1	
i	TEMPORARY CHANGE TO PROCEDURE FORM
	TCP No. 13/45-1-20-90-1 Expiration Date 4-7-90
	Page / of 45 Required Final Approval Date 4-7-90
1	PROCESURE IN 13 LICE I
	PROCEDURE TITLE Diesel Generation FOR INFORMATION
1	DEPARTMENT OPERATORS
1	CHANGE IS RECOMMENDED TO BE MADE PERMANENT. YES
	REASON FOR CHANGE: Attachment 1 to license NDE XI TO Disease
	Explored to the states - Emines wall be relied over
	Hart unless that star foccurs within 4 hours of a Enutdown.
	ADD TO 4.1.2, 2 & 4.1.3.2 Cylinder moisture chicks are
	not required if the DG is started within 4 hours of a
1	shutdown.
1	
1	
1	
ŀ	
	ORIGINATOR James Righteries DATE 3/240
l	INTERIM APPROVAL ONLY IF NO CHANGE OF INTENT IS INVOLVED
ŀ	COGNIZANT SUPV.: APPROVE DISAPPROVE
l	OSOS: APPROVE DISAPPROVE TOLUNG SIGNATURE DATE
1	SIGNATURE 3/24/97
1	FINAL APPROVAL PRB REVIEW REQUIRED YES NO
	CHANGE IS TO BE MADE PERMANENT
	AND PROCEDURE WRITER ASSIGNED: YES NO
Ī	RESP. DEPT. HEAD: APPROVE V DISAPPROVE
	SIGNATURE DATE
ŀ	PRB RECOMMEND APPROVE DISAPPROVE
1	
ŀ	PRE CHAIRMAN MIG NO. DATE
	GENERAL MANAGER: APPROVE DISAPPROVE
	SIGNATURE DATE
PPS	202190489 920116 DR ADDCK 05000424 PDR
-	T MR

ROUTING OF TCP

- 1. ORIGINATOR Prepares TCP, mark-up procedure in BLACK.
- COGNIZANT SUPV. Reviews TCP, if approves, forwards to OSOS.
- 3. OEOS Reviews for Change of Intent. If approved, forwards to Shift Clerk.
- 4. SHIFT CLERK Assigns TCP #, makes log entries, makes copy for user, forwards original to cognizant supervisor.
- 5. COGNIZANT SUPERVISOR Makes working copy for use, send copy of interim approved TCP to Document Control, forwards original to responsible department manager/superintendent.
- 6. DEPT. MGR/SUPT. Reviews and approves. If permanent change, assigns responsibility to revise procedure. If PRB not required, makes copy for department file and forwards original to Document Control. If PRB required, forwards to PRB secretary.
- 7. PRB Reviews and recommends approval. Forwards to GMNP.
- 8. GMNP Reviews and approves, forwarding to the responsible department manager..
- 9. Dept. Manager/Superintendent Retains copy and forwards the original to Document Control.
- Document Control Removes interim copy and files final copy.

DISTRIBUTION

- 1. Working copy for originator
- 2. Document Control

FIGURE la

Appro	va.	3	9
(No	1	
0	u	SH	
Date			
100	-	A -	

Vogtle Electric Generating Plant

NUCLEAR OPERATIONS



Procedure No. 13145-1

Revision No.

20

Page No. 1 of 43

Unit 1

Georgia-Power

DO NOT USE AFTER -17190

DIESEL GENERATORS

MANUAL SET

1.0 PURPOSE

This procedure provides instructions for the operation of the Diesel Generators. This procedure should be used for maintenance troubleshooting or maintenance testing. Operability of the Diesel Generator is proven using 14980-1, "Diesel Generator Operability Test". Specific instructions are provided in the following subsections:

- 4.1.1 Preparing Train A(B) Diesel Generator For Automatic Operation
- 4.1.2 Local Startup Of Train A(B) Diesel Generator
- 4.1.3 Startup Of Train A(B) Diesel Generator From The Control Room
- 4.3.1 Stopping Train A(B) Diesel Generator
- 4.4.1 Cylinder Moisture Check
- 4.4.2 Emergency Stopping Train A(B) Diesel Generator
- 4.4.3 Diesel Generator Operation Under LOCA Conditions
- 4.4.4 Adding Lube Oil To The Diesel Generator Sump
- 4 4.5 Switching From In-Service Lube Oil Filter To Standby Filter With Diesel Generator In Operation.
- 4.4.6 Switching From In-Service Fuel Oil Filter To Standby Filter With Diesel Generator In Operation.
- 4.4.7 Switching From In-Service Fuel Oil Strainer
 To Standby Strainer With Diesel Generator In
 Operation
- 4.4.8 Generator Failure During Loss of Offsite Power

PROCEDURE NO.		REVISION	PAGE NO.
VEGP	13145-1	20	2 of 43
2.0	PRECAUTIONS	S AND LIMITATIONS	
2.1	PRECAUTIONS	3	
2.1.1	resistance	enerator must be taken ou to engine rotation is en the Pneumatic Barring Dev	countered while
2.1.2	Relays are	ing Diesel Generator Elec bypassed during a Normal erator is not paralleled	Start whom the
	a. Revers	se Power 132,	
	b. Underf	frequency 181,	
	c. Negati	ve Phase Sequence 146.	
2.1.3	Start condi	ing under actual Safety tions, the only active D devices are:	Injection Emergency iesel Generator
	a. Genera	tor Differential 187A, B	, c,
	b. Low Lu	be Oil Pressure,	
	c. High J	acket Water Temperature,	
	d. Engine	Overspeed.	
2.1.4	heaters and	l and Jacket Water Keep-Withe Generator Space Hear Thenever a Diesel Generator tartup.	ter should be
2.1.5	The governo should not	r Load Limit, Speed or Speed altered unless:	peed P up settings
	a. Raquir	ed by an approved test pr	rocedure, or
	b. The To	rque Seal has been damage	ed or broken.
	00350-C, "M	ance Department should be aintenance Program" to ma to the governor settings	ake any changes or
2.1.6	additional	el Generator is in contin supplies of fuel oil shall fifth day of continuous of	ll be ordered on or

PROCEDURE NO.		REVISION	PAGE NO.
VEGP	13145-1	20	3 of 43
		19	
2.1.7	The emerger peaking ser	ncy Diesel Generators shall	1 not be used for
2.1.8	1-HS-4516 (sel Generator is being ope ode never transfer the LOC (4517) on PDG1 (PDG3) to I nor and voltage regulator	AL-REMOTE Switch
2.1.9	power grid	esel Generator is paralle the kVAR load should be m one half of the kilowatt l	mintained Off and
2.1.10	time. This	Generators should not be the the offsite grid for p is to keep disturbances he Diesel Generators.	rolanged noriade of
2.1.11	Only one Di except duri	esel Generator should be ng emergency conditions.	operated at a time.
2.2	LIMITATIONS		
2.2.1	A Diesel Ge signal from conditions	nerator will not accept a the Control Room if any exist:	n Emergency Start of the following
	a. Local/(PDG3)	Remote Switch 1-HS-4516 (is in LOCAL,	4517) at PDG1
	b. Starti than 1	ng air pressure in both a 50 psig,	ir headers is less
	c. Engine	controls are in the main	tenance mode,
	d. Emerge	ncy Stop circuit energize	d,
		eed trip not reset.	

A Diesel Generator Emergency Start is initiated by closure of the Train A or B Engineered Safety Feature Safety Injection contacts or operation of the manual break-glass station at the Engine Control Panel. All other Diesel Generator start signals are considered to be a Normal Start.

- 2.2.2 The following Diesel Engine shutdown signals are bypassed during an Emergency Start:
 - a. High crankcase pressure,
 - b. High engine/turbocharger vibration,
 - c. Low turbocharger oil pressure,
 - d. High engine bearing temperature.
 - e. High engine lube oil temperature,
 - f. Low jacket water ressure.
- 2.2.3 The rated capacity of a Diesel Generator is 7000 kW, load should not be permitted to exceed 7000 kW during testing unless specifically required by the test procedure. A 10% overload of 7700 kW is allowed for 2 hours during emergency operation.
- 2.2.4 The Diesel Generators should not be operated at less than 30% load (2100 kW) for prolonged periods of time.
- 2.2.5 If prolonged operation at less than 30% load cannot be avoided, the Diesel Generator should be loaded to 50% (3500 kW) for a 2 hour period for each 24 hour period of low or no-load operation.
- 2.2.6 The Diesel Generators can operate at full load for 3 minutes with no Nuclear Service Cooling Water (NSCW) flow. If NSCW flow is not established within 3 minutes to a running Diesel Generator, the Diesel Generator should be tripped.
- 2.2.7 The pneumatic engine barring device will only operate when the engine is in the MAINTENANCE mode and must be disengaged before the engine can return to the OPERATION mode.

POCEDURE NO.	121/6 1	REVISION	PAGE NO.
VEGP	13145-1	20	5 of 43
2.2.8	the Diesel Start signa signal or t the depleti stopping li	Generator will only 1 generated by a Same local break glass on of starting air, ght is OFF (approximate)	erator shutdown signals s. During this period, respond to an Emergency fety Injection Actuation s station. To preclude wait until local red mately 90 seconds) after g to start the diesel
2.2.9	Supervisor'	is, shall be logged	pebook. The log entry
	a. Start	time,	
	b. Reason	for start,	
	c. Succes	s or failure of the	start attempt.
2.2.10	Two separat operable in specificati	Modes 1.2.3, and 4.	esel Generators shall b
2.2.11	One Diesel 6. Technic	Generator shall be of al specification 3.8	perable in Modes 5 and 3.1.2.
2.2.12	one nour or	Generator has been greater, the Diesel for water. Technica	operated for a period o Fuel Oil Day Tank shal I Specification
2.2.13	systems will To reset the pressed. The the Keep War	the engine keeps r l operate as if the ese systems the STAR his will stop the Ke rm Heaters, stop the	the Fail To Start alar unning, the support engine was shut down. T Pushbutton must be ep Warm Pumps, turn off Crankcase Fans and t are bypassed when shu
3.0	PREREQUISIT	ES OR INITIAL CONDIT	IONS
3.1	The NSCW Systo the Diese	stem is in service tel Generator Jacket	o provide cooling water Water Heat Exchangers.
3.2	The Diesel (Generator Building H ventilation during d	VAC System is available iesel operation.
3.3	least 24 hou only unless	Air Dryers have be ers. (Applies to Su alternate means of ering concurrence.)	en energized for at b-subsection 4.1.1 heating are available

ROCEDURE NO.		REVISION	PAGE NO				
VEGP	13145-1	20	6 of 43				
4.0	INSTRUCTIONS						
	NOTE						
		This procedure is writte Train A component design Train B designations are parenthesis.	ations				
4.1	STARTUP						
4.1.1	Preparing Train A (B) Diesel Generator For Automatic						
4.1.1.1	COMPLETE 11145-1, "Diesel Generator Alignment".						
4.1.1.2	PLACE the Jacket Water Circulating Pump and Standpipe Heater in service:						
	a. CHECK	that the LOW LEVEL JACK	ET WATER annunciator				
	b. CHECK (5742	the Jacket Water Standp	ipe Level 1-LI-5741				
		OV MCC 1NBI (1NBO), STAR lating Pump 1-2403-G4-00 ocal handswitch in AUTO,	1/11/19 1 19/11 1 -				
	2.7.7.7.7.7. No. 10.7.1.	0V MCC 1NBI (1NBO), ENERGY 1-2403-G4-001(002)-H01 witch in AUTO.	GIZE Jacket Water by placing the loca				

Oil should be added via the Lube Oil Sump Dipstick connection to bring the level into specification.

4.1.1.3 CHECK Lube Oil Sump Dipstick level between HIGH STATIC and LOW STATIC.

If the Lube Oil Circulating Pump (Keep-Warm Pump) cannot be started, the Diesel Generator should be declared inoperable and maintenance initiated to repair the pump.

- 4.1.1.4 PLACE the Lube Oil Circulating Pump and Lube Oil Heater in service:
 - a. CHECK the Low Level Lube Oil Annunciator is reset,

NOTE

The Lube Oil Circulating Pump Discharge Relief Valve may lift until the lube oil temperature is above 125°F.

- b. At 480V MCC 1NBI (1NBO), START Lube Oil Circulating Pump 1-2403-G4-001(002)-P07 by placing the local handswitch in AUTO,
- c. At 480V MCC 1NBI (1NBO), ENERGIZE Lube Oil Heater 1-2403-G4-001(002)-H02 by placing the local handswitch in AUTO.

4.1.1.5 PLACE the Starting Air System in service:

CAUTION

120V AC power must be available to the Air Dryers at least 24 hours prior to starting the refrigeration units unless alternate means of heating are available with Engineering concurrence.

a. START Air Dryer 1-2403-G4-001(002)-K01 and K02 refrigeration units,

NOTE

The red High Air Temperature light will come on when the refrigeration unit is started and will remain on for approximately 15 minutes. The Air Compressor should not be started until the red light on the Air Dryer goes off.

- b. At MCC 1NBI (1NBO), PLACE Air After Cooler Fans 1-2403-G4-001(002)-E01 and E02 in AUTO by placing the local handswitches in AUTO,
- c. At MCC 1NBI (1NBO), START Air Compressors 1-2403-G4-001(002)-C01 and C02 by placing the local handswitches in AUTO.
- 4.1.1.6 When Starting Air Receiver pressure reaches 25 psig, CRACK OPEN Receiver Drain Valves 1-2403-X4-762 (723) and 772 (728) to remove accumulated water and sediment, then CLOSE; independent verification closed required.
- 4.1.1.7 When Starting Air Receiver pressure reaches 245 to 255 psig. CHECK that the Air Compressors automatically shut down.
- 4.1.1.8 INITIATE 13146-1, "Diesel Generator Fuel Oil Transfer System" to establish a fuel oil supply to the engine.
- 4.1.1.9 COMPLETE Checklist 1 (2), Train A (B) Diesel Generator Standby Mode Status Check.
- 4.1.1.10 The Train A (B) Diesel Generator is now available for automatic starting.

PROCEDURE NO.		REVISION		PAGE NO.	Marie de la company de la comp	-
VEGP	13145-1		20 ^	PAGE NO.	9 of 43	
Secretaria de la constitución de						

4.1.2 Local Startup Of Train A (B) Diesel Generator

CAUTION

Prior to removing a Diesel Generator from standby, in modes 1, 2, 3 or 4, ensure that all of the safety related equipment for the other train is in service.

- REQUEST permission to take the Train A (B) Diesel 4.1.2.1 Generator out of standby.
- 4.1.2.2 If the engine cylinders have not been checked for moisture within the last 4 hours, PERFORM Sub-subsection 4.4.1, Cylinder Moisture Check, Cylinder moisture checks are not required if Da is started within 4 hours At Generator Control Panel PDG1 (PDG3): of a shutdown. MAI 3/24/90
- PLACE Local Remote Switch 1-HS-4516 (4517) in

LOCAL.

- If the generator is not to be paralleled to the off-site grid, PLACE Diesel Generator Output Breaker Control Switch 1-HS-1AA0219 (1BA0319) on OEAB in the PULL-TO-LOCK position.
- 4.1.2.4 At Engine Control Panel PDG2 (PDG4), VERIFY the ENGINE CONTROL IN LOCAL annunciator alarm energizes.

CAUTION

The Turbo Lube Oil Orifice Bypass Valve should be opened 1-2 minutes prior to diesel start, and should be promptly closed after the start. Excess prelubrication may result in oil accumulation in the exhaust piping and an exhaust fire upon engine start.

- OPEN the Turbo Lube Oil Orifice Bypass Valve 4.1.2.5 1-2403-U4-130 (131) one to two minutes prior to starting the Diesel Generator.
- 4.1.2.6 ALERT personnel in the vicinity of the Train A (B) Diesel Generator Building that engine startup is commencing.

4.1.2.3

CAUTIONS

- a. Turbocharger Oil Pressure
 Gauges 1-PI-19170 (19171) and
 1-PI-19170A (19171A) should be
 monitored during startup, and
 the STOP pushbutton depressed
 if oil pressure is not
 indicated within 15 seconds.
- b. If the Generator Field fails to flash, immediately stop the diesel and notify Engineering for an evaluation of the problem.

