOLTAGE PRESENT			
4.2.62.2	CONTACT OPEN			
4.2.62.3	AUTO START			
4.2.63.1	UNIT AVAILABLE LIGHT DE-ENERGIZED			
4.2.63.2	POWER FAILURE ALARM ENERGIZED			
4.2.63.3	CONTACT CLOSED			

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.64.1	UNIT AVAILABLE STATUS LIGHT ENERGIZED	DJP 3/29/00	OC HOLD POINT	JW 3-29-00
4.2.64.2	START POWER FAILURE ALARM DE-ENERGIZED	DJP 3/29/00	OC HOLD POINT	JW 3-29-00
4.2.64.3	CONTACT OPEN	N/A C1P 3/28/00	No	JW 3/28/00
4.2.65.1	PRESSURE SENSOR MALFUNCTION ALARM ENERGIZED	DJP 3/29/00		
4.2.65.2	CONTACT CLOSED	N/A C1P 3/28/00		
4.2.65.3	TUBING E-10B DISCONNECTED	DJP 3/29/00		
4.2.65.4	LUBE OIL ALARM ENERGIZED	DJP 3/29/00		
4.2.65.5	PRESSURE SENSOR MALFUNCTION ALARM DE-ENERGIZED	DJP 3/29/00		
4.2.65.6	CONTACT CLOSED	N/A C1P 3/28/00		
4.2.65.7	CONTACT CLOSED			
4.2.65.8	CONTACT OPEN			
4.2.65.9	RELAY R23B DEENERGIZED	DJP 3/29/00		
4.2.66.1	RELAY R23B DEENERGIZED	DJP 3/29/00	OC HOLD POINT	JW 3-29-00
4.2.66.2	CONTACT OPEN	N/A C1P 3/28/00	No	JW 3/28/00
4.2.66.3	CONTACT OPEN			
4.2.67.1	MALFUNCTION ALARM ENERGIZED	DJP 3/29/00		
4.2.67.2.	PLUG REMOVED FROM TUBING E-10C	DJP 3/29/00		

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.67.2.1	LO OIL PRESSURE ALARM DE-ENERGIZED	DJP 13/29/90	No	[illegible] 13/28/90
4.2.67.2.2	LUBE OIL SHUTDOWN ALARM ENERGIZED	DJP 13/29/90		
4.2.67.2.3	CONTACT CLOSED	N/A CJP 13/28/90		
4.2.69.1	MALFUNCTION ALARM ENERGIZED	DJP 13/29/90		
4.2.69.2	PLUG E-10A DISCONNECTED	DJP 13/29/90		
4.2.69.2.1	LUBE OIL SHUTDOWN ALARM ENERGIZED	DJP 13/29/90		
4.2.70	PLUGS RECONNECTED TO TUBING E10A and E10C	DJP 13/29/90		
4.2.71.1	JACKET WATER TEMP SENSOR MALFUNCTION ALARM ENERGIZED	DJP 13/29/90		
4.2.71.2	CONTACT CLOSED	N/A CJP 13/28/90		
4.2.71.3	Disconnect Tubing E-16B	DJP 13/29/90		
4.2.71.3.1	TEMP SENSOR MALFUNCTION ALARM DE-ENERGIZED	DJP 13/29/90		
4.2.71.3.2	JACKET WATER TEMP SHUTDOWN ALARM ENERGIZED	DJP 13/29/90		
4.2.71.3.3	CONTACT CLOSED	N/A CJP 13/28/90		
4.2.71.3.4	CONTACT OPEN	DJP 13/29/90		
4.2.72	TUBING E-16A and E-16B RECONNECTED	DJP 13/29/90	QC HOLD POINT	[illegible] 13-29-90
4.2.73	E16-B Disconnected	DJP 13/29/90	No	[illegible] 13/28/90

