

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)  
DISTRIBUTION FOR INCOMING MATERIAL 50-220

REC: GOLLER K R  
NRC

ORG: DISE D P  
NIAGARA MOHAWK PWR

DOC DATE: 01/20/78  
DATE RCVD: 01/26/78

DOCTYPE: LETTER NOTARIZED: NO

COPIES RECEIVED

SUBJECT:

LTR 1 ENCL 1

FORWARDING PARTIAL RESPONSE TO NRC'S 12/15/77 REQUEST FOR INFO CONCERNING THE EMERGENCY DIESEL GENERATORS AT SUBJECT FACILITY... AND ADVISING A COMPLETED QUESTIONNAIRE WILL BE SUPPLIED BY 02/20/78.

PLANT NAME: NINE MILE PT - UNIT 1

REVIEWER INITIAL: XJM  
DISTRIBUTOR INITIAL:

\*\*\*\*\* DISTRIBUTION OF THIS MATERIAL IS AS FOLLOWS \*\*\*\*\*

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

FOR ACTION: BRANCH CHIEF LEAR\*\*W/<sup>3</sup> ENCL

INTERNAL:

REG FILE\*\*W/ENCL  
~~I&E\*\*W/ENCL~~ W/2 ENCL  
HANAUER\*\*W/ENCL  
~~XXXXXXXXXX~~  
~~XXXXXXXXXX~~  
~~XXXXXXXXXX~~  
~~XXXXXXXXXX~~

NRC PDR\*\*W/ENCL  
OELD\*\*W/ENCL  
~~XXXXXXXXXX~~  
~~XXXXXXXXXX~~  
J. COLLINS\*\*W/ENCL  
F. CLEMENSON\*\*W/ENCL

EXTERNAL:

LPDR'S  
OSWEGO, NY\*\*W/ENCL  
TIC\*\*W/ENCL  
NSIC\*\*W/ENCL  
ACRS CAT B\*\*W/<sup>10</sup> ENCL

DISTRIBUTION: LTR <sup>25</sup>~~40~~ ENCL <sup>25</sup>~~30~~  
SIZE: 1P+22P

CONTROL NBR: 780270036

\*\*\*\*\* THE END \*\*\*\*\*

*mar*

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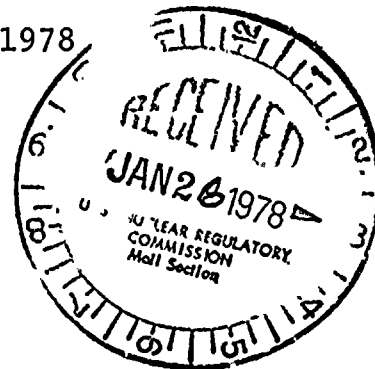
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Donald P. Dise  
Vice President  
Engineering

NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

January 20, 1978



Director of Nuclear Reactor Regulation  
Attn: Mr. Karl R. Goller  
Assistant Director of Operating Reactors  
Division of Operating Reactors  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Re: Nine Mile Point Unit 1  
Docket No. 50-220  
DPR-63

Gentlemen:

Your letter of December 15, 1977 requested information concerning the emergency diesel generators at Nine Mile Point Unit 1. It was requested that available information be supplied by January 20, 1978.

At the present time, only a partial response to your request can be made. A partially-completed questionnaire is attached.

A completed questionnaire will be supplied by February 20, 1978.