NOTE

When the Diesel Generator is started, the Generator Trouble Alarm may annunciate due to a spurious actuation of the Generator Field Ground relay. This is a normal startup alarm.

- 4.1.2.7 DEPRESS Manual Start pushbutton 1-HS-4569A (4570A).
- 4.1.2.8 CLOSE the Turbo Lube Oil Orifice Bypass Valve 1-2403-U4-130 (131); independent verification required.
- 4.1.2.9 If the Generator Field Ground relay flag is visible, then PERFORM the following at Generator Control Panel PDG1 (PDG3):
 - a. RESET the DGlA (DGlB) Generator Field Ground relay flag by placing the Generator Field Ground relay test switch to the RESET position,
 - b. DEPRESS the Relay Target Reset Pushbutton.
- 4.1.2.10 At 480V MCC 1NBI (1NBO), CHECK the following:
 - a. The Generator Space Heater is OFF,
 - b. The Jacket Water Circulating Pump is OFF,
 - c. The Lube Oil Circulating Pump is OFF.

PROCEDURE NO.		REVISION		
VEGP	13145-1	20	PAGE NO.	11 06 /3
-				11 of 43

- 4.1.2.11 While the Diesel Generator is operating, CHECK for rubbing or excessive vibrations of small diameter tubing supporting Diesel Generator operation, e.g., fuel lines, instrumentation or instrument air tubing.
- 4.1.2.12 If the Diesel Engine is operated for more than 10 minutes, INITIATE 11885-C, "Diesel Generator Operating Log".
- 4.1.3 Startup Of Train A (B) Diesel Generator From The Control Room

Complete instructions for paralleling a Diesel Generator to its respective Class 1E bus are contained in 13427-1, "4160V AC 1E Electrical Distribution". The following steps are provided for engine startup.

- 4.1.3.1 DISPATCH an operator to the Train A (B) Diesel Generator Building.
- 4.1.3.2 If the engine cylinders have not been checked for moisture within the last 4 hours, COMPLETE Sub-subsection 4.4.1. Cylinder Moisture Check.

 MW 3/24/90 Cylinder moisture checks are not required if the Da is started within 21 hours of a skutde AUTION

The Turbo Lube il Orifice
Bypass Valve should be opened
1-2 minutes prior to diesel
start, and should be promptly
closed after the start.
Excess prelubrication may
result in oil accumulation
in the exhaust piping and an
exhaust fire upon engine start.

- 4.1.3.3 OPEN the Turbo Lube Oil Orifice Bypass Valve, 1-2403-U4-130 (131) one to two minutes prior to starting the Diesel Generator.
- 4.1.3.4 ALERT personnel in the vicinity of the Train A (B)
 Diesel Generator Building that engine startup is
 commencing.

CAUTIONS

- a. Turbocharger Oil Pressure
 Gauges 1-PI-19170 (19171) and
 1-PI-19170A (19171A) should be
 monitored during startup, and
 the STOP pushbutton depressed
 if oil pressure is not
 indicated within 15 seconds.
- b. If the Generator Field fails to flash, immediately stop the Diesel and notify Engineering for an evaluation of the problem.

NOTE

When the Diesel Generator is started, the Generator Trouble Alarm may annunciate due to a spurious actuation of the Generator Field Ground relay. This is a normal startup alarm.

- 4.1.3.5 At the Electrical Auxiliary Board, DEPRESS Start pushbutton 1-HS-4569B (4570B).
- 4.1.3.6 CLOSE the Turbo Lube Oil Orifice Bypass Valve 1-2403-U4-130 (131); independent verification required.
- 4.1.3.7 If the Generator Field Ground relay flag is visible, then PERFORM the following at Generator Control Panel PDG1 (PDG3):
 - a. RESET the DGIA (DGIB) Generator Field Ground relay flag by placing the Generator Field Ground relay test switch to the RESET position,
 - b. DEPRESS the Relay Target Pushbutton.
- 4.1.3.8 At 480V AC MCC 1NBI (1NBO), CHECK the following:
 - a. The Generator Space Heater is OFF,
 - b. The Jacket Water Circulating Pump is OFF,
 - c. The Lube Oil Circulating Pump is OFF.
- 4.1.3.9 While the Diesel Generator is operating, CHECK for rubbing or excessive vibrations for small diameter tubing supporting Diesel Generator operation, e.g., fuel lines, instrumentation or instrument air tubing.
- 4.1.3.10 If the Diesel Engine is operated for more than 10 minutes, INITIATE 11885-C, "Diesel Generator Operating Log".

ROCEDURE NO.		REVISION	PAGE NO.
VEGP	13145-1	20	13 of 4:
4.1.3.11	If the Dies	sel Generator is to be s Class IE bus, PERFORM t	ynchronized to its he following:
	a. NOTIFY Genera	the System Operator thator is being synchroniz	at the Diesel
	b. GO to Distri	13427-1, "4160V AC 1E E bution System".	lectrical
4.2	SYSTEM OPER	MATION	
	NONE		
4.3	SHUTDOWN		
4.3.1	Stopping Tr	ain A (B) Diesel Genera	tor
		CAUTION	
	s e o D f	f a Safety Injection (Signal is received during ngine coastdown, monitor if pressure and trip the iesel Generator if pressalls below the trip set f 30 psi.	lube e sure
4.3.1.1	To stop Tra Electrical	in A (B) Diesel Generato Auxiliary Board:	or from the
	a. DEPRES	S Stop Pushbutton 1-HS-4	571B (4572B),
	b. OBSERV	E generator voltage drop	os to zero,
	c. PLACE to UNI	the Unit/Parallel Switch	1-HS-4414B (4452B
4.3.1.2	To stop Tra: Generator B	in A (B) Diesel Generatouilding:	or from the Diesel
	a. At the LOCAL/I	Generator Control Panel REMOTE Switch 1-HS-4516	, PLACE the (4517) to LOCAL,
	b. At the pushbut	Engine Control Panel, D tton 1-HS-4571A (4572A),	EPRESS Stop
	c. CHECK	red STOPPING lamp lit,	
	d PLACE to	the Unit/Parallel Switch	1-HS-4414A (4452A
	e. PLACE 1	L-HS-4516 (4517) in REMO	TE; independent

CEDURE NO.		REVISION	PAGE NO.
VEGP	13145-1	20	14 of 43
	The second secon	-	
4.3.1.3	VERIFY the	following:	
	a. The Ge	nerator Space Heater is	ON,
	b. The Ja	cket Water Keep-Warm Pum	p starts,
	c. The Lu	be Oil Keep-Warm Pump st	arts.
4.3.1.4		ximately 2 minutes, VERI BLE lamp is ON, and the	
4.3.1.5		proximately 2 minutes, t T off, RESET as follows:	he red STOPPING
		NOTE	
	f	landswitch is found on th ront of the engine auxil kid.	
	RUN/ST	the pushbutton 1-HS-4688 COP, in the PUSH-TO-STOP cimately 10 seconds,	
		the pushbutton 1-HS-4688 OP, in the PULL-TO-RUN p	
		the red STOPPING light VAILABLE light in ON.	is off and the blu
4.3.1.6	If the UNIT	AVAILABLE lamp does not	light, CHECK the
	a. Power	available status lights	ON,
	b. coners	ator Differential Protect	ion Relay 186A
	c. Emerge	ency stop signal reset,	
	d. Overs	peed trip reset,	
	e. Starti	ing air pressure is great	er than 210 psig,
	f. Contro	ol air pressure is greate	r than 45 psig.
4.3.1.7	CHECK that temperature	lube oil and jacket cool es stabilize between 142°	ing water and 170°F.
4.3.1.8	readiness,	sel Generator is to be re PERFORM Checklist 1 (2), de Status Check".	turned to standby "Diesel Generator

3.1.9 SHUT DOWN and ALIGN for STANDBY the Diesel Generator Building HVAC System per 13325-1 "Auxiliary Feedwater Pump House And Diesel Generator HVAC Systems".

NOTE

Accumulated water must be drained from the Fuel Oil Day Tank per Technical Specification 4.8.1.1.2.b.

- 4.3.1.10 If the Diesel Generator was operated for a period of one hour or more, SAMPLE the Diesel Generator Diesel Fuel Oil (DFO) Day Tank for water:
 - a. OBTAIN a clear container one liter size or larger,
 - b. DRAIN a small amount of fuel oil into the container from the DFO Day Tank Drain, 1-2403-U4-035 (036).
 - c. EXAMINE the sample or water on the bottom of the container,
 - d. If water is detected, REPEAT the sample until no water is found,
 - e. Independently verify locked closed 1-2403-U4-035 (036).
- 4.3.1.11 NOTIFY the Diesel Generator System Engineer of the Diesel Generator operation by dispatching the following:
 - a. A completed copy of Completion Sheet 1,
 - A copy of every completed 11885-C, "Diesel Generator Operating Log" if taken.

CEDURE NO.		REVISION	-	PAGE NO.	
VEGP	13145-1		20		16 of 43
4.4	NON-PERI	ODIC OPERATION			
4.4.1	Cylinder	Moisture Check			
		CAUTIO	ONS		
	â.	While perform moisture check Generator is a for standby se	k the Dies	sel	
	ъ.	If the Diesel out of service one hour, ensuitems of Technol. 8.1 are comp	for more are the actical Spec	than	
	c.	A cylinder most should not be in an action a Technical Spec 3.8.1.1 or 3.8	performed statement sification	i if of	
4.4.1.1	REQUEST p	permission to refrom standby.	move Trai	n A (B) Di	esel
4.4.1.2	At the Ge Switch 1-	enerator Control -HS-4516 (4517)	Panel, F in LOCAL.	PLACE Local	/Remote
4.4.1.3	At the Er Pushbutto	ngine Control Pa on 1-HS-4577 (45	nel, DEPR	UESS Mainte	nance Mode
4.4.1.4	VERIFY the extend.	at the Fuel and	Air Shut	down Cyline	ders fully
		CAUT	ION		
		If any water in the Intake Air notify the Uni Supervisor (US discontinue the until the probidentified and	Manifold t Shift (2) and is proced let has b	ure	
4.4.1.5	CHECK the	Intake Air Man ain Valves chec	ifold for king for	water by water then	opening eac closing:
	a. 1-24	03-X4-427 (428)	,		
	b. 1-24	03-X4-431 (432)			
		03-X4-425 (426)			
	d. 1-24	03-X4-429 (430)			
		The same of the same of			

Any moisture in the Barring Device Air Filter should be removed by blowing down the filter.

- 4.4.1.7 OPEN 1-2403-X4-761 (724) the Air Receiver 1 Supply To Engine Barring Device.
- 4.4.1.8 UNLOCK the Pneumatic Barring Device by removing the lockout pin.

CAUTION

Any evidence of water in the engine during the following steps should be brought to the attention of the USS and this procedure should be discontinued.

- 4.4.1.9 ENGAGE the barring device and bar the engine over for two revolutions while moritoring the cylinder cocks for evidence of moisture.
- 4.4.1.10 CHECK all cylinder cocks for evidence of moisture.
- 4.4.1.11 DISENGAGE and LOCKOUT the Pneumatic Barring Device.
- 4.4.1.12 VERIFY the BARRING DEVICE ENGAGED annunciator alarm resets.
- 4.4.1.13 CLOSE 1-2403-X4-761 (724) Air Receiver 1 Supply To Engine Barring Device.
- 4.4.1.14 OPEN the Turbo Lube Oil Orifice Bypass Valve 1-2403-U4-130 (131) for approximately 30 seconds then close.

NOTES

- a. Due to oiling of the cylinders, some oil is expected to be discharged from the cylinder head indicator cocks while rolling the engine.
- b. A small amount of moisture mist is expected to be discharged from the indicator cocks while rolling the engine.
- 4.4.1.15 DEPRESS the Engine Roll Pushbutton, and ROLL the engine on starting air for at least two revolutions.

PROCEDURE NO.		REVISION	PAGE NO.
VEGP	13145-1	20	18 of 43
4.4.1.16	CHECK all	cylinder cocks for eviden	ce of moisture.
4.4.1.17	CLOSE all	cylinder cocks.	
4.4.1.18	DEPRESS the	e OPERATIONAL mode pushbu (4576).	tton
4.4.1.19	OBSERVE the	e blue UNIT AVAILABLE ligh	ht is lit.
4.4.1.20	PLACE the I	LOCAL/REMOTE Switch 1-HS-	4516 (4517) in
4.4.1.21	COMPLETE CH Independent	necklist 3, "Cylinder Mois t Verification".	sture Check
4,4,2	Emergency S	Stopping Train A (B) Diese	el Generator.
		CAUTION	
	t á	An Emergency Stop signal varie the Diesel Generator all conditions and will present the engine untransplayers.	under
4.4.2.1	To initiate Auxiliary E	an Emergency Stop from to Board:	the Electrical
	a. DEPRES	SS both Emergency Stop Pus 567B (4568B) and 1-HS-456	hbuttons 7C (4568C),
	b. VERIFY	that generator voltage d	irops to zero.
4.4.2.2	To initiate Building:	an Emergency Stop from t	the Diesel Generato
	a. At the Stop P	Engine Control Panel, DE Sushbutton 1-HS-4567A (456	PRESS Emergency (8A),
	b. VERIFY	that red EMERGENCY STOP	lamp energizes.
		NOTE	
		n Emergency Stop signal conly be reset from the Englontrol Panel.	an
4.4.2.3	After the e Reset Pushb Panel.	ngine has stopped, DEPRES outton 1-HS-4581 (4582) at	S Emergency Stop the Engine Contro
4.4.2.4	VERIFY that	the red EMERGENCY STOP 1	amp goes out.

9

703445

PROCEDURE NO.		REVISION	PAGE NO.
VEGP	13145-1	20	20 of 43
4.4.3.3	double thi	iesel Generator is to be ckness of new glass in and DEPRESS the Reset (4584).	the Emergency Crave
4.4.3.4	VERIFY the	Shutdown Systems Activ	e 'ight energizes.
4.4.3.5		the Diesel Generator pe	
4.4.4	Adding Lub	e Oil To The Diesel Gen	erator Sump
		NOTES	
		The Lube Oil Sump level go up approximately 1 is every 55 gallons of oil	nch for
	第4条	Lube oil can be added to Diesel Sump Fill Connect while the diesel is oper or shut down,	tion
		When adding oil to the special care should be uprovent dirt and other contaminates from enters lube oil sump.	used to
4.4.4.1	ENSURE that before add	t the proper type of oil	l has been provided ator.
4.4.4.2	MEASURE the	e sump level using the d	dipstick.
4.4.4.3	Using an ethe sump the sump.	lectric or hand-driven parough the dipstick conf	oump, ADD the oil to nection on the top of
4.4.4.4	MEASURE the	sump level using the d	dipstick.
4.4.4.5	VERIFY the	sump level increases by	the expected amount.
4.4.5	Switching ! Filter With	From In-Service Lube Oil n Diesel Generator In Op	Filter To Standby peration
4.4.5.1	Slowly OPEN 1-2403-U4-8	V Lube Oi! Duplex Filter 328 (831)	Equalizing Valve
4.4.5.2	the standby	the filter mounted pres filter increase until stem pressure.	sure indicators on they read equal to

13145-1

20

21 of 43

NOTE

The LOW TEMP LUBE OIL IN annunciator may actuate due to cold lube oil from the standby filter. Disregard the alarm.

- When the pressure indication on the standby filter has 4.4.5.3 stabilized, slowly REPOSITION DIESEL GEN A (B) DUPLEX LUBE OIL FLTR INL and OUT Valves 1-2403-U4-826 (829) and 1-2403-U4-827 (830) until valves indicate mid position.
- ALLOW lube oil flow through both filters to continue 4.4.5.4 for 3 to 5 minute to ensure all air has been purged from the standby filter.

NOTE

If after switching to the Standby Lube Oil Filter. differential pressure remains high REPOSITION valves 1-2403-U4-826 (829) and 1-2403-U4-827 (830) to the mid position to allow flow through both filters.

