A 06/20/78

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LTR 1 ENCL 1

SUBJECT:
RESPONSE TO NRC LTR OF 12/15/78... FORWARDING APPLICANT"S COMPLETED QUESTIONNAIRE FOR NRC RELIABILITY STUDY OF STANDBY DIESEL GENERATOR UNITS.

PLANT NAME: ST LUCIE #1
REVIEWER INITIAL: XJM
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****************** DISTRIBUTION OF THIS MATERIAL IS AS FOLLOWS ******************

RELIABILITY OF STANDBY DIESEL GENERATOR UNITS.
(DISTRIBUTION CODE A014)

FOR ACTION: ~~BR CHIEF~~ ORB#4 BC**W/3 ENCL

INTERNAL: REG FILE**W/ENCL
NRC PDR**W/ENCL
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OELD**W/ENCL
HANAUER**W/ENCL
POWER SYS BR**W/ENCL
F CLEMENSON**W/ENCL
DIS SER BR-MC**W/ENCL

EXTERNAL: LPDR'S
FT PIERCE, FL**W/ENCL
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50-390 TENNESSEE VALLEY AUTHORITY WATTS BAR #1

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C

04/10/78

ACCESSION NBR: 78103-0071 TASK NBR:
DOCUMENT TYPE: LETTER FICHE NBR :
DOCUMENT SIZE: 1P+1P NOTARIZED: Y
DOCKET DATE: LPDR: Y
REPORT NBR:
RECP: VARGA S A RECP AFFILI
ORG: MILLS L M ORG AFFILIA

SUBJECT: FORWARDING ADDIDAVIT SHOWING SVC OF
SAFETY ANALYSES REPT SERVED UPON, M
OFFICE, NASHVILLE, TN. ET AL...NOTA

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04/10/78

ACCESSION NBR: 78104-0092 TASK NBR:
DOCUMENT TYPE: LETTER FICHE NBR :
DOCUMENT SIZE: 3P+2P NOTARIZED:
DOCKET DATE: LPDR: Y
REPORT NBR:
RECP: RECP AFFILI
ORG: CASE E G ORG AFFILIA

SUBJECT: ADVISING THAT NRC HAS FORWARDED TO
FEDERAL REGISTER A NOTICE OF MEETIN
¤IMPLEMENTATION OF 10 CFR 73.55 REQU
RESEARCH FOR PHYSICAL PROTECTION OF
IN NUC. PWR. REACTORS AGAINST SABOT

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04/11/78

ACCESSION NBR: 77313-0271 TASK NBR:
DOCUMENT TYPE: MEMO FICHE NBR :
DOCUMENT SIZE: 1P NOTARIZED:
DOCKET DATE: LPDR:
REPORT NBR:
RECP: VASSALLO D B RECP AFFILIA
ORG: ROSS D F ORG AFFILIAT

SUBJECT: SECOND ROUND QUESTIONS.

P. O. BOX 013100, MIAMI, FL 33101

FLORIDA POWER & LIGHT COMPANY

June 16, 1978
L-78-207

US NRC
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NRC DISTRIBUTION
SERVICES UNIT

Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Sir:

Re: St. Lucie Unit No. 1
Docket No. 50-335
Diesel Generator Information

The attached information is submitted in response to a letter from Karl R. Goller dated December 15, 1977.

Very truly yours,

J. A. DeMastry
for

Robert E. Uhrig
Vice President

REU/MAS/bb

Attachment

cc: Mr. James P. O'Reilly, Region II
Harold F. Reis, Esquire

A014
S
1/1

Questionnaire

for

NUCLEAR REGULATORY COMMISSION
RELIABILITY STUDY

of

Standby Diesel Generator Units

Date Questionnaire Completed: 6/15/78

Plant Name: St. Lucie Unit No. 1

Diesel Manufacturer: General Motors Model: 12-645E4 & 16-645E4 turbo charged

Number of Units: 2 (each with 1 generator and 2 diesels in tandem ; 1 12-cylinder 1 16-cylinder)