Very truly yours,

NIAGARA MOHAWK POWER CORPORATION

*Donald P. Dise*

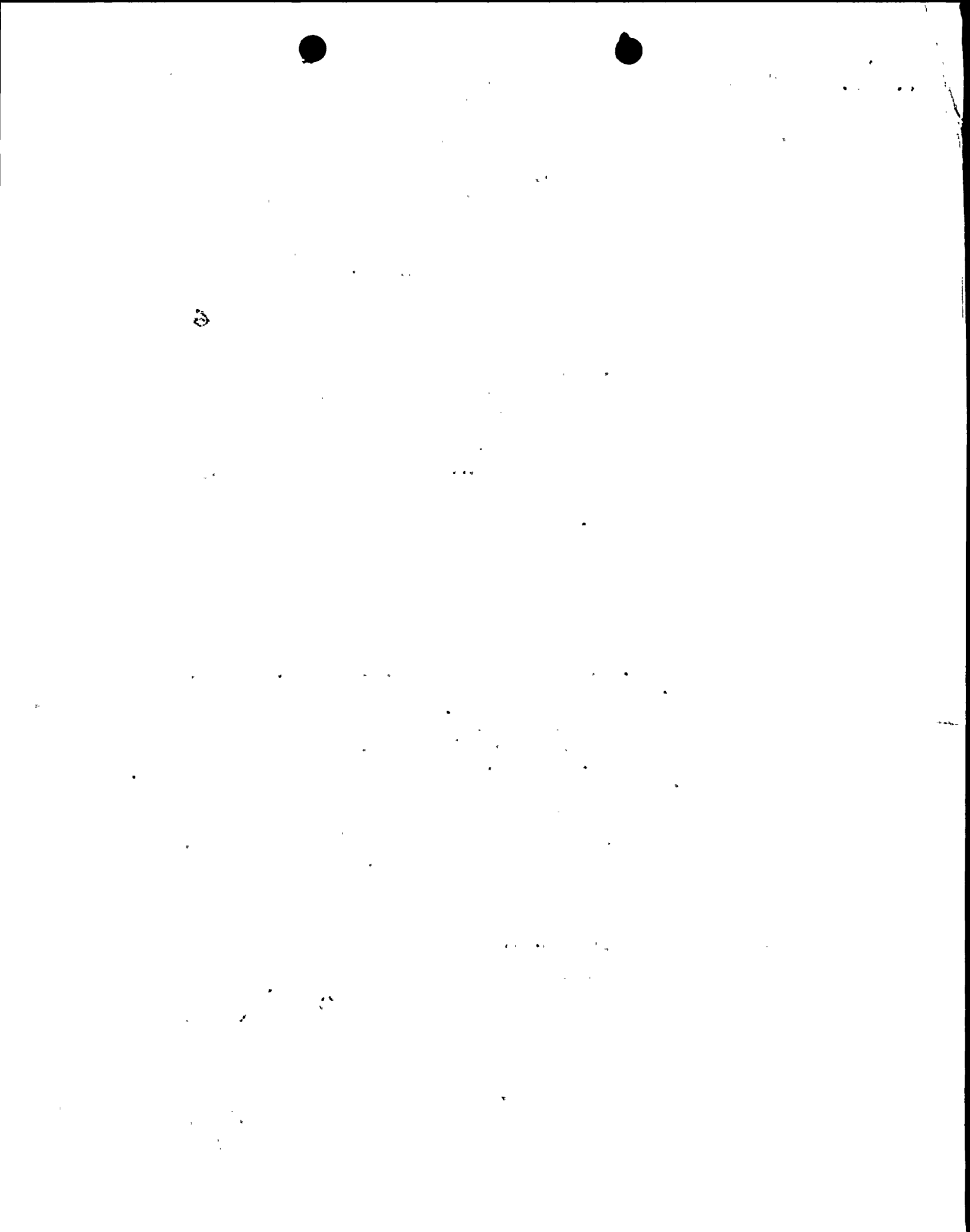
Donald P. Dise  
Vice President-Engineering

780270036

MGM/szd

Attachment

A014/5  
1/1



Questionnaire

for

NUCLEAR REGULATORY COMMISSION  
RELIABILITY STUDY

of

Standby Diesel Generator Units

Date Questionnaire Completed: \_\_\_\_\_

Plant Name: Nine Mile Point Unit No. 1

Diesel Manufacturer: Electro-Motive Model: 20-645-E4

Number of Units: 2

Size Kw/Unit: 2560 KW @ .8 PF Rated Speed: 900 RPM

Average Operating Hours Per Unit to Date: 510 hours

DIESEL GENERATOR STATUS

A. Engine:

1. Problems are caused chiefly by (give estimated number)
  - a. Defective parts X (10)
  - 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 Rand Model No. D89RH-46  
Electric cranking motor \_\_\_\_\_ Mfr. \_\_\_\_\_ Model No. \_\_\_\_\_



2. If air cranking, then:

Give size of starting air tank: Length 84" Diameter 24"

Normal standby air tank pressure 220 psi.

Is pressure reducer used? Yes X No     

Reducer pipe size? 1.5 inches.

Starting air control admission valve pipe size in air piping system, 1.5 inches.

Minimum air tank pressure for engine cranking 175 psi.

Number of five-second cranking periods between above pressures with no tank recharging 5.

Number of air tanks per engine 5.

Can starting air tanks serve more than one engine?