- CLOSE valve 1-2405-U4-828 (831); independent 4.4.5.5 verification required.
- CONTINUE to reposition valves 1-2403-U4-o.6 (829) and 4.4.5.6 1-2403-U4-827 (830) until the standby filter is fully in service. Pressure indication on the filter taken out of service should decrease to zero.
- 4.4.5.7 INITIATE a Work Request Tag (WRT) to replace the filter taken out of service.
- 4.4.6 Switching From In-Service Fuel Oil Filter To Standby Filter With Diesel Generator In Operation

NOTE

The top part of the selection handle points to the Fuel Oil Filter that is in service.

4.4.6.1 Slowly REPOSITION selection handle on filter to the mid position.

high, REPOSITE mid position to allo Slowly POSITION selection handle until the standby INITIATE an WRT to replace the filter which was removed Filter is fully in service. Switching From In-Service Fuel Oil Strainer To Standby Switching From In-Service Fuel Oil Strainer To Standby Fuel Oil Strainer With Diesel Generator In Operation 4.4.6.2 from service. 4.4.6.3 The rop of the selector 4.4.7 handle points to the Fuel Oil Strainer that is in Slowly REPOSITION selector handle on strainer to the mid position. If after switching to the Standby Fuel Oil Strainer, differential pressure remains high, reposition handle to the mid position to allow flow through both Slowly POSITION selection handle until the standby INITIATE an WRT to replace the strainer which was INITIATE an WRT to replace the strainer which was removed from service, is high. 4.4.7.2 4.4.7.3

If after awitching to the Standby Fuel Oil Filter, differential pressure remains high, REPOSITION handle to the mid position to allow flow through both filters.

- 4.4.6.2 Slowly POSITION selection handle until the standby filter is fully in service.
- 4.4.6.3 INITIATE an WRT to replace the filter which was removed from service.
- 4.4.7 Switching From In-Service Fuel Oil Strainer To Standby Fuel Oil Strainer With Diesel Generator In Operation

NOTE

The top of the selector handle points to the Fuel Oil Strainer that is in service.

4.4.7.1 Slowly REPOSITION selector handle on strainer to the mid position.

NOTE

If after switching to the Landby Fuel Oil Strainer, differential pressure remains high, reposition handle to the mid position to allow flow through both strainers.

- 4.4.7.2 Slowly POSITION selection handle until the standby strainer is fully in service.
- 4.4.7.3 INITIATE an WRT to replace the strainer which was removed from service, if cleaning is required or differential pressure is high.

PROCEDURE NO.		Terror	THE RESIDENCE OF THE PARTY OF T				
VEGP	13145-1	REVISION	20	PAGE NO.	23 of	43	
	PACIFICAL STREET, STRE	THE RESERVE THE PARTY OF THE PA	-				

4.4.8 Generator Failure During Loss Of Offsite Power

CAUTION

This section provides instructions for restoring the generator if the engine starts but the generator fails to develop adequate output voltage during startup due to a voltage regulator malfunction. These instructions should only be used to try to restore the generator during a loss of offsite power incident and are not to be used during routine testing or operation.

- 4.4.8.1 CHECK for any tripped relays at the Diesel Generator Control Panel PDG1 (PDG3).
- 4.4.8.2 If any relays are tripped, INITIATE maintenance to correct the problem.
- 4.8.3 If no relays are tripped DEPRESS the Field Flash Pushbutton 1-HS-4459 (4460) for 3-5 seconds.
- 4.4.8.4 CHECK that Generator volts raises to 4025-4330 volts.
- 4.4.8.5 If generator voltage goes up but does not stabilize between 4025 and 4330 volts, TRANSFER to the Manual Voltage Regulator per Step 4.4.8.10.
- 4.4.8.6 If generator voltage does not go up to normal TRANSFER the generator to the redundant bridge.

NOTE

The diesel engine may be allowed to continue running while transferring the Bridge Transfer Switch.

- a. FNSURE the Diesel Generator Output Breaker 1AA0219 (1BA0319) is open,
- b. DEPRESS the Emergency Shutdown Puchbutton 1-HS-4474 (4475) on PDG1 (PDG3),
- c. VERIFY the generator field volts are zero,

The Bridge Transfer Switch is located in the upper part of the left bay of PDG1 (PDG3).

- d. TRANSFER the Bridge Transfer Switch (S1) to the other bridge (1 or 2),
- e. DEPRESS the Exciter Enable Pushbutton 1-HS-4457 (4458).
- 4.4.8.7 DEPRESS the Field Flash Pushbutton 1-HS-4459 (4460) for 3-5 seconds.
- 4.4.8.8 CHECK that generator volts raise to 4025-4330 volts.
- 4.4.8.9 If generator voltage does not go up.
 - a. SHUT DOWN the Diesel Generator,
 - b. INITIATE maintenance to repair the problem.

CAUTION

The Manual Voltage Regulator should not be used when the Diesel Generator is paralleled to the offsite grid.

4.4.8.10 If generator voltage goes up but does not stabilize between 4025 and 4330 volts, TRANSFER to the Manual Voltage Regulator.

NOTE

The Manual Voltage Regulator can only be controlled from the local panel.

- a. DEPRESS the Emergency Shutdown Pushbutton 1-HS-4474 (4475) on PDG1 (PDG3).
- b. VERIFY the generator field volts are zero,
- PLACE Local/Remote Switch 1-HS-4516 (4517) in LOCAL,
- d. DEPRESS the Manual Voltage Regulator Pushbutton 1-HS-4495 (4496),
- e. VERIFY the Manual Voltage Regulator light is on,
- f. DEPRESS the Exciter Enable Pushbutton 1-HS-4457 (4458).

PROCEDURE NO.	RI	EVISION	PAGE NO.
VEGF	13145-1	20	25 of 43
4.4.8.11	DEPRESS the F 3-5 seconds.	ield Flash Pushbutton 1	-HS-4459 (4460) for
4.4.8.12	ADJUST the ge	nerator volts to 4025-43	330 volts.
4.4.8.13	PLACE the Loc REMOTE.	al/Remote Switch 1-HS-4	516 (4517) in
4.4.8.14	If the genera	tor volts do not go to r	normal:
	a. SHUT DOWN	N the Diesel Generator,	
	b. INITIATE Generator	maintenance to repair t	the Diesel
5.0	REFERENCES		
5.1	P&ID's		
5.1.1	1X4DB170-1,	Diesel Generator Syste	m Train A
5.1.2		Diesel Generator Syste	
5.2	ONE-LINE DIAGE		
5.2.1	1X3D-AA-K01,	Diesel-Generators 1A & Meters	lB Relays &
5.3	ELEMENTARY DRA	AWINGS	
5.3.1	1X3D-BA-D02D,	4160V Incm. Brkr 152-1 Emergency Diesel Gen.	AA0219 From
5.3.2	1X3D-BA-D03D,	4160V Incm. Brkr 152-1 Emergency Diesel Gen.	BA0319 From 1B
5.3.3	1X3D-BA-M10B,	Class 1E Train A Manua	1 Synchronization
5.3.4	1X3D-BA-M10C,	Class lE Train B Manua	l Synchronization
5.3.5	1X3D-BH-G03A,	Diesel Generator lA Ca Diagram	bling Block
5.3.6	1X3D-BH-G03B,	Diesel Generator 1B Ca Diagram	bling Block
5.3.7	1X3D-BH-G03C,	Diesel Generator lA En	gine Controls
5.3.8	1X3D-BH-G03D,	Diesel Generator 1A En	gine Controls
5.3.9	1X3D-BH-G03E,	Diesel Generator lA En	gine Controls

VEGP	1.3145-1	20 PAGE NO. 26 OF 43
5.3.10	1X3D-BH-G03F,	Diesel Generator 1A Alarms
5.3.11	1X3D-BH-G03G,	Diesel Generator 1A Relays and Governor
5.3.12	1X3D-BH-G03H,	Diesel Generator 1A Voltage Regulator
5.3.13	1X3D-BH-G03J,	Diesel Generator 1A Generator Controls
5.3.14	1X3D-BH-G03M,	Diesel Generator 1B Engine Controls
5.3.15	1X3D-BH-G03N,	Diesel Generator 1B Engine Controls
5.3.16	1X3D-BH-G03P,	Diesel Generator 1B Engine Controls
5.3.17	1X3D-BH-G03Q,	Diesel Generator 1B Alarms
5.3.18	1X3D-BH-G03R,	Diesel Generator 13 Relays and Governo
5.3.19	1X3D-BH-G03S,	Diesel Generator 1B Voltage Regulator
5.3.20	1X3D-BH-G03T,	Diesel Generator 1B Generator Controls
5.4	CONTROL LOGIC	DIAGRAMS
5.4.1	1X5DN107-2,	Diesel Generator Engine
5.4.2	1X5DN107-	Diesel Generator Excitation
5.4.3	1X5DN107-4,	Diesel Generator Engine Auxiliaries
5.4.4	1X5DN107-5,	Diesel Generator Engine Auxiliaries
5.5	VENDOR DRAWIN	GS
5.5.1	1X4AK01-25,	Exhaust, Intake & Crankcase Piping Schematic
5.5.2	1X4AK01-26,	Jacket Water Piping Schematic
5.5.3	1X4AK01-27,	Lube Oil Piping Schematic
5.5.4	1X4AK01-28,	Fuel Oil Piping Schematic
5.5.5	1X4AK01-29,	Starting Air Piping Schematic
5.5.6	1X4AK01-31,	Engine Control Logic Diagram
5.5.7	1X4AK01-42,	Engine Control Panel Installation
5.5.8	1X4AK01-44,	Engine Control Panel Schematic
5.5.9	1X4AK01-45,	Engine Control Panel Schematic

ROCEDURE NO.		VISION PAGE NO.
VEGP	131.45-1	20 27 of 43
5.5.10	1X4AK01-46,	Engine Control Panel Schematic
5.5.11	1X4AK01-48,	Engine Control Panel Schematic
5.5.12	1X4AK01-49,	Engine Control Panel Schematic
5.5.13	1X4AK01-50,	Engine Control Panel Schematic
5.5.14	1X4AK01-52,	Engine Control Panel Schematic
5.5.15	1X4AK01-291,	Standby Diesel-Gen MCC 1NBI, 1NBO Front View
5.5.16	1X4AK01-292,	Standby Diesel-Gen Interconnection Diag For M.C.C.
5.5.17	1X4AK01-293,	Standby Diesel-Gen Interconnection Diag For M.C.C.
5.5.18	1X4AK01-294,	Standby Diesel-Gen Elem. Diag. M.C.C.
5.5.19	1X4AK01-295,	Standby Diesel-Gen Elem. Diag. M.C.C.
5.5.20	1X4AK01-296,	Standby Diesel-Gen Elem. Diag. M.C.C.
5.5.21	1X4AK01-297,	Diesel-Gen. Local Control Panel Outline
5.5.22	1X4AK01-302,	Gen. Control Panel Outline
5.5.23	1X4AK01-313,	Standby Diesel Gen. Generator Control Panel Components Bill Of Materials
5.5.24	1X4AK01-315,	Diesel Gen. Neutral Grounding Cabinet Component List
5.5.25	1X4AK01-317,	Engine & Skid Electrical Schem. & Wirin
5.5.26	1X4AK01-318,	Engine & Skid Electrical & Wiring
5.5.27	1X4AK01-355,	Off-Engine Alarms
5.5.28	1X4AK01-356,	Gen. Control Panel A.C. Schematic
5.5.29	1X4AK01-357,	Gen. Control Panel A.C. Schematic
5.5.30	1X4AK01-358,	Gen. Control Panel A.C. Schematic
5.5.31	1X4AK01-397,	Standby Diesel Gen. Manual Voltage Reg.
5.5.32	1X4AK01-438,	
5.5.33	1X4AK01-439,	Generator Control Schematic

ROCEDURE NO.	RE	VISION PAGE NO.
VEGP	13145-1	20 28 of 43
	9	4
5.5.34	1X4AK01-440,	Generator Control Schematic
5.5.35	1X4AK01-441,	Generator Control Schematic
5.5.36	1X4AK01-442,	Generator Control Schematic
5.5.37	1X4AK01-443,	Engine Pneumatic Schematic
5.5.38	1X4AK01-458,	Instrument Ident. Sched. For Engine Support Systems
5.5.39	1X4AK01-528,	Starting Air Comp. Control Schematic
5.6	VENDOR MANUAL	S
5.6.1	AX4AK01-509,	Standby Diesel Gen. Instruction Manual
5.6.2	AX4AK01-510,	Standby D'esel Gen. Diesel Engine Parts Manual
5.6.3	AX4AK01-563,	Standby Diesel Gen. Associated Publications Instruction Manual, Book 1
5.6.4	AX4AK01-564,	Standby Diesel Gen. Associated Publications Instruction Manual, Book 2
5.7	PROCEDURES	
5.7.1	11885-C,	"Diesel Generator Operating Log"
5.7.2	13150-1,	"Nuclear Service Cooling Water System"
5.7.3	13325-1,	"Auxiliary Feedwater Pump House And Diesel Generator Building HVAC Systems'
5.7.4	13427-1,	"4160V AC 1E Electrical Distribution System"

END OF PROCEDURE TEXT

VEGP

13145-1

traceta, in a

20

TABLE 1

D/G VALID TEST AND FAILURE EVALUATION CRITERIA

Valid tests and failures (per Regulatory Guide 1.108, Section C.2.e and Technical Specification 4.8.1.1.3) shall be based on the following criteria:

- 1. All s'art attempts (automatic, including those from bona fide signals, or manual) that result in a failure to start, except as noted in (2) below, should be considered valid tests and failures.
- 2. Unsuccessful start and load attempts that can definitely be attributed to operating error, to spurious operation of a trip that is bypassed in the emergency operating mode, to malfunction of equipment that is not operative in the emergency operating mode (e.g., synchronizing circuitry) or is not part of the defined Diesel Generator unit design should not be considered valid tests or failures.
- 3. Successful starts, including those initiated by bona fide signals, followed by successful loading (sequential or manual) to at least 50% of continuous rating and continued operation for at least one hour should be considered valid successful tests. (Failures occurring after one hour are not considered valid failures.)
- 4. Successful starts that are terminated intentionally without loading, as defined in (3) above, should not be considered valid tests or failures.
- Successful starts followed by an unsuccessful loading attempt should be considered valid tests and failures, except as noted in (2) above.
- 6. Tests that are terminated intentionally before completion as defined in (3) above because of an alarmed abnormal condition that would ultimately have resulted in Diesel Generator damage or failure should be considered valid tests and failures.
- 7. Tests performed in the process of troubleshooting should not be considered valid tests. Tests that are performed to verify correction of the problem should be considered valid tests and successes or failures, as appropriate.
- 8. Cranking and venting procedures that lead to the discovery of conditions (e.g., excessive water or oil in a cylinder) that would have resulted in the failure of the Diesel Generator unit during test or during response to a bona fide signal should be considered a valid test and failure.