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.73.1	Hi Temp. JACKET WATER ALARM DE-ENERGIZED	DJP 3/29/90	NO	fcllt 3/29/90
4.2.73.2	CONTACT OPEN	N/A CJP 3/28/90		
4.2.73.3	CONTACT OPEN	↓		
4.2.73.4	TEMP. SENSOR MALFUNCTION ALARM	DJP 3/29/90		
4.2.73.5	TUBING E16-C Disconnected	DJP 3/29/90		
4.2.73.5.1	Jacket Water Shutdown ALARM ENERGIZED	DJP 3/29/90	↓	↓
4.2.74	TUBING LINES E16-B AND C RECONNECTED	DJP 3/29/90	QC HOLD POINT	TW 3-29-90
4.2.75	Disconnect Tubing E16-C	DJP 3/29/90	NO	fcllt 3/28/90
4.2.75.1	SENSOR MALFUNCTION ALARM	DJP 3/29/90		
4.2.75.2	TUBING E16-A Disconnected	DJP 3/29/90		
4.2.75.2.1	JACKETWATERS SHUTDOWN ALARM	DJP 3/29/90	↓	↓
4.2.76	TUBING E16-A and C RECONNECTED	DJP 3/29/90	QC HOLD POINT	TW 3-29-90
4.2.77.1	PRESSURE GAUGE READING LESS THAN 25PSI	DJP 3/29/90	QC HOLD POINT	TW 3-29-90
4.2.77.2	BYPASS TEST FAILURE LIGHT DE-ENERGIZED	DJP 3/29/90	QC HOLD POINT	TW 3-29-90
4.2.77.3.1	BYPASS TEST FAILURE LIGHT ENERGIZED	DJP 3/29/90	QC HOLD POINT	TW 3-29-90
4.2.78.1	SUMP TANK READING O.K.	N/A CJP 3/28/90	NO	fcllt 3/28/90

Sheet 23 of 30

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.79.1	DAY TANK READING O.K.	N/A CJC 12/3/90		
4.2.80.1	ALARMS ENERGIZED			
4.2.80.2	Horn Disconnected			
4.2.82.1	LUBE OIL FILTER DIFFERENTIAL HIGH FUNCTIONS			
4.2.82.1.1	ALARM FUNCTIONS Correctly			
4.2.82.1.2	RELAY R38 ENERGIZED			
4.2.82.1.3	CONTACT CLOSED			12/3/90
4.2.82.2.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.2.2	RELAY R38 ENERGIZED			
4.2.82.3.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.3.2	RELAY R38 ENERGIZED			
4.2.82.4.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.4.2	RELAY R38 ENERGIZED			
4.2.82.5.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.6.1	ALARM FUNCTION CORRECTLY			
4.2.82.7.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.8.1	ALARM FUNCTIONS CORRECTLY			

Sheet 24 of 30

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.82.9.1	ALARM FUNCTIONS CORRECTLY	N/A CR 12/28/90		
4.2.82.9.2	RELAY R38 ENERGIZED			
4.2.82.10.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.10.2	RELAY R38 ENERGIZED			
4.2.82.11.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.11.2	RELAY R38 ENERGIZED			
4.2.82.12.1	ALARM FUNCTIONS CORRECTLY			N/A CR 1/3/91
4.2.82.12.2	RELAY R38 ENERGIZED			
4.2.82.13.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.14.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.15.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.16.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.17.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.17.2	RELAY R35 ENERGIZED			
4.2.82.18.1	ALARM FUNCTIONS CORRECTLY			

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.82.19.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.20.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.20.2	RELAY R38 ENERGIZED			
4.2.82.21.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.22.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.22.2	RELAY R38 ENERGIZED			
4.2.82.23.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.23.2	RELAY R38 ENERGIZED			
4.2.82.24.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.25.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.26.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.26.2	RELAY R38 ENERGIZED			
4.2.82.27.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.27.2	RELAY R38 ENERGIZED			
4.2.82.28.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.28.2	RELAY R38 ENERGIZED			

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.82.29.1	ALARM FUNCTIONS CORRECTLY	N/ACN 1/28/90		/
4.2.82.29.2	RELAY R38 ENERGIZED	/		/
4.2.82.30.1	ALARM FUNCTIONS CORRECTLY	/		/
4.2.82.31.1	ALARM FUNCTIONS CORRECTLY	/		/
4.2.82.31.2	RELAY R20 ENERGIZED CONTACT CLOSED	/		/
4.2.82.32.1	ALARM FUNCTIONS CORRECTLY	/		/
4.2.82.33.1	ALARM FUNCTIONS CORRECTLY	/		/
4.2.82.33.2	EMERGENCY STATUS LIGHT DE-ENERGIZED	/		MA 1/28/90
4.2.82.34.1	ALARM FUNCTIONS CORRECTLY	/		/
4.2.82.35.1	ALARM FUNCTIONS CORRECTLY	/		/
4.2.82.35.2	CONTACT CLOSED	/		/
4.2.82.36.1	ALARM FUNCTIONS CORRECTLY	/		/
4.2.82.36.2	ALARM FUNCTIONS CORRECTLY	/		/
4.2.82.37.1	ALARM FUNCTIONS CORRECTLY	/		/
4.2.82.38.1	ALARM FUNCTIONS CORRECTLY	/		/
4.2.82.39.1	ALARM FUNCTIONS CORRECTLY	/		/