Yes      No X

Is air pipe to engine from top of air tank? Yes X No     

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\*

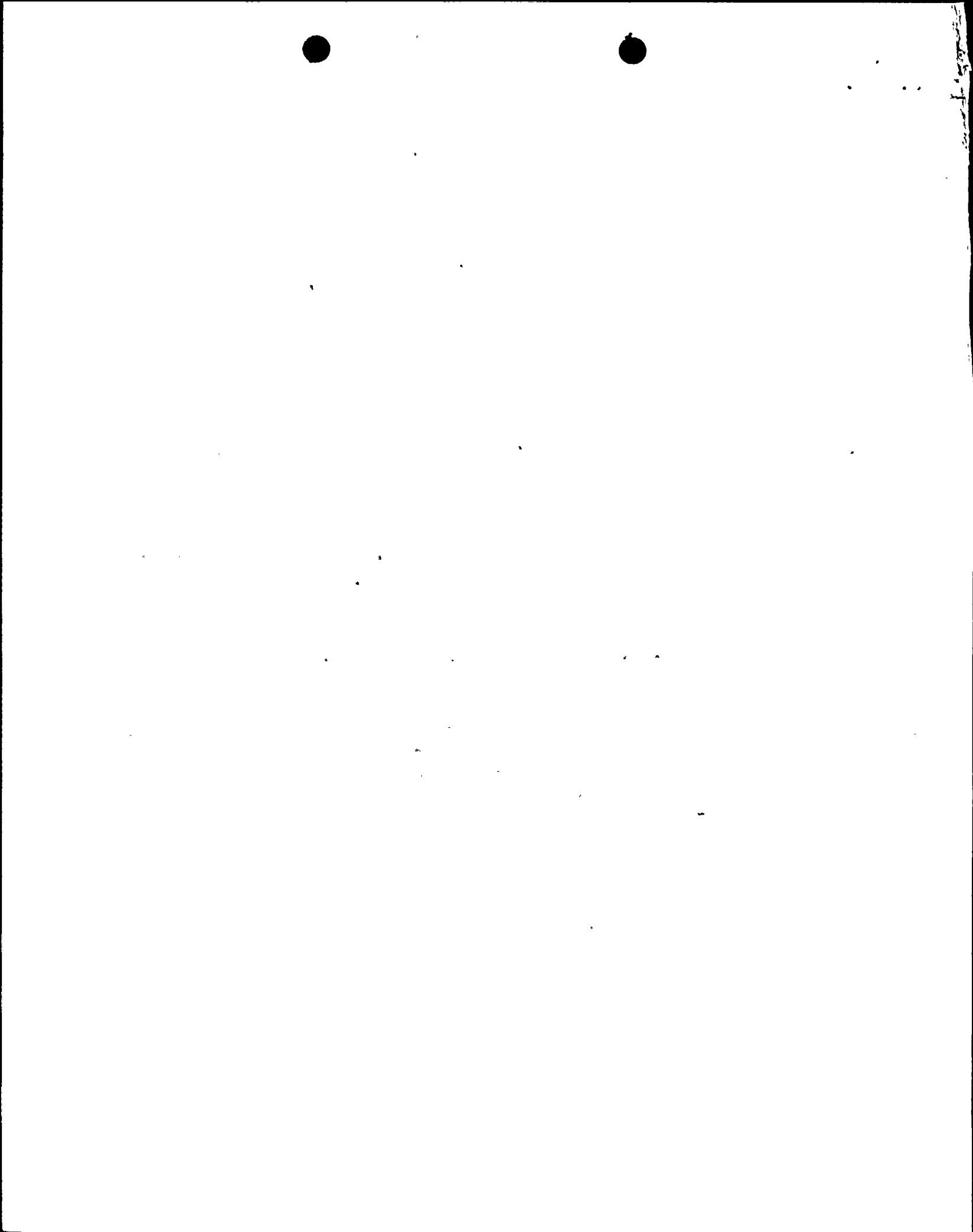
If water condensate drains are provided, then is draining:

a. Automatic through float valve? Yes      No X

b. Manual by hand valve? Yes X No     

c. If manual, then is draining water condensate done:

\*Drops vertically 3' to air starting motors.





daily? \_\_\_\_\_  
weekly? X  
monthly? \_\_\_\_\_  
before each start if manual? \_\_\_\_\_  
no procedure? \_\_\_\_\_

Is dirt and rust filter provided in starting air pipe?  
Yes X No \_\_\_\_\_

If provided, where installed? At the suction end of the air  
motors.

How is it cleaned? Air blow off

How often and when? Upon routine check

Give pipe size of filter: 1.5 inches.

How is it known whether filter is plugged or has high pressure drop? low air pressure to starting motors.

Is starting air pipe to engine positioned:

- a. Below floor? \_\_\_\_\_
- b. On the floor? \_\_\_\_\_
- c. Overhead? X

What is air pressure drop from air tank to engine during cranking 15 psi

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

- a. Nearest engine 30 feet
- b. Furthest engine 30 feet



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Diameter of starting air pipe from:

- a. Air tank to starting valve 1.5 inches
- b. At air starting valve 1.5 inches
- c. At engine 1.5 inches

What is the primary source of power for the starting air system? 600 volt A.C. supply to motor driven comp.

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

What is the time required to recharge one air tank?  
less than 30 minutes

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

If yes, then by:

- a. Gasoline engine?
- b. Motor driven?
- c. Other? (Specify)

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)



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C. Fuel Oil System: 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  No

Does this system have a hand-operated emergency fuel pump? Yes  No

If yes, is this hand-operated pump and piping in immediate operating condition? Yes  No

2. Is there a water and sediment drain from the very bottom of the:
- a. Bulk tank? Yes  No
- b. Day tank? Yes  No

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

a. Bulk tank? Yes  No

b. Day or integral tank? Yes  No

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

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  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?
- b. Hot?  (above 130°F)



What is fuel oil return line size (nominal)?