				PAGE NO.	
VEGP	13145-1	20)	3	10 of 43
		COMPLETION SHE	ET 1	Sheet	1 of 1
TO:	DIESEL GEN	NERATOR SYSTEM ENG	SINEER		
FROM:	UNIT SHIFT	SUPERVISOR (UNIT	(1)		
Diesel G	enerator Tes	sted: [] DG1	Α [] DG1B	
Start Da	te: / /		Shutdow	n Date:	1 1
Start Ti	me:			n Time:	
	gine Hours:			Hours:	
		irbocharger prelub			
	or start:			. , , , , , ,	7 4110
[] Main	tenance Trou	blshooting	[] Fun	ctional Te	sting
		[] Other:	, ,		0.55118
Reason f	or trip or f	ailure to start:		normalisma communication and amplian	
			rip signa	l[] Alarm	Respons
	al [] Equip	ailure to start:	rip signa	l[] Alarm	Respons
[] Manu	al [] Equip	ment failure[] T	rip signal		Respons
[] Manu [] Othe DR# (if) List any	al [] Equip r: known)	oment failure[] T	T # (If Kr	nown)	enerator
[] Manu [] Othe DR# (if List any failure	al [] Equip r:known) conditions to start:	went failure[] T	T # (If Kr	nown)	enerator
[] Manu [] Othe DR# (if List any failure Comments	al [] Equip r: known) conditions to start:	war that would have r	T # (If Kr	nown)	enerator
[] Manu [] Othe DR# (if List any failure Comments	al [] Equip r: known) conditions to start:	war that would have r	T # (If Kr	nown)	enerator
[] Manu [] Othe DR# (if List any failure Comments	al [] Equip r: known) conditions to start: d By:	war that would have r	T # (If Kr	nown)	enerator
[] Manu [] Othe DR# (if List any failure Comments Complete Reviewed	al [] Equip r: known) conditions to start: d By: By: Unit Sh	war that would have r	T # (If Kr	nown)	enerator
[] Manu [] Othe DR# (if) List any failure Comments Complete Reviewed	al [] Equip r: known) conditions to start: d By: By: Unit Sh	went failure[] T WR that would have r Ift Supervisor rt Evaluation:	T # (If Kr	nown)	enerator Time
[] Manu [] Othe DR# (if List any failure Comments Complete Reviewed Diesel Ge [] Success	al [] Equip r: known) conditions to start: d By: Unit Shenerator Sta	went failure[] T WR that would have r Ift Supervisor rt Evaluation:	T # (If Kresulted in	Date	enerator Time Time
[] Manu [] Othe DR# (if List any failure Comments Complete Reviewed Diesel Ge [] Succe [] Valid	al [] Equip r: known) conditions to start: d By: Unit Shenerator Sta	war that would have related that would have related to the supervisor reconstruction:	T # (If Kresulted in	Date Valid Te Non-Vali	Time Time st
[] Manu [] Othe DR# (if) List any failure Comments Complete Reviewed Diesel Ge [] Succe [] Valid	al [] Equip r: known) conditions to start: d By: By: Unit Sh enerator Sta essful Start d Failure Valid Failure	war that would have related that would have related to the supervisor reconstruction:	T # (If Kresulted in	Date Date Valid Te	Time Time

Procedure	No.		Revision		Page No.	
	VEGP	13145-1		20		31 of 43
						Sheet 1 of 6
			CHECKL	IST 1		
		TRAIN A DIE	SEL GENERATOR ST	TANDBY MODE STATUS	CHECK	
ENGI	NE CONTRO	L PANEL - PDG2		STATUS		INITIALS
1.	All annu	nciator windows		No unexpected alarms		
2.	Starting	Air Pressure:				
	a. Lef	t Bank 1-PI-9056		220-255 psig		
	b. Rig	ht Bank 1-PI-9052		220-255 psig		
3.	Control	Air Pressure 1-PI-1	19174	58-62 psig		
4.	UNIT AVA	ILABLE Light		ON		
5.	Thermoco	uple Selector:				
	a. Lub	ricating Oil In		142-170°F		
	b. Lub	ricating Oil Out		142-170°F		
	c. Jac	ket Water In		142-170°F		
	d. Jac	ket Water Out		142-170°F		

roceduri	e No.	Revision		Page No.		
	VEGP 13145-1		20		32	of 43
					Sheet 2	of 6
		CHECKL	IST 1			
	TRAIN A	DIESEL GENERATOR S	TANDBY MODE STATE	JS CHECK		
ENG	INE CONTROL PANEL - PDG2		STATUS		INITIALS	IA
6.	POWER AVAILABLE Lights:					
	a. A		ON			
	b. B		ON			
	c. C		ON			
7.	STOPPING LIGHT		OFF -			
CENE	ERATOR CONTROL PANEL - PD	G1	STATUS			
1.	Unit/Parallel Switch 1-		Center After Unit			
2.	Local/Remote Switch 1-H	S-4516	REMOTE			1
3.	Lockout Relays:					
	a. 186A		RESET			
	ь. 186В		RESET			
	c. 186C		RESET			
4.	Voltage Regulator					
	a. Automatic Voltage	Regulator Light	ON			
	b. Manual Voltage Reg	ulator Light	OFF			

Procedure		Revision		Page No.	
	VEGP 13145-1		20		33 of 43
					Sheet 3 of 6
		CHE	ECKLIST 1		
	TRAIN A DIE	SEL GENERATO	OR STANDBY MODE STA	ATUS CHECK	
MOTO	OR CONTROL CENTER 1NBI		STATUS		INITIALS
1.	Air After Cooler Fan No. 1		AUTO		
2.	Air Compressor No. 1		AUTO		
3.	Air After Cooler Fan No. 2		AUTO		
4.	Air Compressor No. 2		AUTO		
5.	Jacket Water Circulating Po	шр	AUTO -		
6.	Jacket Water Heater		AUTO		
7.	Lube Oil Circulating Pump		AUTO		
8.	Lube Oil Heater		AUTO		
9.	Generator Space Heater		AUTO		

rocedure No.	Revision		Dana No.		
VEGP 13145-1		20	Page No.	34	of 43
		CCKLIST 1		Sheet 4	of 6
DIESEL GENERATOR SKID -		OR STANDBY MODE STATUS	US CHECK	INITIALS	IV
1. Governor Settings				- American consistence of the constant of the	
Speed Droop		2.6			
Load Limit		MAX FUEL			
Speed		14.34			
Oil Level		Above center of sight glas			
 Overspeed Trip Air (Located under righ Turbocharger) 	Press t bank	58-62 psig			
3. Lube Oil Level - Di	pstick	MAX STATIC ±	L"		
4. Run/Stop Switch 1-H	S-4688	PULL-TO-RUN			
5. Generator Bearing O	il Level	Centerline of sight glass of above			
6. Turbocharger Bearin	gs				
a. Right Bank Sig	ht Glass	Flowing			
b. Left Bank Sigh	t Glass	Flowing			

Procedure No. Revision Page No. 35 of 43 20 13145-1 VEGP Sheet 5 of 6 CHECKLIST 1 TRAIN A DIESEL GENERATOR STANDBY MODE STATUS CHECK INITIALS IV STATUS UPSTAIRS 1. Intake Air Filter Unobstructed Screens Half Full b. Oil Level Sight Glass 2. Exhaust Silencer No Combustibles in Room ELECTRICAL CONTROL PANEL QEAB - MAIN CONTROL ROOM DSL GEN 1A UNIT/PARALLEL Switch NORMAL AFTER UNIT 1-HS-4414B SYNC MODE SELECTOR Switch 1-TS-DG1A AUTO 2. DG1A OUTPUT BRKR 1-HS-1AA0219 AUTO 3. DFO DAY TANK LEVEL 1-LI-9018 52-1007

ocedure No.		Revision		Page No.	
VEGP	13145-1		20		36 of 43
		СНЕ	ECKLIST 1		Sheet 6 of 6
4160V AC SV	GR 1AA02 - CONTRO	L BLDG LVL A	STATUS	INITIA	ALS IV
1. 1AA02-	-19 10A FUSE REMO	TE BK% CKT(AY)	INSTALLED		
2.	10A FUSE REMO	TE BKR CKT(AZ)	INSTALLED		
3.	15A BKR BREAK	ER CONTROL	CLOSED		*
4.	EMERGENCY DG1	A INC BRKR	RACKED IN		
5.		R POWER SWITCH ON PRINGS CHARGED	ON/CHARGED		
	GENERATOR BRKR C	ONT SELECT SWITCH	CONT RM		
Commer	its				
Comple	eted By:			Date	Time
Review	ved By:				
				Date	Time

Procedure No.	Revision		Page No.	
VEGP 13145-1		20		37 of 43
				Sheet 1 of 8
	CHECKLI	IST 2		
TRAIN	B DIESEL GENERATOR ST	TANDBY MODE STATUS	CHECK	
ENGINE CONTROL PANEL - PDG	34	STATUS		INITIALS
1. All annunciator windo	วพร	No unexpected alarms		
2. Starting Air Pressure				
a. Left Bank 1-PI-9	0057	220-255 psig		
b. Right Bank 1-PI-	9053	220-255 psig		
3. Control Air Pressure	1-PI-19175	58-62 psig		
4. UNIT AVAILABLE Light		ON		
5. Thermocouple Selector	*			
a. Lubricating Oil	In	142-170°F		
b. Lubricating Oil	Out	142-170°F		
c. Jacket Water In		142-170°F		
d. Jacket Water Out		142-170°F		

rocedu	ire No.	evision	Page No.		
	VEGP 13145-1	20		38	of 43
				Sheet 2	of 6
		CHECKLIST 2			
		L GENERATOR STANDBY MODE ST	ATUS CHECK		
ENG	INE CONTROL PANEL - PDG4	STATUS		INITIALS	IV
6.	POWER AVAILABLE Lights:				
	a. A	ON			
	b. B	ON			
	c. C	ON			
7.	STOPPING LIGHT	OFF			
GEN	ERATOR CONTROL PANEL - PDG3				
1.	Unit/Parallel Switch 1-HS-44	52A CENTER AFTI UNIT	ER		
2.	Local/Remote Switch 1-HS-451	7 REMOTE			
3.	Lockout Relays:				
	a. 186A	RESET			
	b. 186B	RESET			
	c. 186C	RESET			
4_	Voltage Regulator				
	a. Automatic Voltage Regula	ntor Light ON			
	b. Manual Voltage Regulator	Light OFF			

rocedur			Revision		Page No.	
	VEGP	13145-1		20		39 of 43
						Sheet 3 of 6
			СН	ECKLIST 2		
		TRAIN B	DIESEL GENERAT	OR STANDLY MODE ST	ATUS CHECK	
MOTO	OR CONTROL	CENTER 1NBO		STATUS		LJITIALS
1.	Air Afte	er Cooler Fan No	. 1	AUTO		
2.	Air Comp	ressor No. 1		AUTO		
3.	Air Afte	r Cooler Fan No.	. 2	AUTO		
4.	Air Comp	ressor No. 2		AUTO		
5.	Jacket W	later Circulating	g Pump	AUTO		
6.	Jacket W	ater Heater		AUTO		
7.	Lube 0il	Circulating Pum	пр	AUTO		
8.	Lube 0il	Heater		AUTO		
9.	Generato	r Space Heater		AUTO		

ocedure	No. VEGP 13145-1	Revision	20	Page No.	40	of 43
					Sheet 4	of 6
		CHE	CKLIST 2			
	TRAIN	B DIESEL GENERATO	R STANDBY MODE STA	TUS CHECK		
DIES	EL GENERATOR SKID - DO	GIB	STATUS		INITIALS	· IV
1.	Governor Settings					
	Speed Droop		2.6			
	Load Limit		MAX FUEL			
	Speed		12.2			
	Oil Level		Above center sight glass			
2.	Overspeed Trip Air Pr (Located under right Turbocharger)	ress bank	58-62 psig			
3.	Lube Oil Level - Dip	stick	Max Static	±1"		
4.	Run/Stop Switch 1-HS-	-4688	PULL-TO-RUN			
5.	Generator Bearing Oil	l Level	Centerline of sight glass	of		
6.	Turbocharger Bearings	3				
	a. Right Bank Sight	Glass	Flowing			
	b. Left Bank Sight	Glass	Flowing			

ocedu	e No.	Revision		Page No.	
	VEGP 13145-1		20		of 43
		CHECK	CLIST 2	Sheet 5	of 6
	TRAIN B	DIESEL GENERATOR	STANDBY MODE STATUS CH	HECK	
UPS	TAIRS		STATUS	INITIALS	IV
1.	Intake Air Filter				
	a. Screens		Unobstructed		
	b. Oil Level Sight Gl	lass	Half Full		
2.	Exhaust Silencer Room		No Combustibles in Room		
ELE	CTRICAL CONTROL PANEL QUA	AB - MAIN CONTROL	ROOM		
1.	DSL GEN 1B UNIT/PARALLE 1-HS-4452B	EL Switch	NORMAL AFTER UNIT	-	
2.	SYNC MODE SELECTOR Swit	ch 1-TS-DG1B	AUTO		2
3.	DG1B OUTPUT RKR 1-HS-18	BA0319	AUTO		
4.	DFO DAY TANK LEVEL 1-LI	-9019	52-1007		

Procedu	re No.		Revision			
	VEGP	13145-1		20		42 of 43
			СН	ECKLIST 2	Sheet	6 of 6
416	OV AC SWGR	16a03 - CONTRO	DL BLDG LVL A	STATUS	INITIALS	IA
1.	1BA03-19	10A FUSE REMO	DE BER CET(AY)	INSTALLED		
2.		10A FUSE REMO	OTE BKR CKT(AZ)	INSTALLED		
3.		15A BKR BREAK	CER CONTROL	CLOSED		
4.		EMERGENCY DG1	B INC BRKR	RACKED IN		
5.			R POWER SWITCH ON PRINGS CHARGED	ON/CHARGED		
6.		ENERATOR BRKR C -HS-1BA0319B	CONTROL SELECT	CONT RM		
	Comments					
	Completed	1 Зу:			Date	Time
	Reviewed	Ву:				
					Date	Time

PROCEDURE NO. REVISION PAGE NO. VEGP 13145-1 20 43 of 43 Sheet 1 of 1 CHECKLIST 3 CYLINDER MOISTURE CHECK INDEPENDENT VERIFICATION NOTES This checklist is written for Train A a. component designations. Train B designations are shown in parenthesis. b. When performing this checklist, circle the number of the component (Train A or B) that was actually checked. DIESEL GENERATOR: COMPONENT DESCRIPTION POSITION INITIALS 1-2403-X4-761 AIR RECEIVER #1 CLOSED (1-2403-X4-724)TO ENG BARR DEVICE 1-2403-U4-130 TURBO LUBE OIL CLOSED (1-2403-U4-131) ORIFICE BYPASS 1-HS-4516 LOCAL/REMOTE REMOTE (1-HS-4517)FUEL SHUTDOWN FULLY CYLINDER RETRACTED AIR SHUTDOWN FULLY CYLINDER RETRACTED 1-2403-X4-427 RIGHT BANK INTAKE CLOSED (1-2403-X4-428)MANIFOLD DRAIN 1-2403-X4-431 RIGHT BANK INTAKE CLOSED (1-2403-24-432)MANIFOLD DRAIN 1-2403-X4-425 LEFT BANK INTAKE CLOSED (1-2403-X4-426)MANIFOLD DRAIN 1-2403-X4-429 LEFT BANK INTAKE CLOSED (1-2403-X4-430) MANIFOLD DRAIN Performed By: DATE TIME Verified By: TIME DATE Reviewed By: USUS OF USS

DATE

TIME

Sate Sach

Vogtle Electric Generating Plant

NUCLEAR OPERATIONS

A

Procedure No. 13145-1

Revision No.

20

2

Page No.