Size Kw/Unit: 3500 Rated Speed: 900

Average Operating Hours Per Unit to Date: 1A-186/1B-149

DIESEL GENERATOR STATUS

A. Engine:

1. Problems are caused chiefly by (give estimated number) see Item V.

   a. Defective parts ________
   b. Installation errors: ________
   c. Failure of system to respond properly in function or sequence: ________
   d. Faulty adjustment: ________

2. Would more stringent inspection and testing requirements during acceptance or preoperational tests significantly improve the diesel-generator power plant performance?
   Yes ______ No X

B. Starting Systems (indicate which):

1. Air-to-cylinder cranking. ______
   Air cranking motor X Mfr. Ingersoll Model No. D-89RH-46
   Electric cranking motor ____ Mfr. ______ Model No. ____

2. If air cranking, then:

Give size of starting air tank: Volume ~~Length~~ 32 ft^3. Diameter 30"

Normal standby air tank pressure 200-220 psi.

Is pressure reducer used? Yes ____ No x
Reducer pipe size? ______ inches.

Starting air control admission valve pipe size in air piping system, 2 inches.

Minimum air tank pressure for engine cranking ~110 psi.

Number of five-second cranking periods between above pressures with no tank recharging 10 starts minimum

Number of air tanks per engine 4 per unit

Can starting air tanks serve more than one engine?
Yes ______ No x

Is air pipe to engine from top of air tank? Yes _____ No ~¼ of the way up from tank bottom

Does starting air tank have water condensate drain?
Yes x No ___

Does starting air pipe have water condensate trap and drain near engine? Yes x No ___

Is starting air piping horizontal? Yes x No ____

Does it slant toward drain? Yes ____ No x

If water condensate drains are provided, then is draining:

a. Automatic through float valve? Yes x No ___
b. Manual by hand valve? Yes x No ___
c. If manual, then is draining water condensate done:

daily? ____
weekly? ____
monthly? ____
before each start if manual? x
no procedure? ____

Is dirt and rust filter provided in starting air pipe?
Yes x No ____

If provided, where installed? in pipe before hoses to air start motors.

How is it cleaned? remove plug and filter and clean. Y strainer

How often and when? as needed; high delta-P

Give pipe size of filter: 2 inches.

How is it known whether filter is plugged or has high pressure drop? Flow blockage. Note: have redundant parallel filters.

Is starting air pipe to engine positioned:

a. Below floor? x
b. On the floor? ____
c. Overhead? ____

What is air pressure drop from air tank to engine during cranking ~5 psi

Give approximate length (nearest ten feet) of starting air pipe for individual engine or all engines from air tank to:

a. Nearest engine 20 feet
b. Furthest engine 40 feet

Diameter of starting air pipe from:

a. Air tank to starting valve 2 inches
b. At air starting valve 2 inches
c. At engine 1 inches hose to each starter, 4 per engine, 8 per unit.

What is the primary source of power for the starting air system? electrical; auto start controlled by pressure switches.

Is there a duplicate and redundant motor and air compressor set? Yes x No ___

What is the time required to recharge one air tank? 15 minutes

2 tanks for 2 air motors on each engine; connected with check valves so that less of 1 tank will not bleed down all tanks.

Does starting air supply system have independent secondary power supply for compressor? Yes x No ___

If yes, then by:

a. Gasoline engine? ___
b. Motor driven?
c. Other? (Specify) Diesel driven manual start compressor.

3. If electric (Battery powered) cranking, then N/A

a. Battery charging: Continuous trickle charger ___
Intermittent charging ___

If so, how is charging requirement determined?

Time cycle ___
Test ___
Other ___

b. Battery used: Common Plant ___
Individual Unit ___
Other ___

Starting cable size ___ ; Length: Battery to engine (longest) ___

C. <u>Fuel Oil System</u>: Bulk Tank to Day Tank

1. Does the bulk tank to day tank fuel supply system (viz: pump, motor, etc.) have redundant independent power supplies? Yes _x_ No ____

   Does this system have a hand-operated emergency fuel pump? Yes ____ No _x_ Day tanks can be gravity filled.