- a. Pipe size .75 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
- b. Engine driven pump X
- 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      No X

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

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

9. Approximate bulk tank capacity, 10,000 gallons.

10. Typical frequency of refilling (weekly, monthly, etc.) twice/year

11. Typical refill (gallons), 4000 approximately

D. Lube Oil System

1. Lube oil

- a. Type Mobil Guard 440
- b. Viscosity SAE 40
- c. Specification number ASTM-1000
- d. Oil change determined by:

Time interval: Yes      No X  
Give interval N.A. monthly, yearly  
By oil analysis: Yes X No



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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   X

4. Oil Pressure Monitoring

- a. Normal operating pressure   55   psi
- b. Alarm   43   psi
- c. Shutdown   17   psi

5. Oil temperature control:

- a. By standby heater in engine sump   120   °F.
- b. Heating means for maintaining standby temperature:

Direct in oil                     
Oil-to-water heat exchanger   X    
Other (Specify)                                   

E. Cooling System - Engine Water

1. Temperature control by:

- a. By thermostat in water? Yes   X   No

.If yes, then:

Bypass thermostat? Yes   X   No         
Throttle thermostat? Yes        No



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b. By radiator shutter: N.A.

Automatic \_\_\_\_\_

Manual \_\_\_\_\_

Other (give type) \_\_\_\_\_

2. Corrosion control (water additive)? Yes X No \_\_\_\_\_

If yes, give chemical additive or name of compound.

Sodium Chromate (Na<sub>2</sub> Cr O<sub>4</sub>)

Proportion or concentration control:

a. By additive measurement? Yes \_\_\_\_\_ No X

b. By water coolant analysis? Yes X No \_\_\_\_\_

3. Engine cooling water cooled by:

a. Radiator? No

b. Heat exchanger from sea, river or other water? X

c. Other? (give type) \_\_\_\_\_

4. Engine cooling water temperature-monitoring

a. Standby temperature 120 °F

b. Normal operating temperature 155 °F

c. Alarm temperature 195 °F

d. Shutdown temperature N.A. °F

e. Water circulation during standby:

Thermo-syphon X

Pump \_\_\_\_\_

5. Water Pressure Monitoring: Yes X No \_\_\_\_\_

a. Alarm N.A.

b. Shutdown 35 psig falling

c. Both \_\_\_\_\_



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6. Water temperature Sensor Position:

- a. In piping from engine \_\_\_\_\_
- b. In engine piping X
- 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 X No \_\_\_\_\_
- c. Both of above? Yes X No \_\_\_\_\_
- d. Is bottom of surge tank above top of engine system? Yes X No \_\_\_\_\_
- 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, 1 inches.
- g. Manual air bleed only? Yes \_\_\_\_\_ No X