Unit 1

Georgia Power

DIESEL GENERATORS

FOR INFORMATION ONLY

1.0 PURPOSE

This procedure plovides instructions for the operation of the Diesel Generators. This procedure should be used for maintenance troubleshooting or maintenance testing. Operability of the Diesel Generator is proven using 14980-1, "Diesel Generator Operability Test". Specific instructions are provided in the following subsections:

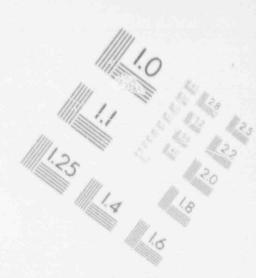
- 4.1.1 Preparing Train A(B) Diesel Generator For Automatic Operation

 4.1.2 Local Startup Of Train A(B) Diesel Generator

 4.1.3 Startup (E) Train A(B) Diesel Generator From
- The Control Room

 4.3.1 Stopping Train A(B) Diesel Generator
- 4.4.1 Cylinder Moisture Check
- 4.4.2 Emergency Stopping Train A(B) Diesel Generator
- 4.4 3 Diesel Generator Operation Under LOCA Conditions
- 4.4.4 Adding Lube Oil To The Diesel Generator Sump
- 4.4.5 Switching From In-Service Lube Oil Filter To Standby Filter With Diesel Generator In Operation.
- 4.4.6 Switching From In-Service Fuel Oil Filter To Standby Filter With Diesel Generator In Operation.
- 4.4.7 Switching From In-Service Fuel Oil Strainer
 To Standby Strainer With Diesel Generator In
 Operation
- 4.4.8 Generator Failure During Loss of Offsite Power

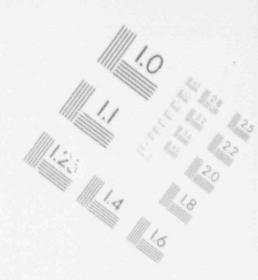
ROCEDURE NO.		REVISION		PAGE NO.	
VEGP	13145-1	2	0	2 of 43	
	ACT THE RESERVE THE STATE OF TH				
2.0	PRECAUTION	S AND LIMITATION	S		
2.1	PRECAUTION	S			
2.1.1	resistance	enerator must be to engine rotat the Pneumatic Ba	ion is en		
2.1.2	Relays are	bypassed during erator is not pa	a Normal	trical Protection Start when the to the off-site	
	a. Rever	se Power 132,			
	b. Under	frequency 181,			
	c. Negat	ive Phase Sequen	ce 146.		
2.1.3	When operating under actual Safety Injection Emergency Start conditions, the only active Diesel Generator protective devices are:				
	a. Gener	ator Differentia	1 187A, B	s, C,	
	b. Low L	ube Oil Pressure	,		
	c. High	Jacket Water Tem	perature,		
	d. Engin	e Overspeed.			
2,1.4	Heaters an		Space Hea	Warm Pumps and iter should be for is aligned for	
2.1.5	The govern	or Load Limit, S be altered unle	peed or S ss:	speed Droop settings	
	a. Requi	red by an approv	ed test p	procedure, or	
	b. The T	orque Seal has b	een damag	ged or broken.	
	00350-C, "	nance Department Maintenance Prog s to the governo	ram" to m	make any changes or	
2.1.6	additional	sel Generator is supplies of fue fifth day of co	1 oil sha	nuous operation, all be ordered on or operation.	

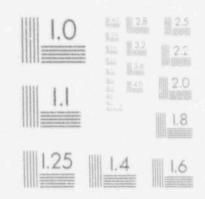


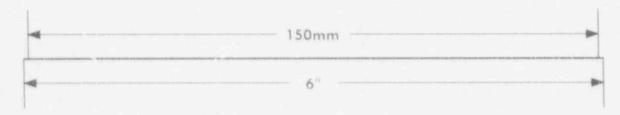




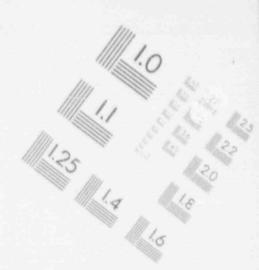
O'I STATE O'I

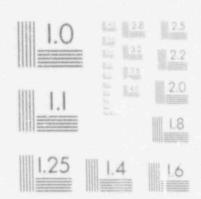


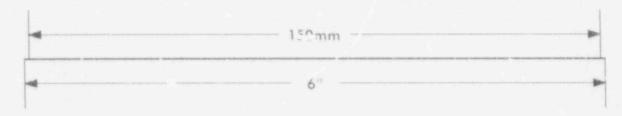




O'I STATE O'I

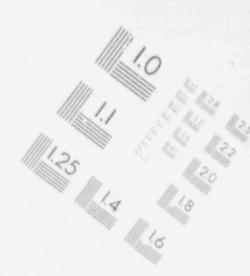


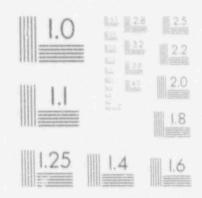




Scill Scill Scill

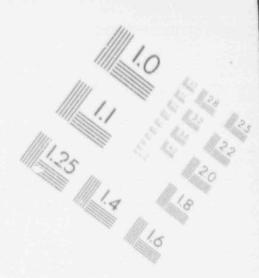
O'ILLE CY ILLE CY ILLE

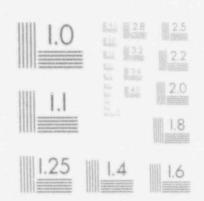


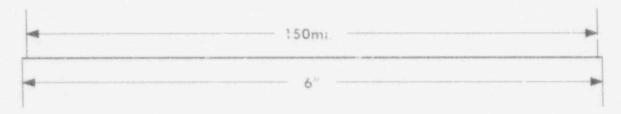




O'I STATE O'I

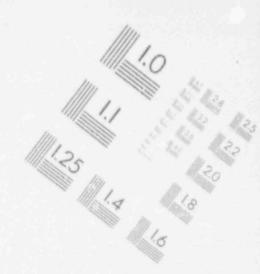




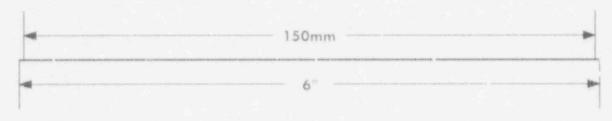


81 Bill Sc.

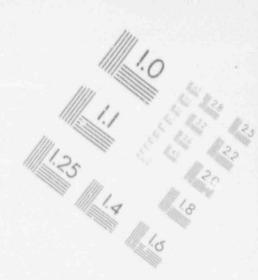
91 VIIII GZIIIII







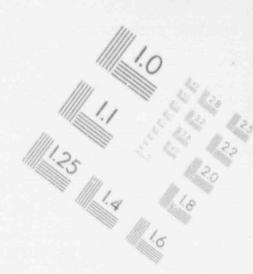
91 STATE OF THE ST



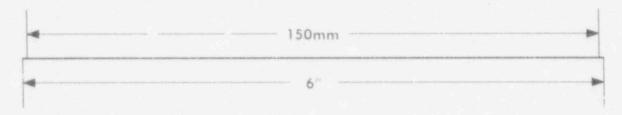




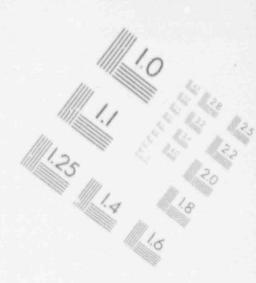
O'I SZIIII O'I

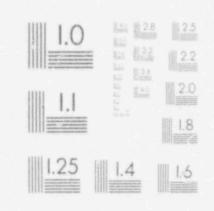


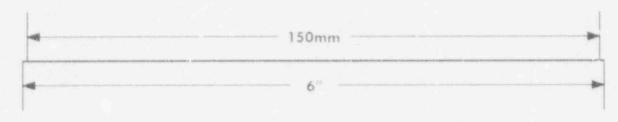




91 81 STILL GZILL



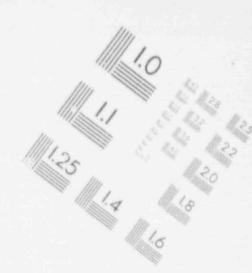


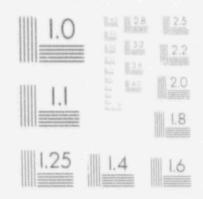


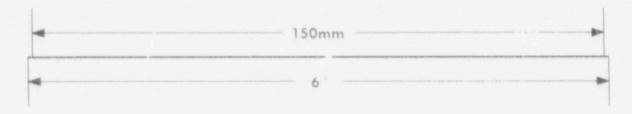
07 M

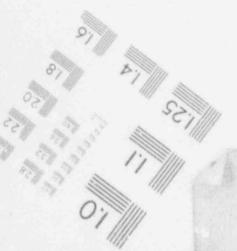
qi gilli gilli

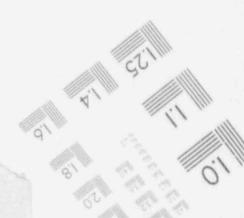
ot to st

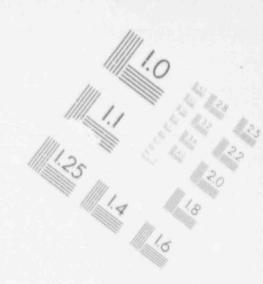


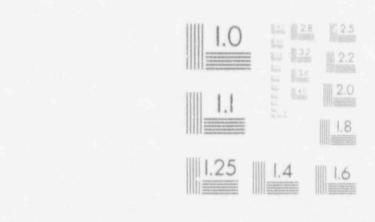


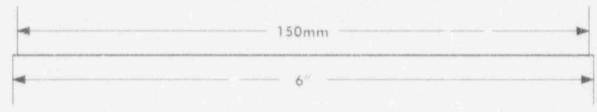












OI SIMILE STIME

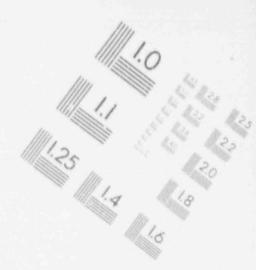




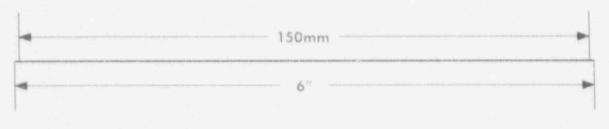


Or Main Scille

O'I STATE O'I

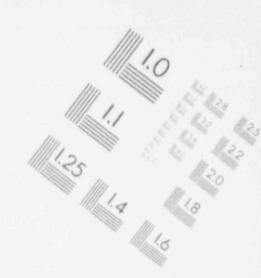




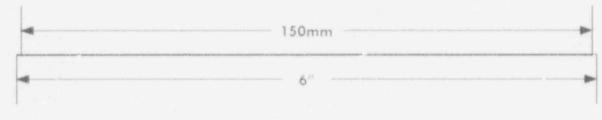


87 BY SEIM

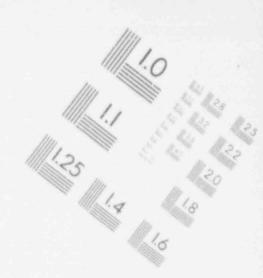
OIL STATE OF THE S



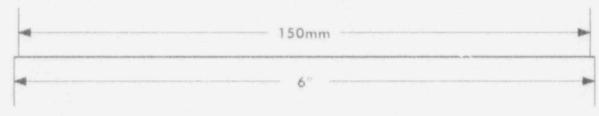




91 BIND STILL GTILL OIL







91 BI STILL GZIIII

R	OCEDURE NO.		REVISION	PAGE NO.
	VEGP	13145-1	20	3 of 43
	2.1.7	The emerge	ency Diesel Generators sha	all not be used for
	2.1.8	Parallel n 1-HS-4516	esel Generator is being of mode never transfer the LG (4517) on PDG1 (PDG3) to mor and voltage regulator	DCAL-REMOTE Switch LOCAL as this will
	2.1.9	power grid	Diesel Generator is paral: I the kVAR load should be one half of the kilowatt	maintained OUT and
	2.1.10	parallel w	Generators should not be with the offsite grid for s is to keep disturbances the Diesel Generators.	prolonged periods of
	2.1.11	Only one I except dur	Diesel Generator should be ing emergency conditions	e operated at a time
	2.2	LIMITATION	is	
	2,2.1	A Diesel G signal fro conditions	Generator will not accept om the Control Room if any exist:	an Emergency Start y of the following
			/Remote Switch 1-HS-4516) is in LOCAL,	(4517) at PDG1
		b. Start	ing air pressure in both 150 psig,	air headers is less
		c. Engir	e controls are in the mai	intenance mode,
		d. Emerg	ency Stop circuit energia	zed,
		e. Overs	peed trip not reset.	

NOTE

A Diesel Generator Emergency Start is initiated by closure of the Train A or B Engineered Safety Feature Safety Injection contacts or operation of the manual break-glass station at the Engine Control Panel All other Diesel Generator start signals are considered to be a Normal Start.

- 2.2.2 The following Diesel Engine shutdown signals are bypassed during an Emergency Start:
 - a. High crankcase pressure,
 - b. High engine/turbocharger vibration,
 - Low turbocharger oil pressure,
 - d. High engine bearing temperature,
 - e. High engine lube oil temperature,
 - f. Low jacket water pressure.
- 2.1.3 The rated capacity of a Diesel Generator is 7000 kW, load should not be permitted to exceed 7000 kW during testing unless specifically required by the test procedure. A 10% overload of 7700 kW is allowed for 2 hours during emergency operation.
- 2.2.4 The Diesel Generators should not be operated at less than 30% load (2100 kW) for prolonged periods of time.
- 2.2.5 If prolonged operation at less than 30% load cannot be avoided, the Diesel Generator should be loaded to 50% (3500 kW) for a 2 hour period for each 24 hour period of low or no-load operation.
- 2.2.6 The Diesel Generators can operate at full load for 3 minutes with no Nuclear Service Cooling Water (NSCW) flow. If NSCW flow is not established within 3 minutes to a running Diesel Generator, the Diesel Generator should be tripped.
- 2.2.7 The pneumatic engine barring device will only operate when the engine is in the MAINTENANCE mode and must be disengaged before the engine can return to the OPERATION mode.

ROCEDURE NO.		REVISION	IPAGE NO.
VEGP	13145-1	20	5 of 43
2,2,8	remain in e the Diesel Start signa signal or t the depleti stopping li	ted, the Diesel Generat ffect for 90 seconds. Generator will only res 1 generated by a Safety he local break glass st on of starting air, wai ght is OFF (approximate op before attempting to	During this period, pond to an Emergency Injection Actuation ation. To preclude t until local red ly 90 seconds) after
2.2.9	start signa Supervisor'	ttempts, including thos ls, shall be logged in s or Unit Control logbo de the following inform	the Unit Shift ok. The log entry
	a. Start	time,	
	b. Reason	for start,	
	c. Succes	s or failure of the sta	rt attempt.
2.2.10	Two separat	e and independent Diese Modes 1,2,3, and 4. T	l Generators shall be
2.2.11	One Diesel 6. Technic	Generator shall be operal specification 3.8.1.	able in Modes 5 and 2.
2.2.12	one hour or	Generator has been oper greater, the Diesel Fur for water. Technical	el Oil Day Tank shall
2.2.13	comes in bu systems wil To reset the pressed. The the Keep War	Diesel Engine start the the engine keeps runnil operate as if the enginese systems the START Police of the Keep this will stop the Keep to the Critical arms in service that at	ing, the support ine was shut down. ushbutton must be Warm Pumps, turn off ankcase Fans and
3.0	PREREQUISIT	ES OR INITIAL CONDITIONS	S
3.1		stem is in service to preel Generator Jacket Water	
3.2		Generator Building HVAC ventilation during diese	
3.3	least 24 hor	g Air Dryers have been ours. (Applies to Sub-sualternate means of heatering concurrence.)	ubsection 4.1.1

PROCEDURE NO.		REVISION	PAGE NO.
VEGP	13145-1	20	6 of 43

4.0 INSTRUCTIONS

NOTE

This procedure is written using Train A component designations. Train B designations are shown in parenthesis.

- 4.1 STARTUP
- 4.1.1 Preparing Train A (B) Diesel Generator For Automatic Operation
- 4.1.1.1 COMPLETE 11145-1, "Diesel Generator Alignment".
- 4.1.1.2 PLACE the Jacket Water Circulating Pump and Standpipe Heater in service:
 - a. CHECK that the LOW LEVEL JACKET WATER annunciator is not lit.
 - b. CHECK the Jacket Water Standpipe Level 1-LI-5741 (5742) is greater than 90%.
 - c. At 480V MCC 1NBI (1NBO), START Jacket Water Circulating Pump 1-2403-G4-001(002)-P04 by placing the local handswitch in AUTO,
 - d. At 480V MCC INBI (INBO), ENERGIZE Jacket Water Heater 1-2403-G4-001(002)-H01 by placing the local handswitch in AUTO.

NOTE

Oil should be added via the Lube Oil Sump Dipstick connection to bring the level into specification.

4.1.1.3 CHECK Lube Oil Sump Dipstick level between HIGH STATIC and LOW STATIC.

NOTE

If the Lube Oil Circulating
Pump (Keep-Warm Pump) cannot
be started, the Diesel Generator
should be declared inoperable
and maintenance initiated to
repair the pump.

- 4.1.1.4 PLACE the Lube Oil Circulating Pump and Lube Oil Heater in service:
 - a. CHECK the Low Level Lube Oil Annunciator is reset,

NOTE

The Lube Oil Circulating Pump Discharge Relief Valve may lift until the lube oil temperature is above 125°F.