   If yes, is this hand-operated pump and piping in immediate operating condition? Yes ____ No ___ N/A

2. Is there a water and sediment drain from the very bottom of the:

   a. Bulk tank? Yes _x_ No ____
   b. Day tank? Yes _x_ No ____

3. Is the regular functional fuel oil outlet slightly above (two to three inches) the bottom of the:

   a. Bulk tank? Yes _x_ No ____
   b. Day or integral tank? Yes _x_ No ____

4. Is bottom of day tank and/or integral tank above all parts and piping of the engine fuel injection systems? Yes ____ No _x_

   If yes,

   Give approximate amount inches ____ feet ____

5. Does the engine fuel system have a fuel bleed return line to the fuel day tank and/or integral tank? Yes _x_ No ____

   During extended operation, such as more than two to three hours, does the fuel in the day tank become: (yes or no)

   a. Warm? _yes_
   b. Hot? _no_ (above 130°F)

What is fuel oil return line size (nominal)?

a. Pipe size 3/4 inches
b. Tubing size ____ inches

6. Do engine fuel oil filters have air bleed or vent valves readily accessible? Yes ____ No x

7. How is fuel transferred from day tank to engine fuel system?

a. By gravity back up
b. Engine driven pump ____
c. Electric motor driven pump x
d. Is a manual pump also provided for injection system filling and/or air venting after servicing or replacement of parts in the fuel injection system? Yes x No ____

If yes, is the manual pump in immediate operating condition? Yes x No ____

8. Type of fuel (e.g., #1, #2, #3, JP-4, etc.) #2 diesel fuel

9. Approximate bulk tank capacity, 20,000 gallons. each

10. Typical frequency of refilling (weekly, monthly, etc.) 2-3 mos.

11. Typical refill (gallons), 2500 each

D. Lube Oil System

1. Lube oil

a. Type SA#40
b. Viscosity D88 or D446 (1010 SSU at 100°F)
c. Specification number D567, D92 & D97 (Texaco 1663 and 1570)
d. Oil change determined by: Hours of operation combined with oil analysis

Time interval: Yes ____ No ____
Give interval ____________ monthly, yearly
By oil analysis: Yes _____ No ____

2. Lube oil filters are:

   a. Full flow __x__
   b. Bypass ________
   c. Combination _______

3. Interval and/or basis for changing filter cartridge:

   a. Monthly ________
   b. Yearly __x__
   c. By running time _______ hours
   d. By oil analysis. Yes ____ No ____
   e. By pressure drop. Yes ____ No ____
   f. Does provisions exist for changing cartridges during engine operation? Yes ___ No ___

4. Oil Pressure Monitoring See L.3

   a. Normal operating pressure ____ psi
   b. Alarm _____ psi
   c. Shutdown _____ psi

5. Oil temperature control: See L.4

   a. By standby heater in engine sump ________ °F.
   b. Heating means for maintaining standby temperature:

      Direct in oil ________
      Oil-to-water heat exchanger _______
      Other (Specify) _________________

E. <u>Cooling System - Engine Water</u>

1. Temperature control by:

   a. By thermostat in water? Yes __x__ No ____

      If yes, then:

      Bypass thermostat? Yes __x__ No ____
      Throttle thermostat? Yes ____ No __x__

b. By radiator shutter: No

- Automatic ____
- Manual ____
- Other (give type) ____________________

2. Corrosion control (water additive)? Yes __x__ No ____

If yes, give chemical additive or name of compound.