F. Governor - Speed Control

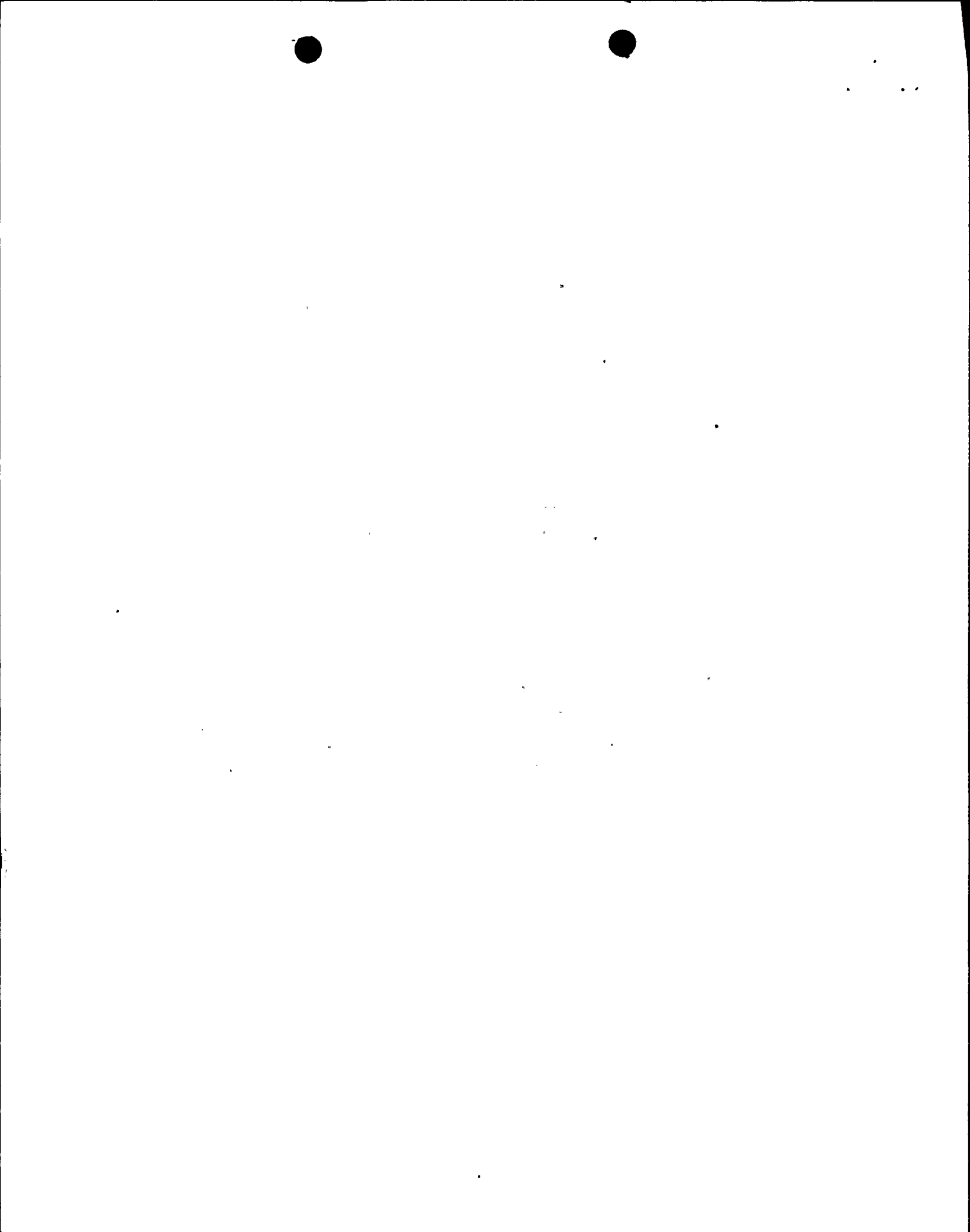
Manufacturer Woodward  
Electric (speed sensing) \_\_\_\_\_  
Hydraulic X  
Type or code (such as EGB-35, LSG-10, etc.) UG8  
Automatic load sharing? Yes X No \_\_\_\_\_

1. Is compensation or stability control and/or speed of response manually adjustable? Yes X No \_\_\_\_\_

If yes, adjusted by:

- a. Eye and ear?
- b. Test and specification? X
- c. Other? (Specify) \_\_\_\_\_

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



Is the engine stopped:

a. Manually? Yes \_\_\_ No X\*

If yes, then:

Directly at engine? Yes \_\_\_ No \_\_\_  
Through local control panel? Yes \_\_\_ No \_\_\_