- b. At 480V MCC 1NBI (1NBO), START Lube 0il Circulating Pump 1-2403-G4-001(002)-P07 by placing the local handswitch in AUTO,
- c. At 480V MCC 1NBI (1NBO), ENERGIZE Lube Oil Heater 1-2403-G4-001(002)-H02 by placing the local handswitch in AUTO.

4.1.1.5 PLACE the Starting Air System in service:

CAUTION

120V AC power must be available to the Air Dryers at least 24 hours prior to starting the refrigeration units unless alternate means of heating are available with Engineering concurrence.

a. START Air Dryer 1-2403-G4-001(002)-K0, and K02 refrigeration units,

NOTE

The red High Air Temperature light will come on when the refrigeration unit is started and will remain on for approximately 15 minutes. The Air Compressor should not be started until the red light on the Air Dryer goes off.

- b. At MCC 1NBI (1NBO), PLACE Air After Cooler Fans 1-2403-G4-001(002)-E01 and E02 in AUTO by placing the local handswitches in AUTO,
- c. At MCC 1NBI (1NBO), START Air Compressors 1-2403-G4-001(002)-C01 and C02 by placing the local handswitches in AUTO.
- 4.1.1.6 When Starting Air Receiver pressure reaches 25 psig, CRACK OPEN Receiver Drain Valves 1-2403-X4-762 (723) and 772 (728) to remove accumulated water and sediment, then CLOSE; independent verification closed required.
- 4.1.1.7 When Starting Air Receiver pressure reaches 245 to 255 psig, CHECK that the Air Compressors automatically shut down.
- 4.1.1.8 INITIATE 13146-1, "Diesel Generator Fuel Oil Transfer System" to establish a fuel oil supply to the engine.
- 4.1.1.9 COMPLETE Checklist 1 (2), Train A (B) Diesel Generator Standby Mode Status Check.
- 4.1.1.10 The Train A (B) Diesel Generator is now available for automatic starting.

ROCEDURE NO. REVISION PAGE NO.						
VEGP	13145-1	20	PAGE NO. 9 of 43			
			*			
4.1.2	Local Startup Of Train A (B) Diesel Generator					
	CAUTION					
	Ge mo th re	fior to removing a Diese merator from standby, it des 1, 2, 3 or 4, ensure at all of the safety lated equipment for the ther train is in service	in re			
4.1.2.1	REQUEST permission to take the Train A (B) Diesel Generator out of standby.					
4.1.2.2	If the engine cylinders have not been checked for moisture within the last 4 hours, PERFORM Sub-subsection 4.4.1, Cylinder Moisture Check.					
4.1.2.3	At Generator Control Panel PDG1 (PDG3):					
	a. PLACE I LOCAL,	ocal Remote Switch 1-HS	S-4516 (4517) in			
	Breaker	generator is not to be te grid, PLACE Diesel Ge Control Switch 1-HS-14 the PULL-TO-LOCK posit	enerator Output			
4.1.2.4	At Engine Control Panel PDG2 (PDG4), VERIFY the ENGINE CONTROL IN LOCAL annunciator alarm energizes.					
		CAUTION				
	By 1- st cl Ex re ir	ne Turbo Lube Oil Orifice pass Valve should be or 2 minutes prior to dies art, and should be proposed after the start. Access prelubrication may sult in oil accumulation the exhaust piping and chaust fire upon engine	pened sel mptly on d an			
4.1.2.5	OPEN the Turbo Lube Oil Orifice Bypass Valve 1-2403-U4-130 (131) one to two minutes prior to starting the Diesel Generator.					
4.1.2.6	ALERT person Diesel Gener commencing.	nnel in the vicinity of cator Building that eng	the Train A (B) ine startup is			

CAUTIONS

- a. Turbocharger Oil Pressure
 Gauges 1-PI-19170 (19171) and
 1-PI-19170A (19171A) should be
 monitored during startup, and
 the STOP pushbutton depressed
 if oil pressure is not
 indicated within 15 seconds.
- b. If the Generator Field fails to flash, immediately stop the diesel and notify Engineering for an evaluation of the problem.

NOTE

When the Diesel Generator is started, the Generator Trouble Alarm may annunciate due to a spurious actuation of the Generator Field Ground relay. This is a normal startup alarm.

- 4.1.2.7 DEPRESS Manual Start pushbutton 1-HS-4569A (4570A).
- 4.1.2.8 CLOSE the Turbo Lube Oil Orifice Bypass Valve 1-2403-U4-130 (131); independent verification required.
- 4.1.2.9 If the Generator Field Ground relay flag is visible, then PERFORM the following at Generator Control Panel PDG1 (PDG3):
 - a. RESET the DGIA (DGIB) Generator Field Ground relay flag by placing the Generator Field Ground relay test switch to the RESET position,
 - b. DEPRESS the Relay Target Reset Pushbutton.
- 4.1.2.10 At 480V MCC 1NBI (1NBO), CHECK the following:
 - a. The Generator Space Heater is OFF,
 - b. The Jacket Water Circulating Pump is OFF,
 - c. The Lube Oil Circulating Pump is OFF.

PROCEDURE NO.		REVISION		PAGE NO.	
VEGP	13145-1		20		11 of 43

- 4.1.2.11 While the Diesel Generator is operating, CHECK for rubbing or excessive vibrations of small diameter tubing supporting Diesel Generator operation, e.g., fuel lines, instrumentation or instrument air tubing.
- 4.1.2.12 If the Diesel Engine is operated for more than 10 minutes, INITIATE 11885-C, "Diesel Generator Operating Log".
- 4.1.3 Startup Of Train A (B) Diesel Generator From The Control Room

NOTE

Complete instructions for paralleling a Diesel Generator to its respective Class 1E bus are contained in 13427-1, "4160V AC 1E Electrical Distribution". The following steps are provided for engine startup.

- 4.1.3.1 DISPATCH an operator to the Train A (B) Diesel Generator Building.
- 4.1.3.2 If the engine cylinders have not been checked for moisture within the last 4 hours, COMPLETE Sub-subsection 4.4.1, Cylinder Moisture Check.

CAUTION

The Turbo Lube Oil Orifice
Bypass Valve should be opened
1-2 minutes prior to diesel
start, and should be promptly
closed after the start.
Excess prelubrication may
result in oil accumulation
in the exhaust piping and an
exhaust fire upon engine start.

- 4.1.3.3 OPEN the Turbo Lube Oil Orifice Bypass Valve, 1-2403-U4-130 (131) one to two minutes prior to starting the Diesel Generator.
- 4.1.3.4 ALERT personnel in the vicinity of the Train A (B)
 Diesel Generator Building that engine startup is
 commencing.

If the Diesel Engine is operated for more than 10

minutes, INITIATE 11885-C, "Diesel Generator Operating

Log".

OCEDURE NO.		REVISION	PAGE NO.
VEGP	13145-1	20	13 of 43
4.1.3.11	If the Dies associated	el Generator is to be Class lE bus, PERFORM	synchronized to its the following:
		the System Operator t tor is being synchroni	
		13427-1, "4160V AC 1E bution System".	Electrical
4.2	SYSTEM OPER	ATION	
	NONE		
4.3	SHUTDOWN		
4.3.1	Stopping Tr	ain A (B) Diesel Gener	ator
		CAUTION	
	e o D f	f a Safety Injection (ignal is received duringine coastdown, monitial pressure and trip tiesel Generator if prealls below the trip sef 30 psi.	ng or lube he ssure
4.3.1.1	To stop Tra Electrical	in A (B) Diesel Genera Auxiliary Board:	tor from the
	a. DEPRES	S Stop Pushbutton 1-HS	-4571B (4572B),
	b. OBSERV	E generator voltage dr	ops to zero,
		the Unit/Parallel Swit T, momentarily.	ch 1-HS-4414B (4452B
4.3.1.2	To stop Tra Generator B	in A (B) Diesel Genera uilding:	tor from the Diesel
	a. At the LOCAL/	Generator Control Pan REMOTE Switch 1-HS-451	el, PLACE the 6 (4517) to LOCAL,
		Engine Control Panel, tton 1-HS-4571A (4572A	
	c. CHECK	red STOPPING lamp lit,	
		the Unit/Parallel Swit T, momentarily,	ch 1-HS-4414A (4452A
		1-HS-4516 (4517) in REcation required.	MOTE; independent

OCEDURE NO.		REVISION		PAGE NO.	
VEGP	13145-1		20	14 of 43	
				**	
4.3.1.3	VERIFY the	following:			
	a. The Ge	enerator Spa	ce Heater i	s ON,	
	b. The Ja	icket Water I	Keep-Warm P	ump starts,	
	c. The Lu	be Oil Keep	-Warm Pump	starts.	
4.3.1.4	After appro UNIT AVAILA is off.	eximately 2 mag. BLE lamp is	ninutes, VE ON, and th	RIFY that the blue e red STOPPING light	
4.3.1.5	If after approximately 2 minutes, the red STOPPING light is NOT off, RESET as follows:				
		NO	TE .		
	f	andswitch is ront of the kid.			
	RUN/ST	the pushbutt OP, in the F imately 10 s	PUSH-TO-STO	88 (4689), DG1A (DG1E P position for	
	b. PLACE RUN/ST	the pushbutt OP, in the I	on 1-HS-46 PULL-TO-RUN	88 (4689), DG1A (DG1E position,	
	c. VERIFY UNIT A	the red STO VAILABLE lig	OPPING light in ON.	t is off and the blue	
4.3.1.6	If the UNIT following:	AVAILABLE 1	amp does n	ot light, CHECK the	
	a. Power	available st	atus light	s ON,	
	b. Genera reset,		itial Prote	ction Relay 186A	
	c. Emerge	ncy stop sig	gnal reset,		
	d. Oversp	eed trip res	et,		
	e. Starti	ng air press	sure is gre	ater than 210 psig,	
	f. Contro	l air pressu	re is grea	ter than 45 psig.	
4.3.1.7	CHECK that temperature	lube oil and s stabilize	l jacket co between 14	oling water 2° and 170°F.	
4.3.1.8	readiness,		klist 1 (2	returned to standby), "Diesel Generator	

PROCEDURE NO.		REVISION		PAGE NO.		-
VEGP	13145-1		20		15 of 43	

4.3.1.9 SHUT DOWN and ALIGN for STANDBY the Diesel Generator Building HVAC System per 13325-1 "Auxiliary Feedwater Pump House And Diesel Generator HVAC Systems"

NOTE

Accumulated water must be drained from the Fuel Oil Day Tank per Technical Specification 4.8.1.1.2.b.

- 4.3.1.10 If the Diesel Generator was operated for a period of one hour or more, SAMPLE the Diesel Generator Diesel Fuel Oil (DFO) Day Tank for water:
 - a. OBTAIN a clear container one liter size or larger,
 - b. DRAIN a small amount of fuel oil into the container from the DFO Day Tank Drain, 1-2403 "4-035 (036),
 - c. EXAMINE the sample for water on the bottom of the container.
 - d. If water is detected, REPEAT the sample until no water is found,
 - e. Independently verify locked closed 1-2403-U4-035 (036).
- 4.3.1.11 NOTIFY the Diesel Generator System Engineer of the Diesel Generator operation by dispatching the following:
 - a. A completed copy of Completion Sheet 1,
 - b. A copy of every completed 11885-C, "Diesel Generator Operating Log" if taken.

REVISION PAGE NO. 20 16 of 43 DIC OPERATION pisture Check CAUTIONS makile performing the cylinder pisture check the Diesel merator is not available r standby service. the Diesel Generator is of service for more than hour, ensure the action ms of Technical Specification vlinder moisture check ald not be performed if n action statement of nical Specification 1.1 or 3.8.1.2.

sion to remove Train A (B) Diesel standby.

r Control Panel, PLACE Local/Remote

ontrol Panel, DEPRESS Maintenance Mode

Fuel and Air Shutdown Cylinders fully

CAUTION

water is discovered in ake Air Manifold, the Unit Shift sor (USS) and inue this procedure he problem has been led and corrected.

ir Manifold for water by opening each s checking for water then closing: (428),

(432),

(426),

(430).

nder cocks.

4.4.1.1 KEQUE Gener 4.4.1.2 At the Switch 4.4.1.3 At the Pushlo	errodic operated a. While moistur Generated for st. b. If the out of one houtems 3.8.1 c. A cylishould in an		iesel ilable tor is ore than action pecification	3
4.4.1.1 KEQUE Gener 4.4.1.2 At the Switch 4.4.1.3 At the Pushlo	a. While moisture Genera for st. b. If the out of one houtems 3.8.1 c. A cyli should in an	e Check CAUTIONS performing the re check the Ditor is not availandby service. Diesel Generate service for more the of Technical Spare completed.	iesel ilable tor is ore than action pecification	
4.4.1.1 KEQUE Gener 4.4.1.2 At the Switch 4.4.1.3 At the Pushbase 4.4.1.4 VERIN	a. While moisture Genera for st. b. If the out of one houtems 3.8.1 c. A cyli should in an	e Check CAUTIONS performing the re check the Ditor is not availandby service. Diesel Generate service for more the of Technical Spare completed.	iesel ilable tor is ore than action pecification	
4.4.1.1 REQUE Gener 4.4.1.2 At th Switch 4.4.1.3 At th Pushb	a. While moisture General for st. b. If the out of one house items 3.8.1 c. A cyling should in an	CAUTIONS performing the re check the Ditor is not availandby service. Diesel Generate service for more the of Technical Spare completed.	iesel ilable tor is ore than action pecification	
4.4.1.1 KEQUE Gener 4.4.1.2 At th Switch 4.4.1.3 At th Pushb 4.4.1.4 VERIN	moistu Genera for st b. If the out of one ho items 3.8.1 c. A cyli should in an	performing the re sheck the Di tor is not avai andby service. Diesel Generat service for mour, ensure the of Technical Spare completed.	iesel ilable tor is ore than action pecification	
4.4.1.1 KEQUE Gener 4.4.1.2 At th Switch 4.4.1.3 At th Pushb 4.4.1.4 VERIN	moistu Genera for st b. If the out of one ho items 3.8.1 c. A cyli should in an	re check the Ditor is not availandby service. Diesel Generate service for modur, ensure the of Technical Spare completed.	iesel ilable tor is ore than action pecification	
4.4.1.1 REQUE Gener 4.4.1.2 At th Switch 4.4.1.3 At th Pushb	out of one horitems 3.8.1 c. A cyling should in an	service for mo our, ensure the of Technical Sp are completed.	ore than action pecification	
Gener 4.4.1.2 At th Switch 4.4.1.3 At th Pushb 4.4.1.4 VERIN	should in an		about 1	
Gener 4.4.1.2 At th Switch 4.4.1.3 At th Pushb 4.4.1.4 VERIN		action statemer cal Specificati 1 or 3.8.1.2.	med if	
Switch 4.4.1.3 At th Pushb 4.4.1.4 VERIN	EST permissi rator from s		rain A (B) Diesel	
Pushl 4.4.1.4 VERII	ne Generator ch 1-HS-4516	Control Panel (4517) in LOCA	, PLACE Local/Remote	
		ontrol Panel, DI -4577 (4578).	DEPRESS Maintenance Mod	е
exter	FY that the	Fuel and Air Si	Shutdown Cylinders full	У
		CAUTION		
	the Ir notify Superv discor until	y water is discontake Air Manife y the Unit Shif visor (USS) and ntinue this pro the problem ha ified and corre	fold, ft d ocedure as been	
4.4.1.5 CHEC of t	K the Intake he Drain Val	e Air Manifold lves checking f	for water by opening e for water then closing:	eac
a.	1-2403-X4-4	427 (428),		
ъ.	1-2403-X4-4	431 (432),		
c.	1-2403-X4-	425 (426).		
	1-2403-X4-			
		cylinder cocks.		

PROCEDURE NO.

VEGP 13145-1 20 PAGE NO.

17 of 43

NOTE

Any moisture in the Barring Device Air Filter should be removed by blowing down the filter.

- 4.4.1.7 OPEN 1-2403-X4-761 (724) the Air Receiver 1 Supply To Engine Barring Device.
- 4.4.1.8 UNLOCK the Pneumatic Barring Device by removing the lockout pin.