Nalcool 2000, recommended by vendor

Proportion or concentration control:

a. By additive measurement? Yes ____ No ____
b. By water coolant analysis? Yes __x__ No ____

3. Engine cooling water cooled by:

a. Radiator? __x__
b. Heat exchanger from sea, river or other water? ____
c. Other? (give type) ____________________

4. Engine cooling water temperature-monitoring

a. Standby temperature 110-120°F
b. Normal operating temperature 160-190 °F
c. Alarm temperature __N/A__ °F Low surge tank level at 6".
d. Shutdown temperature __205__ °F
e. Water circulation during standby:

Thermo-syphon __x__ (natural circulation)
Pump ____

5. Water Pressure Monitoring: Yes __x__ No ____

a. Alarm no ____ Local indication.
b. Shutdown __no__
c. Both ____

6. Water temperature Sensor Position:

   a. In piping from engine x
   b. In engine piping ____
   c. In engine direct ____

7. Water surge or supply tank in system. Yes x No ____

   If yes, then bottom connected to:

   a. Water pump suction? Yes x No ____
   b. Top of system? Yes ____ No x
   c. Both of above? Yes ____ No x
   d. Is bottom of surge tank above top of engine system? Yes ____ No x
   e. Does engine have constant air bleed from top of engine water piping to surge or supply tank? Yes x No ____
   f. Give size of bleed or vent line, ½ inches.
   g. Manual air bleed only? Yes x No ____ (from the tank)

F. <u>Governor - Speed Control</u>

Manufacturer Woodward
Electric (speed sensing) ~~x (speed sensing)~~
Hydraulic x (controls)
Type or code (such as EGB-35, LSG-10, etc.) EGB-10P
Automatic load sharing? Yes ____ No ____

1. Is compensation or stability control and/or speed of response manually adjustable? Yes ____ No x

   If yes, adjusted by:

   a. Eye and ear?
   b. Test and specification? ____
   c. Other? (Specify) ____

2. Engine - generator normal shutdown or stopping means and method.

Is the engine stopped:

a. Manually? Yes _x_ No ____

If yes, then:

Directly at engine? Yes ___ No ____
Through local control panel? Yes ___ No ___
Manually from control room is the normal method.

b. Automatically through the controls in the control room? Yes ___ No ___ Manual controls in control room initiate shutdown.

c. By setting governor to "fuel-off" position?
Yes _x_ No ___

d. By over-ride of governor settings and control position directly to fuel injection pumps?
Yes ____ No _x_

e. Other means. Describe briefly. ____________

____

3. When engine is stopped, is fuel control in:

a. Full fuel or maximum fuel position? ____
b. Full off or no fuel position? _x____
c. Intermediate? ________
d. Random? ________

(If not consistent and typical in above, then give the usual.)

4. When starting from the standby condition after shutdown for at least 24 hours, give number of seconds from start-to-crank to full fuel or maximum fuel position of governor and fuel control, __~1____ seconds.

G. Governor - Overspeed (shutdown)

1. Speed sensing?

    a. Electrical >200rpm
    b. Flyball <200rpm (mechanical control if electrical control lost)
    c. Other (Specify) ____________

2. Fuel shutoff force generated by:

    a. Spring? ✓
    b. Air? ____
    c. Hydraulic? ____
    d. Electrical? ____
    e. Other? (Specify) ____________

3. Overspeed sensing setting? (in terms of full speed)

    a. 115% ✓ (116%)
    b. 110% ____
    c. Other (Specify) ____________

4. Is overspeed tripping set point tested periodically?
    Yes ____ No ✓

    If yes, then how often? ________ (yearly, monthly, etc.)

H. 1. Generator Mfr. Electric Machinery Model No. Series 700
    Single bearing or two bearings? Two
    Does generator have damper windings? Yes ____ No ✓

2. Does generator have any obvious fault or difficulty?
    Yes ____ No x

    Is problem repetitive? Yes ____ No ____

    If yes, then describe briefly. ________________

I. Exciter and Voltage Regulator

1. Exciter Manufacturer: Electric Machinery Model CVT static exciter with SCR regulator.

   Type: Rotating ______________ Static x ______________

   If rotating drive? Direct _____
   Belt or Chain __________
   DC with field control __________
   Brushless with rectifier __________

2. Voltage Regulator: Manufacturer Electric Machinery Model same as 1

   Type: Mechanical ______________ Static x ______________

3. Are paralleled units of automatic load sharing control of fully automatic type? Yes ____ No ____ N/A

   If yes, has any obvious influence or interrelationship been noted between the stability and response time of the engine governor and the stability and voltage control of the generators? Yes ___ No ___

4. Have engine governor and voltage regulator/exciter adjustments been made on the site or under any conditions since any of the units have been placed in service? Yes x No ____

   If yes, by means of what tests and what standards? Give name or very brief description. Per vendor manual verified by test runs.