b. Automatically through the controls in the control room? Yes X No \_\_\_

c. By setting governor to "fuel-off" position? Yes \_\_\_ No X

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

e. Other means. Describe briefly. \_\_\_\_\_

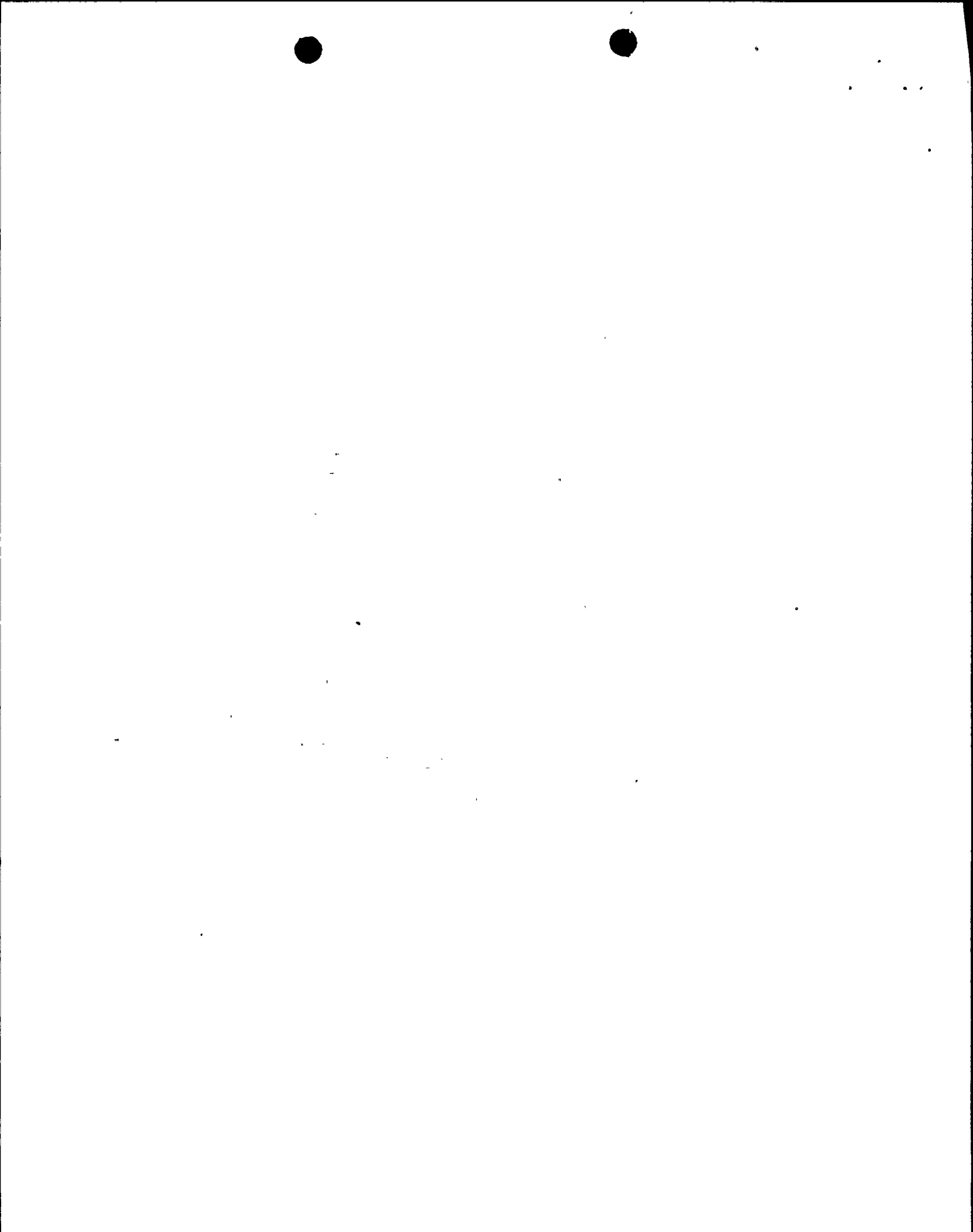
3. When engine is stopped, is fuel control in:

- a. Full fuel or maximum fuel position? Yes
- b. Full off or no fuel position? No
- c. Intermediate? No
- d. Random? No

(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, 10 seconds.

\*Normally it started and stopped from the Control Room.





G. Governor - Overspeed (shutdown)

1. Speed sensing?

- a. Electrical \_\_\_\_\_
- b. Flyball X
- c. Other (Specify) \_\_\_\_\_

2. Fuel shutoff force generated by:

- a. Spring? X
- b. Air? \_\_\_\_\_
- c. Hydraulic? \_\_\_\_\_
- d. Electrical? X
- e. Other? (Specify) \_\_\_\_\_

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

- a. 115% \_\_\_\_\_
- b. 110% \_\_\_\_\_
- c. Other (Specify) 118%

4. Is overspeed tripping set point tested periodically?

Yes X No \_\_\_\_\_

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

H. 1. Generator Mfr. Electro Motive Model No. A-20-C1  
Single bearing or two bearings? Single Bearing  
Does generator have damper windings? Yes X No \_\_\_\_\_

2. Does generator have any obvious fault or difficulty?  
Yes \_\_\_\_\_ No X

Is problem repetitive? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, then describe briefly. \_\_\_\_\_



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I. Exciter and Voltage Regulator

1. Exciter Manufacturer: Vickers Model \_\_\_\_\_

Type: Rotating \_\_\_\_\_ Static X

If rotating drive? Direct \_\_\_\_\_  
Belt or Chain \_\_\_\_\_  
DC with field control \_\_\_\_\_  
Brushless with rectifier \_\_\_\_\_

2. Voltage Regulator: Manufacturer Vickers Model 35D870-2

Type: Mechanical \_\_\_\_\_ Static X

3. Are paralleled units of automatic load sharing control of fully automatic type? Yes \_\_\_\_\_ No X  
We do not parallel the diesel generators  
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 \_\_\_\_\_ No X

If yes, by means of what tests and what standards? Give name or very brief description. \_\_\_\_\_

5. If any difficulties have occurred, give approximate number of problems. No Difficulties

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



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J. Paralleling: Engine-Generator Units

1. Do all units consistently have the proper voltage output?  
Yes X No \_\_\_\_\_
2. Do all units automatically share both the "real" or in-phase load and also the reactive load reasonably well? Yes X 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 X No \_\_\_\_\_