CAUTION

Any evidence of water in the engine during the following steps should be brought to the attention of the USS and this procedure should be discontinued.

- 4.4.1.9 ENGAGE the barring device and bar the engine over for two revolutions while monitoring the cylinder cocks for evidence of moisture.
- 4.4.1.10 CHECK all cylinder cocks for evidence of moisture.
- 4.4.1.11 DISENGAGE and LOCKOUT the Pneumatic Barring Device.
- 4.4.1.12 VERIFY the BARRING DEVICE ENGAGED annunciator alarm resets.
- 4.4.1.13 CLOSE 1-2403-X4-761 (724) Air Receiver 1 Supply To Engine Barring Device.
- 4.4.1.14 OPEN the Turbo Lube Oil Orifice Bypass Valve 1-2403-U4-130 (131) for approximately 30 seconds then clg:

NOTES

- a. Due to oiling of the cylinders, some oil is expected to be discharged from the cylinder head indicator cocks while rolling the engine.
- b. A small amount of moisture mist is expected to be discharged from the indicator cocks while rolling the engine.
- 4.4.1.15 DEPRESS the Engine Roll Pushbutton, and ROLL the engine on starting air for at least two revolutions.

ROCEDURE NO.		REVISION		PAGE NO.	******************************
VEGP	13145-1		20		18 of 43
	THE PERSON NAMED IN COLUMN 18 AND ADDRESS OF THE PERSON NAMED IN C	,		-	
4.4.1.16	CHECK all c	ylinder cock	s for ev	idence of mo	isture.
4.4.1.17	CLOSE all c	ylinder cock	s.		
4.4.1.18	DEPRESS the 1-HS-4575 (OPERATIONAL 4576).	mode pus	shbutton	
4.4.1.19	OBSERVE the	blue UNIT A	VAILABLE	light is li	t.
4.4.1.20	PLACE the L REMOTE.	OCAL/PEMOTE	Switch 1-	-HS-4516 (45)	17) in
4.4.1.21	COMPLETE Charlent	ecklist 3, "(Verification	Cylinder n'.	Moisture Che	eck
4.4.2	Emergency S	topping Train	n A (B) I	Diesel Genera	ator.
		CAUT	ION		
	t: a r	n Emergency S rip the Diese ll conditions e-starting th anually reset	el Genera s and wil ne engine	tor under	
4.4.2.1	To initiate Auxiliary B	an Emergency oard:	y Stop fr	om the Elect	trical
		S both Emerge 567B (4568B)			
	b. VERIFY	that generat	or volta	ige drops to	zero.
4.4.2.2	To initiate Building:	an Emergency	Stop fr	om the Diese	el Generato
	a. At the Stop Po	Engine Contrushbutton 1-F	col Panel RS-4567A	, DEPRESS En	nergency
	b. VERIFY	that red EME	ERCENCY S	STOP lamp ene	ergizes.
		NOTE	2		
	01	n Emergency S nly be reset ontrol Panel.	from the		
4.4.2.3		ngine has sto utton 1-HS-45			

4.4.2.4 VERIFY that the red EMERGENCY STOP lamp goes out.

Fuel Oil Day Tank 1:vel.

e.

PROCEDURE NO.		REVISION	IPAGE NO.
VEGP	13145-1	20	20 of 43
4.4.3.3	double th	Diesel Generator is to be ickness of new glass in to and DEPRESS the Reset I (4584).	the Emergency Start
4.4.3.4	VERIFY th	e Shutdown Systems Active	e light energizes.
4.4.3.5	SHUT DOWN 4.3.1.	the Diesel Generator per	r Sub-subsection
4.4.4	Adding Lu	be Oil To The Diesel Gene	erator Sump
		NOTES	
	a.	The Lube Oil Sump level go up approximately 1 is every 55 gallons of oil	nch for
	ъ.	Lube oil can be added to Diesel Sump Fill Connect while the diesel is oper or shut down,	tion
	с.	When adding oil to the special care should be prevent dirt and other contaminates from enter lube oil sump.	used to
4.4.4.2	ENSURE th	at the proper type of oi ding to the Diesel Gener	l has been provided ator.
4.4.4.2	MEASURE t	he sump level using the	dipstick.
4.4.4.3	Using an the sump the sump.	electric or hand-driven through the dipstick con	pump, ADD the oil to nection on the top of
4.4.4.4	MEASURE t	he sump level using the	dipstick.
4.4.4.5	VERIFY th	e sump level increases b	y the expected amount.
4.4.5	Switching Filter Wi	From In-Service Lube Oi th Diesel Generator In O	l Filter To Standby peration
4.4.5.1	Slowly OP 1-2403-U4	EN Lube Oil Duplex Filte -828 (831)	r Equalizing Valve
4.4.5.2	the stand	t the filter mounted pre by filter increase until System pressure.	ssure indicators on they read equal to

The LOW TEMP LUBE OIL IN annunciator may actuate due to cold lube oil from the standby filter. Disregard the alarm.

- 4.4.5.3 When the pressure indication on the standby filter has stabilized, slowly REPOSITION DIESEL GEN A (B) DUPLEX LUBE OIL FLTR INL and OUT Valves 1-2403-U4-826 (829) and 1-2403-U4-827 (830) until valves indicate mid position.
- 4.4.5.4 ALLOW lube oil flow through both filters to continue for 3 to 5 minute to ensure all air has been purged from the standby filter.

NOTE

If after switching to the Standby Lube Oil Filter, differential pressure remains high REPOSITION valves 1-2403-U4-826 (829) and 1-2403-U4-827 (830) to the mid position to allow flow through both filters.

- 4.4.5.5 CLOSE valve 1-2405-U4-828 (831); independent verification required.
- 4.4.5.6 CONTINUE to reposition valves 1-2403-U4-826 (829) and 1-2403-U4-827 (830) until the standby filter is fully in service. Pressure indication on the filter taken cut of service should decrease to zero.
- 4.4.5.7 INITIATE a Work Request Tag (WRT) to replace the filter taken out of service.
- 4.4.6 Switching From In-Service Fuel Oil Filter To Standby Filter With Diesel Generator In Operation

NOTE

The top part of the selection handle points to the Fuel Cil Filter that is in service.

4.4.6.1 Slowly REPOSITION selection handle on filter to the mid position.

If after switching to the Standby Fuel Oil Filter, differential pressure remains high, REPOSITION handle to the mid position to allow flow through both filters.

- 4.4.6.2 Slowly POSITION selection handle until the standby filter is fully in service.
- 4.4.6.3 INITIATE an WRT to replace the filter which was removed from service.
- 4.4.7 Switching From In-Service Fuel Oil Strainer To Standby Fuel Oil Strainer With Diesel Generator In Operation

NOTE

The top of the selector handle points to the Fuel Oil Strainer that is in service.

4.4.7.1 Slowly REPOSITION selector handle on strainer to the mid position.

NOTE

If after switching to the Standby Fuel Oil Strainer, differential pressure remains high, reposition handle to the mid position to allow flow through both strainers.

- 4.4.7.2 Slowly POSITION selection handle until the standby strainer is fully in service.
- 4.4.7.3 INITIATE an WRT to replace the strainer which was removed from service, if cleaning is required or differential pressure is high.

Voltage Regulator per Step 4.4.8.10.

the generator to the redundant bridge.

The diesel engine may be allowed to continue running while transferring the Bridge Transfer Switch.

a. ENSURE the Diesel Generator Output Breaker 1AA0219 (1BA0319) is open,

If generator voltage does not go up to normal TRANSFER

- b. DEPRESS the Emergency Shutdown Pushbutton 1-HS-4474 (4475) on PDG1 (PDG3),
- c. VERIFY the generator field volts are zero,

4.4.8.6

The Bridge Transfer Switch is located in the upper part of the left bay of PDG1 (PDG3).

- d. TRANSFER the Bridge Transfer Switch (S1) to the other bridge (1 or 2),
- e. DEPRESS the Exciter Enable Pushbutton 1-HS-4457 (4458).
- 4.4.8.7 DEPRESS the Field Flash Pubhbutton 1-HS-4459 (4460) for 3-5 seconds.
- 4.4.8.8 CHECK that generator volts raise to 4025-4330 volts.
- 4.4.8.9 If generator voltage does not go up.
 - a. SHUT DOWN the Diesel Generator,
 - b. INITIATE maintenance to repair the problem.

CAUTION

The Manual Voltage Regulator should not be used when the Diesel Generator is paralleled to the offsite grid.

4.4.8.10 If generator voltage goes up but does not stabilize between 4025 and 4330 volts, TRANSFER to the Manual Voltage Regulator.

NOTE

The Manual Voltage Regulator can only be controlled from the local panel.

- a. DEPRESS the Emergency Shutdown Pushbutton 1-HS-4474 (4475) on PDG1 (PDG3).
- b. VERIFY the generator field volts are zero,
- PLACE Local/Remote Switch 1-HS-4516 (4517) in LOCAL,
- d. DEPRESS the Manual Voltage Regulator Pushbutton 1-HS-4495 (4496),
- e. VERIFY the Manual Voltage Regulator light is on,
- f. DEPRESS the Exciter Enable Pushbutton 1-HS-4457 (4458).

EDURE NO	RE	VISION	PAGE NO.
VEGP	13145-1	20	25 of 43
			-
4.4.8.11	DEPRESS the F: 3-5 seconds.	ield Flash Pushbutto	n 1-HS-4459 (4460) fo
4.4.8.12	ADJUST the ger	nerator volts to 402	5-4330 volts.
4.4.8.13	PLACE the Loca REMOTE.	al/Remote Switch 1-H	S-4516 (4517) in
4.4.8.14	If the generat	tor volts do not go	to normal:
	a. SHUT DOWN	N the Diesel Generat	or,
	b. INITIATE Generator	maintenance to repa	ir the Diesel
5.0	REFERENCES		
5.1	P&ID's		
5.1.1	1X4DB170-1,	Diesel Generator S	ystem Train A
5.1.2	1X4DB170-2,	Diesel Generator S	ystem Train B
5.2	ONE-LINE DIAGR	AMS	
5.2.1	1X3D-AA-K01,	Diesel-Generators Meters	lA & 1B Relays &
5.3	ELEMENTARY DRA	WINGS	
5.3.1	1X3D-BA-D02D,	4160V Incm. Brkr 1 Emergency Diesel G	
5.3.2	1X3D-BA-D03D,	4160V Incm. Brkr 1: Emergency Diesel G	
5.3.3	1X3D-BA-M10B,	Class lE Train A M	anual Synchronization
5.3.4	1X3D-BA-M10C,	Class 1E Train B M	anual Synchronization
5.3.5	1X3D-BH-G03A,	Diesel Generator 1	A Cabling Block
5.3.6	1X3D-BH-G03B,	Diesel Generator 11 Diagram	B Cabling Block
5.3.7	1X3D-BH-G03C,	Diesel Generator 1	A Engine Controls
5.3.8	1X3D-BH-G03D,	Diesel Generator 1	A Engine Controls
5.3.9	1X3D-BH-G03E,	Diesel Generator 1	A Engine Controls

PROCEDURE NO. VEGP	13145-1	EVISION PAGE NO. 26 of 43
5.3.10	1X3D-BH-G03F,	Diesel Generator lA Alarms
5.3.11	1X3D-BH-G03G,	Diesel Generator 1A Relays and Governor
5.3.12	1X3D-BH-G03H,	Diesel Generator lA Voltage Regulator
5.3.13	1X3D-BH-G03J,	Diesel Generator 1A Generator Controls
5.3.14	1X3D-BH-G03M,	Diesel Generator 1B Engine Controls
5.3.15	1X3D-BH-G03N,	Diesel Generator 18 Engine Controls
5.3.16	1X3D-BH-G03P,	Diesel Generator 1B Engine Controls
5.3.17	1X3D-BH-G03Q,	Diesel Generator 1B Alarms
5.3.18	1X3D-BH-G03R,	Diesel Generator 1B Relays and Governor
5.3.19	1X3D-BH-G03S,	Diesel Generator 1B Voltage Regulator
5.3.20	1X3D-BH-G03T,	Diesel Generator 1B Generator Controls
5.4	CONTROL LOGIC	DIAGRAMS
5.4.1	1X5DN107-2,	Diesel Generator Engine
5.4.2	1X5DN107-3,	Diesel Generator Excitation
5.4.3	1X5DN107-4,	Diesel Generator Engine Auxiliaries
5.4.4	1X5DN107-5,	Diesel Generator Engine Auxiliaries
5.5	VENDOR DRAWIN	GS
5.5.1	1X4AK01-25,	Exhaust, Intake & Crankcase Piping Schematic
5.5.2	1X4AK01-26,	Jacket Water Piping Schematic
5.5.3	1X4AK01-27,	Lube Oil Piping Schematic
5.5.4	1X4AK01-28,	Fuel Oil Piping Schematic
5.5.5	1X4AK01-29,	Starting Air Piping Schematic
5.5.6	1X4AK01-31,	Engine Control Logic Diagram
5.5.7	1X4AK01-42,	Engine Control Panel Installation
5.5.8	1X4AK01-44,	Engine Control Panel Schematic
5.5.9	1X4AK01-45,	Engine Control Panel Schematic

PROCEDURE NO.		VISION	PAGE NO.
VEGP	13145-1	20	27 of 43
5.5.10	1X4AK01-46,	Engine Control Panel	0-1
5.5.11	1X4AK01-48,	Engine Control Panel	
5.5.12	1X4AK01-49,	Engine Control Panel	Schematic
5.5.13	1X4AK01-50,	Engine Control Panel	Schematic
5.5.14	1X4AK01-52,	Engine Control Panel	Schematic
5.5.15	1X4AK01-291,	Standby Diesel-Gen MC View	CC 1NBI, 1NBO Front
5.5.16	1X4AK01-292,	Standby Diesel-Gen Ir For M.C.C.	nterconnection Diag.
5.5.17	1X4AK01-293,	Standby Diesel-Gen Ir For M.C.C.	nterconnection Diag.
5.5.18	1X4AK01-294,	Standby Diesel-Gen El	lem. Diag. M.C.C.
5.5.19	1X4AK01-295,	Standby Diesel-Gen El	lem. Diag. M.C.C.
5.5.20	1X4AK01-296,	Standby Diesel-Gen El	
5.5.21	1X4AK01-297,	Diesel-Gen. Local Cor	
5.5.22	1X4AK01-302,	Gen. Control Panel On	
5.5.23	1X4AK01-313,	Standby Diesel Gen. (Panel Components Bill	Generator Control
5.5.24	1X4AK01-315,		
5.5.25	1X4AK01-317,	Engine & Skid Electr	ical Schem. & Wiring
5.5.26	1X4AK01-318,		
5.5.27	1X4AK01-355.		
5.5.28	1X4AK01-356,		C. Schematic
5.5.29			
5.5.30	1X4AK01-358,		
5.5.31		Standby Diesel Gen. 1	
5.5.32	1X4AK01-438,	Gen. Control Panel N	ameplate Schedule
5.5.33	1X4AK01-439,	Generator Control Sc	hematic

ROCEDURE NO.	REV	VISION	PAGE NO.
VEGP	13145-1	20	28 of 43
		-	
5.5.34	1X4AK01-440,	Generator Control Sch	nematic
5.5.35	1X4AK01-441,	Generator Control Sch	nematic
5.5.36	1X4AK01-442,	Generator Control Sch	nematic
5.5.37	1X4AK01-443,	Engine Pneumatic Sche	ematic
5.5.38	1X4AK01-458,	Instrument Ident. Sch Support Systems	ned. For Engine
5.5.39	1X4AK01-528,	Starting Air Comp. Co	ontrol Schematic
5.6	VENDOR MANUALS		
5.6.1	AX4AK01-509,	Standby Diesel Gen. 1	Instruction Manual
5.6.2	AX4AK01-510,	Standby Diesel Gen. I Manual	Diesel Engine Parts
5.6.3	AX4AK01-563,	Standby Diesel Gen. Publications Instruct	Associated tion Manual, Book 1
5.6.4	AX4AK01-564,	Standby Diesel Gen. Publications Instruc	Associated tion Manual, Book 2
5.7	PROCEDURES		
5.7.1	11885-C,	"Diesel Generator Ope	erating Log"
5.7.2	13150-1,	"Nuclear Service Coo	ling Water System"
5.7.3	13325-1,	"Auxiliary Feedwater Diesel Generator Bui	Pump House And
5.7.4	13427-1,	"4160V AC 1E Electri System"	cal Distribution

END OF PROCEDURE TEXT

TABLE 1

D/G VALID TEST AND FAILURE EVALUATION CRITERIA

Valid tests and failures (per Regulatory Guide 1.108, Section C.2.e and Technical Specification 4.8.1.1.3) shall be based on the following criteria:

- 1. All start attempts (automatic, including those from bona fide signals, or manual) that result in a failure to start, except as noted in (2) below, should be considered valid tests and failures.
- 2. Unsuccessful start and load attempts that can definitely be attributed to operating error, to spurious operation of a trip that is bypassed in the emergency operating mode, to malfunction of equipment that is not operative in the emergency operating mode (e.g., synchronizing circuitry) or is not part of the defined Diesel Generator unit design should not be considered valid tests or failures.
- 3. Successful starts, including those initiated by bona fide signals, followed by successful loading (sequential or manual) to at least 50% of continuous rating and continued operation for at least one hour should be considered valid successful tests. (Failures occurring after one hour are not considered valid failures.)
- 4. Successful starts that are terminated intentionally without loading, as defined in (3) above, should not be considered valid tests or failures.
- 5. Successful starts followed by an unsuccessful loading attempt should be considered valid tests and failures, except as noted in (2) at 2.
- 6. Tests that are terminated an intionally before completion as defined in (3) above because of an alarmed abnormal condition that would ultimately have resulted in Diesel Generator damage or failure should be considered valid tests and failures.
- 7. Tests performed in the process of troubleshooting should not be considered valid tests. Tests that are performed to velify correction of the problem should be considered valid tests and successes or failures, as appropriate.
- 8. Cranking and venting procedures that lead to the discovery of conditions (e.g., excessive water or oil in a cylinder) that would have resulted in the failure of the Diesel Generator unit during test or during response to a bona fide signal should be considered a valid test and failure.