Sheet 27 of 30

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.82.40.1	ALARM FUNCTIONS CORRECTLY	N/A CJC 3/28/90		
4.2.82.41.1	ALARM FUNCTIONS CORRECTLY			
4.2.82.42	RELAYS INSTALLED			
4.2.83	RELAY RESET			
4.2.84.1	NO PRESSURE AT L.B. GAUGE			
4.2.84.2.1	120 VDC PRESENT			
4.2.84.3.1	120 VDC PRESENT			N/A 3/29/90
4.2.85.1	PRESSURE AT R.B.GAUGE			
4.2.85.2	NO PRESSURE AT LB GAUGE			
4.2.85.3.1	NO VOLTAGE PRESENT			
4.2.85.4.1	NO VOLTAGE PRESENT			
4.2.87.1	CONTACT CLOSED			
4.2.87.2	CONTACT CLOSED			
4.2.88.1	CONTACT OPEN			
4.2.88.2	CONTACT OPEN			
4.2.89.1	TUBING RECONNECTED	SL 3-29-90	QC HOLD POINT	TW 3-29-90
4.2.89.2	TUBING RECONNECTED		QC HOLD POINT	TW 3-29-90
4.2.89.3	TUBING RECONNECTED		QC HOLD POINT	TW 3-29-90
4.2.90	TUBING RECONNECTED		QC HOLD POINT	TW 3-29-90
4.2.91	TUBING RECONNECTED	SL 3-29-90	QC HOLD POINT	TW 3-29-90

Sheet 28 of 30

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.92.1	LINKS CLOSED	DJP 12/29/90	NO	[illegible] 12/29/90
4.2.92.2	LINKS CLOSED			
4.2.92.3	LINKS CLOSED			
4.2.92.4	LINKS CLOSED			
4.2.92.5	LINKS CLOSED			
4.2.92.6	LINKS CLOSED			
4.2.92.7	LINKS CLOSED			
4.2.92.8	LINKS CLOSED			
4.2.92.9	LINKS CLOSED			
4.2.92.10	LINKS CLOSED			
4.2.92.11	LINKS CLOSED			
4.2.92.12	LINKS CLOSED			
4.2.92.13	LINKS CLOSED			
4.2.92.14	LINKS CLOSED			
4.2.92.15	LINKS CLOSED			
4.2.92.16	LINKS CLOSED			
4.2.92.17	LINKS CLOSED			
4.2.92.18	LINKS CLOSED			
4.2.92.19	LINKS CLOSED			
4.2.92.20	LINKS CLOSED			
4.2.92.21	LINKS CLOSED			
4.2.92.22	LINKS CLOSED			

QC WITNESS POINT

[illegible] for Williams per IR 34172

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.92.23	LINKS CLOSED	DR 13/29/90	No	[illegible] 13/28/90
4.2.92.24	LINKS CLOSED			
4.2.92.25	LINKS CLOSED			
4.2.92.26	LINKS CLOSED			
4.2.92.27	LINKS CLOSED			
4.2.92.28	LINKS CLOSED			
4.2.92.29	LINKS CLOSED			
4.2.92.30	LINKS CLOSED			
4.2.92.31	LINKS CLOSED			
4.2.92.32	LINKS CLOSED			
4.2.92.33	LINKS CLOSED			
4.2.92.34	LINKS CLOSED			
4.2.92.35	LINKS CLOSED			
4.2.92.36	LINKS CLOSED			
4.2.92.37	LINKS CLOSED			
4.2.93	TOGGLE SWITCHES OPEN	[illegible] 13/29/90	No	[illegible] 13/28/90
4.2.94	ENGINE WIRE RECONNECTED	DR 13/29/90	QC HOLD POINT	[illegible] 13-29-90
4.2.95	ENGINE WIRE RECONNECTED	DR 13/29/90	QC HOLD POINT	[illegible] 13-29-90
4.2.96	WIRE 402 RECONNECTED	N/A GK 13/28/90	No	[illegible] 13/28/90
4.2.97	JUMPER REMOVE	DR 13/29/90		

PROCEDURE STEP	DESCRIPTION	MAINT. INIT/DATE	HOLD POINT (Yes/No)	QC INIT/DATE
4.2.98	JUMPER REMOVE	DJP 13/29/90	NO	JCH 3/28/90
4.2.99	FREQUENCY GENERATOR REMOVED	DJP 13/29/90		
4.2.100	EQUIPMENT RESTORED TO OPERATIONAL CONDITION	RAJ 3-29-90		
4.2.101	SHIFT SUPERVISOR NOTIFIED	RAJ 3-29-90		

Comments/Additional Hold Points T.R. 24/72

QC has reviewed this procedure for Hold Points J.C. Harris 3-28-90
SIGNATURE

APPROVED (X) DISAPPROVED ( ) FOREMAN	DATE
	3-29-90

COMPLETED BY	DATE
	3-29-90