If no, approximate percent difference. \_\_\_\_\_

4. Synchronizing

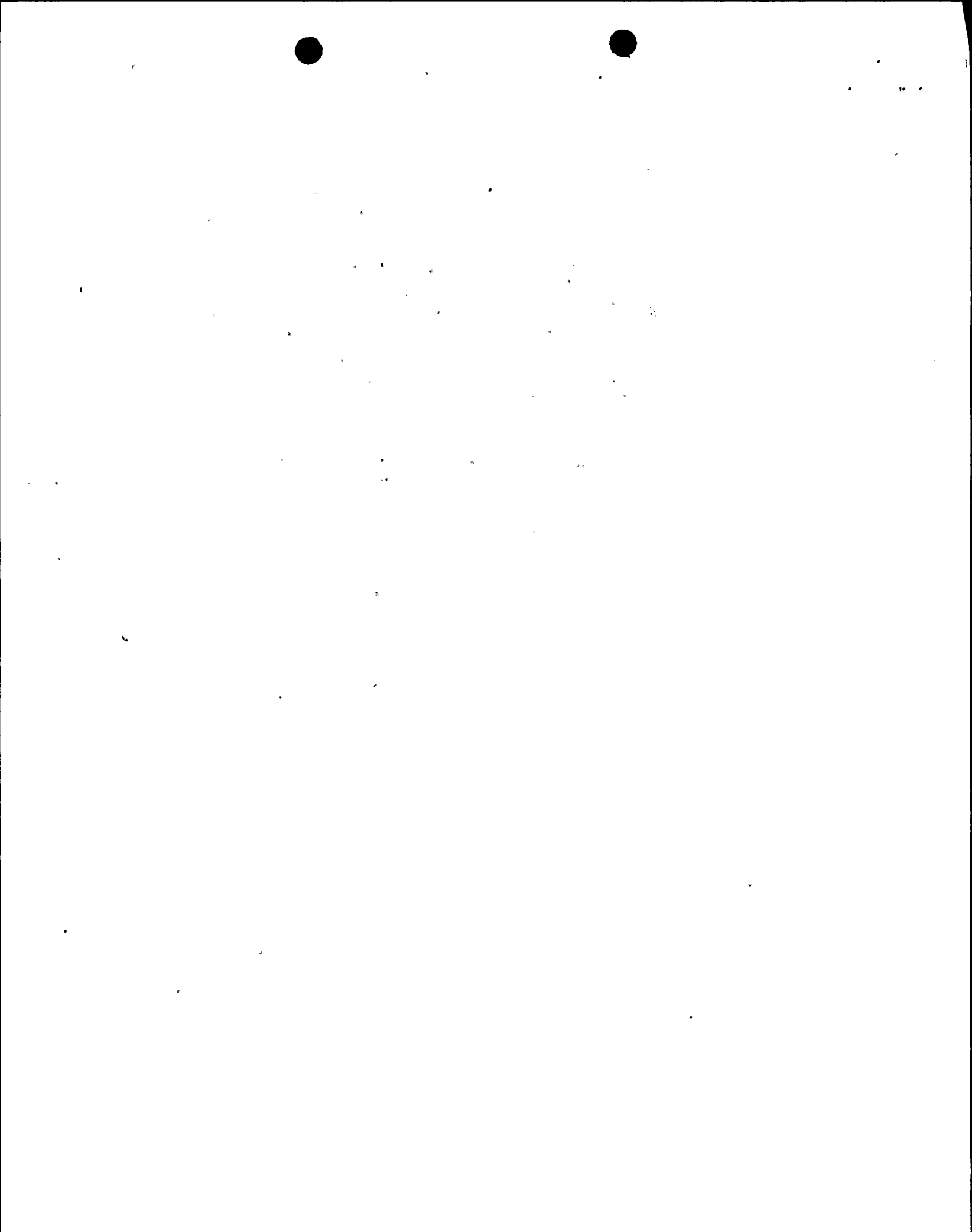
- a. In automatic synchronizing do circuit breakers close immediately after reaching full synchronous speed?  
Automatic synchronizing Yes \_\_\_\_\_ No \_\_\_\_\_  
NOT USED.
- b. If "no" above then, does speed of some units drift slowly while failing to synchronize and close circuit breakers?

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. No Difficulties
  - a. Components \_\_\_\_\_
  - 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. Two 125 V.D.C. station batteries

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   
station

L. Safety Shut downs

Give safety shut down settings compared to equilibrium operating conditions.