5. If any difficulties have occurred, give approximate number of problems. N/A

   a. Components ____
   b. Wiring ____
   c. Other (damage in service or dropping of miscellaneous hardware into switchboard, etc.) ______________

J. Paralleling: Engine-Generator Units N/A (Do not parallel the diesel generators)

1. Do all units consistently have the proper voltage output? Yes ____ No ____

2. Do all units automatically share both the "real" or in-phase load and also the reactive load reasonably well? Yes ____ No ___

3. At the same Kw load, are both the field and the armature line currents of the several units consistently close to the same value? Yes ____ No ____

   If no, approximate percent difference. ______________

4. Synchronizing

   a. In automatic synchronizing do circuit breakers close immediately after reaching full synchronous speed?
   Yes _______ No _____

   b. If "no" above then, does speed of some units drift slowly while failing to synchronize and close circuit breakers?

   How many seconds? _____________

   Occasionally ______
   Always ________
   Never ______

K. Switch Gear and Electrical Con (other than exciter/ voltage regulator)

1. If any difficulties have occurred, then give approximate number of problems.

   a. Components 4
   b. Wiring ______
   c. Other (damage in service or dropping of miscellaneous hardware into switchboard, etc.) _______
   d. Design concept faults. That is, does the switch gear and its controls perform the proper functions and in proper sequence and timing. _______

2. a. Do the on-site diesel generator units and related support equipment have any storage battery power systems for any service whatsoever? Yes ✓ No ___

   b. Identify each storage battery power system associated with the on-site diesel generator unit and its function. Re: FSAR Section 8.3.2.1. Main battery busses supply some control power.

   c. Does each system identified above adequately fulfill the service requirements for which it is intended? Yes ✓ No ___

   If no, briefly describe. ___

   d. Is there a DG battery maintenance program? Yes ✓ No ___

L. Safety Shut downs

Give safety shut down settings compared to equilibrium operating conditions.

1. Engine and generator speed. Give rpm or hertz:

   a. Synchronous and usual 900 rpm or 60 Hz
   b. Overspeed shutdown setting 1042 rpm or 69.5 Hz max.

2. Engine cooling water (see E.4)

   a. Equilibrium 160-190°F
   b. Alarm None °F
   c. Shut down 205 °F

3. Lube oil pressure (see D.4)

   a. Equilibrium 25-29 psi
   b. Alarm None psi (low level at 6" in oil sump)
   c. Shut down 17 psi

4. Lube oil temperature

   a. Equilibrium 125-155 °F in standby.

   b. Alarm None °F

   c. Shutdown None °F

5. Indicate all other protective interlocks (give name and;)

   a. Usual or proper condition [see (b)]

   b. Shutdown condition Generator differential, generator overcurrent, reverse power flow to generator, loss of generator excitation.

6. a. What source of power is provided to operate alarms and shutdown controls? (See G.2) 125V DC busses 1A & 1B

   b. Do the generator units automatically shutdown in case of the electrical power loss to its control system? Yes ____ No ✓ Output breaker stays closed; governor shifts to complete hydraulic control; regulator is powered from generator output.

M. Emergency or Alert Conditions

1. Are all safety shutdown and safety interlocks bypassed during emergency conditions? Yes ____ No x

2. If "no" above, then which are not bypassed. Name items. Engine overspeed and generator differential.

3. For each interlock not bypassed is coincident logic used? Yes ______ No ✓

   If yes, is it testable? Yes____ No ____

N. Maintenance

1. Does plant have regularly scheduled maintenance procedures? periodic cleaning & inspection.

   If so, return copy of these procedures with questionnaire.