VEGP	13145-1	REVISION 20	1	PAGE NO.	0 of 43
		COMPLEMENT	-	Sheet	1 of 1
		COMPLETION SHEET			
TO:		ERATOR SYSTEM ENGINE			
		SUPERVISOR (UNIT 1)			
Diesel G	enerator Tes	ted: [] DG1A	1) DG1B	
Start Da	te: _ / /		Shutdown	Date:	1 1
Start Ti	me:		Shutdown	Time:	
Start En	gine Hours:	Shutdown			
		rbocharger prelubric			
	or start:				
[] Main	tenance Troul	blshooting	[] Func	tional Te	etine
		[] Other:		cavilar re	
Reason f	or trip or fa	ailure to start:			
[] Manu	al [] Equip	ment failure() Trip	p signal	[] Alarm	Respon
DR# (if	known)_		# (If Kn	own)	
wast any	conditions to start:	that would have resu		Diesel G	enerato
Comments	11				
Complete	d Not				
Reviewed			-	Date	Time
	Unit Sh	ift Supervisor	-	Date	Time
Diesel G	Senerator Sta	rt Evaluation:			
	essful Start		[]	Valid Te	st
	d Failure		[]	Non-Vali	d Test
I J Non-	Valid Failur	e	Uni	t Shift S	upervie
Copy ser	it to			- Ditter 5	/ /
Diesel (Generator Sys	tem Engineer	Shi	ft Clerk	Dat

Procedur	re No.	Revision		Page No.
	VEGP 13145-1		20	31 of 43
				Sheet 1 of 6
		CHEC	KLIST 1	
	TRAIN A D	IESEL GENERATOR	STANDBY MODE STATUS CH	ECK
ENG	INE CONTROL PANEL - PDG2		STATUS	INITIALS
1.	All annunciator windows		No unexpected alarms	
2.	Starting Air Pressure:			
	a. Left Bank 1-PI-9056		220-255 psig	
	b. Right Bank 1-PI-905	2	220-255 psis	
3.	Control Air Pressure 1-P	1-19174	58-62 psig	
4.	UNIT AVAILABLE Light		ON	
5.	Thermocouple Selector:			
	a. Lubricating Oil In		142-170°F	
	b. Lubricating Oil Out		142-170°F	
	c. Jacket Water In		142-170°F	
	d. Jacket Water Out		142-170°F	

Procedure No. Revision Page No. 32 of 43 20 13145-1 VEGP Sheet 2 of 6 CHECKLIST 1 TRAIN A DIESEL GENERATOR STANDBY MODE STATUS CHECK INITIALS IV STATUS ENGINE CONTROL PANEL - PDG2 POWER AVAILABLE Lights: ON a. ON b. ON OFF STOPPING LIGHT STATUS GENERATOR CONTROL PANEL - PDG1 Center Unit/Parallel Switch 1-HS-4414A After Unit REMOTE Local/Remote Switch 1-HS-4516 Lockout Relays: 3. RESET 186A RESET 186B b. RESET 186C C. Voltage Regulator Automatic Voltage Regulator Light ON a.

OFF

Manual Voltage Regulator Light

b.

Procedure No.	Revision	Page No.
VEGP 13145-1	20	33 of 43

Sheet 3 of 6

CHECKLIST 1

TRAIN A DIESEL GENERATOR STANDBY MODE STATUS CHECK

TOM	OR CONTROL CENTER INBI	STA? 3	INITIALS
1.	Air After Cooler Fan No. 1	AUTO	
2.	Air Compressor No. 1	AUTO	
3.	Air After Cooler Fan No. 2	AUTO	
4.	Air Compressor No. 2	AUTO	
5.	Jacket Water Circulating Pump	AUTO	
6.	Jacket Water Heater	AUTO	
7.	Lube Oil Circulating Pump	AUTO	
8.	Lube Oil Heater	AUTO	
9.	Generator Space Heater	AUTO	

Procedure	No.		Revision:		Dece No		
	VEGP 1314	45-1		20	Page No.	34	of 43
				CHECKLIST 1		Sheet 4	of 6
		TE THE A DIE	CEI CEMEI	RATOR STANDBY MODE STATU	o ource		
			SOLL GENE		S CHECK		
DIE	SEL GENERATOR SE	CID - DGIA		STATUS		INITIALS	- IA
1.	Governor Setti	ings					
	Speed Droop			2.6			
	Load Limit			MAX FUEL			9-
	Speed			14.34			
	Oil Level			Above centerl of sight glas			
2.	Overspeed Trip (Located under Turbocharger)			58-62 psig			
3.	Lube Oil Level	l - Dipstick		MAX STATIC ±1			
4.	Run/Stop Switc	ch 1-HS-4688		PULL-TO-RUN			1
5.	Generator Bear	ring Oil Leve	1	Centerline of sight glass o above			
6.	Turhocharger E	Bearings					
	a. Right Bar	nk Sight Glas	s	Flowing			
	b. Left Bank	Sight Glass		Flowing			
	b. Left Bank	C Sight Glass		Flowing			

Procedur	e No.		Revision		Page No.		
	VEGP	13145-1		20		35	of 43
						Sheet 5	of 6
			CHE	CKLIST 1			
		TRAIN A	DIESEL GENERATO	R STANDBY MODE STA	ATUS CHECK		
UPS	TAIRS			STATUS		INITIALS	IV
1.	Intake	Air Filter					
	a. Sc	reens		Unobstructe	ed		
	b. 0i	l Level Sight Gl	ass	Half Fu	11		
2.	Exhaust	Silencer		No Combusti in Room	ibles		
ELE	CTRICAL C	ONTROL PANEL QEA	B - MAIN CONTRO	L ROOM			
1.	DSL GEN 1-HS-44	1A UNIT/PARALLE	L Switch	NORMAL AFTER UNIT			
2.	SYNC MO	DE SELECTOR Swit	ch 1-TS-DG1A	AUTO			
3.	DG1A OU	TPUT BRKR 1-HS-1	AA0219	AUTO			
4.	DFO DAY	TANK LEVEL 1-LI	-9018	52-1007			

Procedure	No.		Revision		Page No.	
	VEGP	13145-1		20	Page No.	36 of 43
			CH	ECKLIST 1		Sheet 6 of 6
4160	V AC SWGR	1AA02 - CONTR	OL BLDG LVL A	STATUS	INIT	TIALS IV
1.	1AA02-19	10A FUSE REMO	OTE BKR CKT(AY)	INSTALLED		
2.		10A FUSE REM	OTE BKR CKT(AZ)	INSTALLED		
3.		15A BKR BREAK	KER CONTROL	CLOSED		
4.		EMERGENCY DG	LA INC BRKR	RACKED IN		
5.			OR POWER SWITCH ON SPRINGS CHARGED	ON/CHARGED		
6.	DIESEL GE 1-HS-1AA0		CONT SELECT SWITCH	CONT RM		
	Comments					
			78			
	Completed	By:				
					Date	Time
	Reviewed	Ву:			Date	Time

Procedure No.		Revision		Page No.	
VEGP	13145-1		20		37 of 43
					Sheet 1 of 6
		CHECKI	JIST 2		
	TRAIN B	DIESEL GENERATOR S	STANDBY MODE ST	TATUS CHECK	

ENG	INE CONTROL PANEL - PDG4	STATUS	INITIALS
1.	All annunciator windows	No unexpected alarms	
2.	Starting Air Pressure:		
	a. Left Bank 1-PI-9057	220-255 psig	
	b. Right Bank 1-PI-9053	220-255 psig	
3.	Control Air Pressure 1-PI-19175	58-62 psig	
4.	UNIT AVAILABLE Light	ON	
5.	Thermocouple Selector:		
	a. Lubricating Oil In	142-170°F	
	b. Lubricating Oil Out	142-170°F	
	c. Jacket Water In	142-170°F	
	d. Jacket Water Out	142-170°F	

rocedure No.	Revision		Page No.	
VEGP 13145		20	Page No.	38 of 43
			5	Sheet 2 of 6
	CHEC	CKLIST 2		
	TRAIN B DIESEL GENERATOR	STANDBY MODE STATUS (CHECK	
ENGINE CONTROL PANEL	- PDG4	STATUS	INITIA	LS IV
6. POWER AVAILABLE	Lights:			
a. A		ON		
b. B		ON		
c. C		ON		
7. STOPPING LIGHT		OFF		
GENERATOR CONTROL PA	NEL - PDG3			
1. Unit/Parallel S	witch 1-HS-4452A	CENTER AFTER UNIT		
2. Local/Remote Sw	itch 1-PS-4517	REMOTE		
3. Lockout Relays:				
a. 186A		RESET		
b. 186B		RESET		
c. 186C		RESET		
4. Voltage Regulate	or			
a. Automatic	Voltage Regulator Light	ON		
b. Manual Vol	tage Regulator Light	OFF .		

ocedure N	No.	Revision		Page No.	
	VEGP 13145-1		20		39 of 43
					Sheet 3 of 6
		CHECKL	IST 2		
	TRAIN B DIE	ESEL GENERATOR S	TANDBY MODE STA	TUS CHECK	
MOTOR	R CONTROL CENTER 1NBO		STATUS	INI	TIALS
1.	Air After Cooler Fan No. 1		AUTO		
2.	Air Compressor No. 1		AUTO		
3.	Air After Cooler Fan No. 2	2	AUTO		
4.	Air Compressor No. 2		AUTO		
5.	Jacket Water Circulating H	Pump	AUTO		
6.	Jacket Water Heater		AUTO		
7.	Lube Oil Circulating Pump		AUTO		
8.	Lube Oil Heater		AUTO		

AUTO

Generator Space Heater

Procedure No. Revision Page No. 20 40 of 43 13145-1 VEGP Sheet 4 of 6 CHECKLIST 2 TRAIN B DIESEL GENERATOR STANDBY MODE STATUS CHECK INITIALS IV DIESEL GENERATOR SKID - DG1B STATUS Governor Settings 2.6 Speed Droop MAX FUEL Load Limit 12.2 Speed Above centerline of Oil Level sight glass 58-62 psig Overspeed Trip Air Press 2. (Located under right bank Turbocharger) Max Static ±1" Lube Oil Level - Dipstick 3. Run/Stop Switch 1-HS-4688 PULL-TO-RUN 4. Generator Bearing Oil Level Centerline of 5. sight glass Turbocharger Bearings 6. Right Bank Sight Glass Flowing Flowing Left Bank Sight Glass

Procedu	re No.	Revision		In		
	VEGP 13145-1		20	Page No.	41	of 43
					Sheet 5	of 6
		CHECK	CLIST 2			
	TRAIN B	DIESEL GENERATOR	STANDBY MODE STATUS	CHECK		
UPS	TAIRS		STATUS		INITIALS	IV
1.	Intake Air Filter					
	a. Screens		Unobstructed			
	b. Oil Level Sight Gl	ass	Half Full			
2.	Exhaust Silencer Room		No Combustibles in Room	8		
ELE	CTRICAL CONTROL PANEL QEA	B - MAIN CONTROL	ROOM			
1.	DSL GEN 1B UNIT/PARALLE 1-HS-4452B	L Switch	NORMAL AFTER UNIT			
2.	SYNC MODE SELECTOR Swit	ch 1-TS-DG1B	AUTO			ALC: N
3.	DG1B OUTPUT RKR 1-HS-1B	A0319	AUTO			
4.	DFO DAY TANK LEVEL 1-LI	-9019	52-1002			

Procedure No.		Revision		Page No.	
VEGP	13145-1		20		42 of 43
					Sheet 6 of 6
		СН	ECKLIST 2		
4160V AC SWGR	1BA03 - CONTRO	OL BLDG LVL A	STATUS	INI	TIALS IV
1. 1BA03-19	10A FUSE REM	OTE BKR CKT(AY)	INSTALLED		
2.	10A FUSE REMO	OTE BKR CKT(AZ)	INSTALLED		<u> </u>
3.	15A BKR BREAK	KER CONTROL	CLOSED		
4.	EMERGENCY DG	LB INC BRKR	RACKED IN		
5.		OR POWER SWITCH ON SPRINGS CHARGED	ON/CHARGED		
	ENERATOR BRKR (-HS-1BA0319B	CONTROL SELECT	CONT RM		
Comments					
Complete	d By:			. Date	Time
Reviewed	By:				
			AND STREET	Date	Time

 PROCEDURE NO.
 REVISION
 PAGE NO.

 VEGP
 13145-1
 20
 43 of 43

Sheet 1 of 1

CHECKLIST 3

CYLINDER MOISTURE CHECK INDEPENDENT VERIFICATION

NOTES

- a. This checklist is written for Train A component designations. Train B designations are shown in parenthesis.
- b. When performing this checklist, circle the number of the component (Train A or B) that was actually checked.

DIESEL (ENERATOR:

COMPONENT	DESCRIPTION	POSITION	INITIALS
1-2403-X4-761 (1-2403-X4-724)	AIR RECEIVER #1 TO ENG BARR DEVICE	CLOSED	
1-2403-U4-130 (1-2403-U4-131)	TURBO LUBE OIL ORIFICE BYPASS	CLOSED	/
1-HS-4516 (1-HS-4517)	LOCAL/REMOTE	REMOTE	/_IV
	FUEL SHUTDOWN CYLINDER	FULLY RETRACTED	
	AIR SHUTDOWN CYLINDER	FULLY RETRACTED	
1-2403-X4-427 (1-2403-X4-428)	RIGHT BANK INTAKE MANIFOLD DRAIN	CLOSED	
1-2403-X4-431 (1-2403-X4-432)	RIGHT BANK INTAKE MANIFOLD DRAIN	CLOSED	
1-2403-X4-425 (1-2403-X4-426)	LEFT BANK INTAKE MANIFOLD DRAIN	CLOSED	
1-2403-X4-429 (1-2403-X4-430)	LEFT BANK INTAKE MANIFOLD DRAIN	CLOSED	/_IV
Performed By:		DATE	TIME
Verified By:	-	DATE	TIME
Reviewed By: OSOS o	r USS	DATE	TIME