2. When need for minor adjustments obviously exists, then:

   a. Is remedial action taken immediately or at earliest practical opportunity? Yes x No ____

   b. Is remedial action taken only at periodic prescheduled or programmed times and conditions? Yes ____ No x

   c. For best performance record which of above appears better:

      immediate or early action? x

      as scheduled only? ________

   d. Must permission for minor maintenace be obtained from some higher out-of-plant authority? Yes ____ No x

   e. Is maintenance referred to above allowed and encouraged? Yes x No ____.

   f. In periodic surveillance tests, simulated alert standby tests, etc., is the criteria "pass/not pass" the test used? Yes x No ____ Per Technical specifications

   g. Is there a conscious continuing policy to detect and remedy marginal conditions or imminent trouble: for examples: lube oil pressure shutdown only two to five psi below operating pressure or, perhaps overspeed governor setting only one or two percent above starting speed surge or etc.? Yes x No ____

   h. Are efforts to remedy marginal or questionable conditions as mentioned above encouraged by plant management? ______

      Yes x No ______

   i. Are remedial steps on items similar to the above taken or allowed when the unit has started and operated satisfactorily within specified limits or conditions? Yes x No ______

O. Starting Conditions

1. Give starting or necessary cranking time as experienced.

   a. Starting time per specification 10 seconds from start signal to breaker closure.
   b. Usual starting time ~9.5 seconds
   c. Maximum starting time observed ~9.95 seconds

2. Give usual time intervals as follows:

   a. Time from start-to-crank to first firing of any cylinder. ∿4 seconds

   b. Time from start-to-crank to approximate full firing of all cylinders. ∿7 seconds

3. Give maximum speed surge when starting; use both tachometer and frequency meter if possible.

   a. Usual conditions UN rpm
      61.3 Hz
   b. Maximum observed UN rpm
      61.5 Hz

4. During a surveillance test, give time from start-to-crank to when steady synchronous speed is attained and maintained.

   a. Usual 9-9.5 seconds
   b. Maximum 10 seconds
   c. As specified 10 seconds.

5. Give briefly the most troublesome problems in starting.

   a. Most troublesome Turbocharger problems during start.

   b. Next to most troublesome N/A

P. <u>Air Cleaner or Air Filter - Combustion Air</u>

1. Combustion air source: taken from engine room or inside the building, or from outdoors?

   a. Indoors x
   b. Outdoors ______

2. Give type and make of air cleaners or air filters:

   a. Oil bath ________ Make ________
   b. Oil wetted screen ________ Make ________
   c. Paper #250 Make Stewart-Stevenson
   d. Other ________ Make ________
   e. Precleaner: Yes ____ No ____

3. Excessive air flow restriction and servicing need determined by?

   a. Instrument such as:

      manometer ________
      If other give type ________
   b. Personal judgement by appearance, etc. √
   c. By smoking exhaust ________
   d. Time schedule every 3 years
   e. Other (Specify) ________

4. Are climatic extremes normally experienced such as:

   a. Air heavily loaded with water mist, high humidity and low temperature? Yes ____ No ____ (no / no / yes)
   b. Blowing sand and dust? Yes x No ____ sometimes
   c. Blowing snow (blizzards)? Yes ____ No x
   d. Other-Name ________

5. Are climatic extremes potentially possible such as:

   a. Air heavily loaded with water mist, high humidity and low temperature? Yes ____ No ____ (no / yes / yes)
   b. Blowing sand and dust? Yes x No ____
   c. Blowing snow (blizzards)? Yes ____ No x
   d. Other-Name ________

Q. Temperature Conditions

1. Ambient outside hottest 100 °F. rarely

2. Ambient outside coldest 30 °F. 2-3 times per year

3. Engine-generator room hottest UN °F.

4. Engine-generator room coldest 30 °F. 2-3 times per year

5. Inside switch gear hottest UN

R. Operator Qualifications (as presently exists, and suggested minimums if different)

1. Minimum education required (check)

	Existing	Suggested
a. High School	x	
b. Trade School		
c. Technical School		
d. No minimum		

2. Minimum Years of operating experience (diesel electric generator)

	Existing	Suggested
a. 0-3	x	
b. 3-6		
c. 6-10		
d. 10-15		

3. Operator training

	Existing	Suggested
a. Military - sometimes		
b. Industrial - sometimes		
c. On-the-job	x	
d. Combination of a, b, and c (indicate which)		

4. Licensing required

	Existing	Suggested
a. State		
b. Federal	x	
c. Utility or self	x	
d. None		

S. Are any foreign gases such as propane, freon, halon, carbon dioxide, etc. stored in the: Diesel Engine room? Yes ___ No _x_ or adjacent buildings? Yes ___ No _x_

If yes, (other than hand portable fire extinguishers), then identify gases and give approximate tank size.

Gases ________ Volume (ft^3) ________

T. Does control system automatically bypass, in emergency starting, any engine temporarily out of service for maintenance? Yes ___ No _x_

If yes, then how many failures to bypass have occured?

____

U. Does the control system automatically override the test mode under emergency conditions? Yes _x_ No ___

V. Have repetitive mechanical failures occurred in any component part or subsystem of the engine, generator, or switch gear, etc.? Yes _x_ No ___

If yes, then which part or subsystem? Turbo-charger; loss of lubrication to bearings and gears.

How many failures? 5 (1 pre-op testing; 4 since license) Note: There are 4 turbo-chargers per unit

Give nature of failure. On D/G start, electric oil pump stopped (by design) at 200 rpm, but main oil pump had not developed pressure. Design change implemented 3/78 to preclude recurrence. Re: Reportable Occurance 335-77-42, followup report #1, of 5/15/78

W. Would periodic (yearly or other) evaluation and/or testing by "outside experts" contribute significantly to the diesel-generator reliability? Yes ___ No _x_

Give brief reasons for the answer. We have sufficient knowledge available on site or within company. Vendor examination of turbo-chargers has confirmed in-house evaluation alluded to in V. above.

X. 1. Give the accumulated time-load operating record for each diesel-generator unit from installation to the present (Running Hours):

Preoperational test Date 8-75

Engine Serial No.	Surv. Testing & Maintenance Hrs. No Load	Surv. Testing & Maintenance Hrs. Loaded	Emergency and Other Service Hrs.	Total Hours
1A	~10	~161	~ 15	186
1B	~ 10	~124	~ 15	149

NOTE: Total Hours were read off "hour meter". Remaining numbers are rough estimates.

2. Surveillance test load (percent of continuous rating) ~~30% before~~ 1-78 95-100% after 1-78

3. Give the projected or planned time-load operation for each diesel-generator unit during the next 12 months.

Surveillance & Maintenance Hrs.	Emergency and other Service Hrs.	Total Hours	
~36	0	~36	

4. Provide the following summary of the periodic surveillance testing experience:

a. Starting date of surveillance testing (OL date) 3-1-76
b. Periodic test interval monthly; plus every 8 hrs. if other diesel out-of servi
c. Total number of surveillance tests performed ~80*
d. Total number of test failures 6; most recent was 8 mos. ago.

failure to start 4 (2 op. error) failure to accept load 1- would not reach full load due to turbo-charger problem
started & ran & then turbo-charger failed failure to carry load 1 failures due to operator error 2
failure due to equipment not being operative during emergency conditions 0

e. Supply a copy of the surveillance test procedures with this completed questionnaire.

* Since OL, ~200 starts

Additional Comments

Y. General Suggestions

Briefly give constructive criticism or suggestions as to improvement in reliability of the diesel generators. These remarks may cover tests, maintenance, practices, orders, policy, adjustments, etc.