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

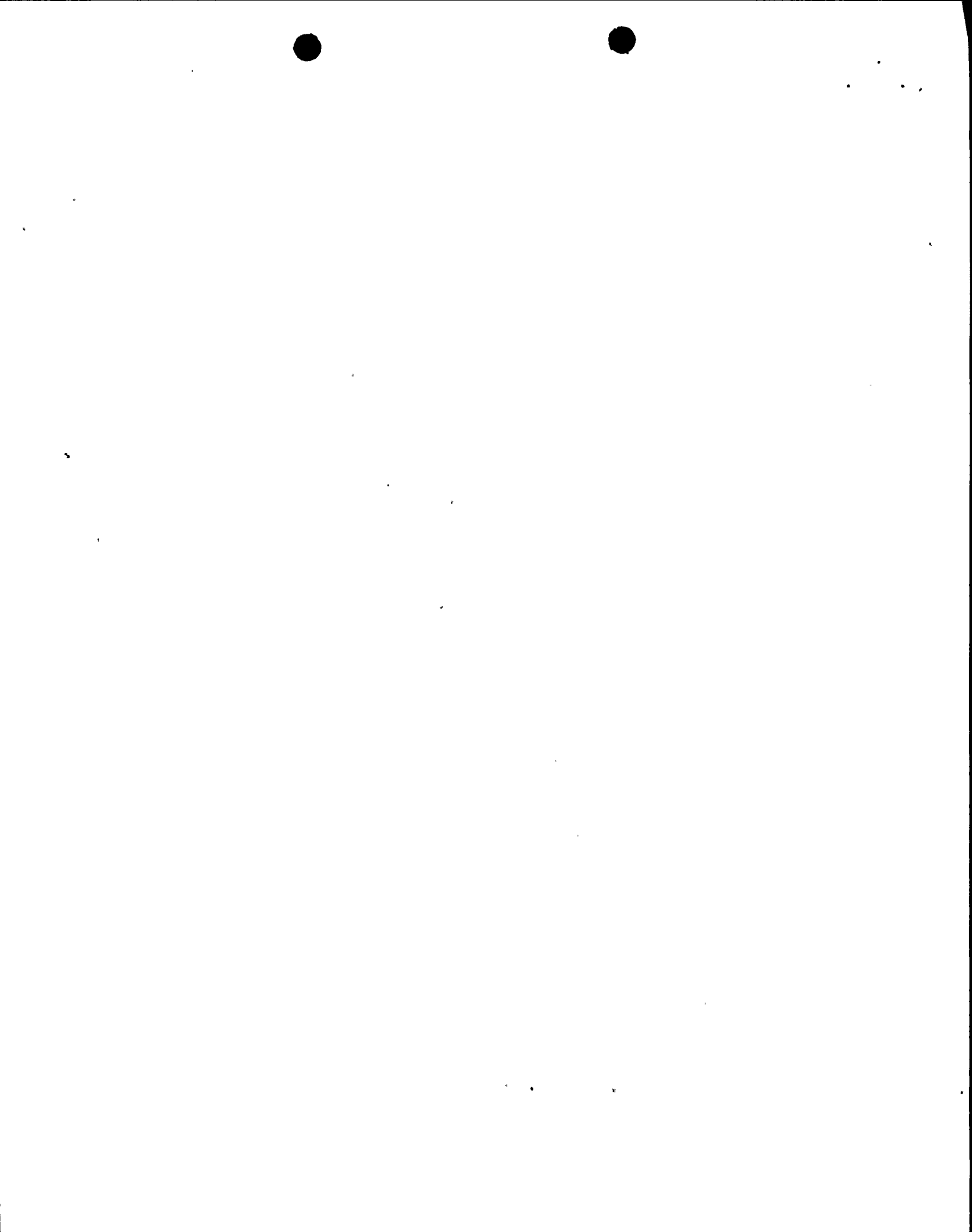
- a. Synchronous and usual 900 rpm or 60 Hz
- b. Overspeed shutdown setting 990 rpm or          Hz

2. Engine cooling water (see E.4)

- a. Equilibrium 155 °F
- b. Alarm 195 °F
- c. Shut down No Trip °F

3. Lube oil pressure (see D.4)

- a. Equilibrium 55 psi
- b. Alarm 43 psi
- c. Shut down 17 psi





4. Lube oil temperature

- a. Equilibrium 150 °F
- b. Alarm 52 °F
- c. Shutdown No Trip °F

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

- a. Usual or proper condition Low water pressure  
switch, closes 45 psig rising pressure, generator  
lock relay.
- b. Shutdown condition opens 35 psig. Falling  
pressure, generator lockout relay operated.

6. a. What source of power is provided to operate alarms and shutdown controls? (See G.2) 125 V.D.C.

- b. Do the generator units automatically shutdown in case of the electrical power loss to its control system? Yes X No

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.

low water pressure switch, bearing oil pressure switch,  
overspeed switch. Note these are bypassed for two minutes  
under emergency conditions. Also generator lockout relay is bypassed

- 3. For each interlock not bypassed is coincident logic only when there is low voltage on the bus. used? Yes      No X

If yes, is it testable? Yes      No     

N. Maintenance

- 1. Does plant have regularly scheduled maintenance procedures? Yes

If so, return copy of these procedures with questionnaire.  
Request procedure NI-PM-C6 from Nine Mile Point Plant.



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 maintenance 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     

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     

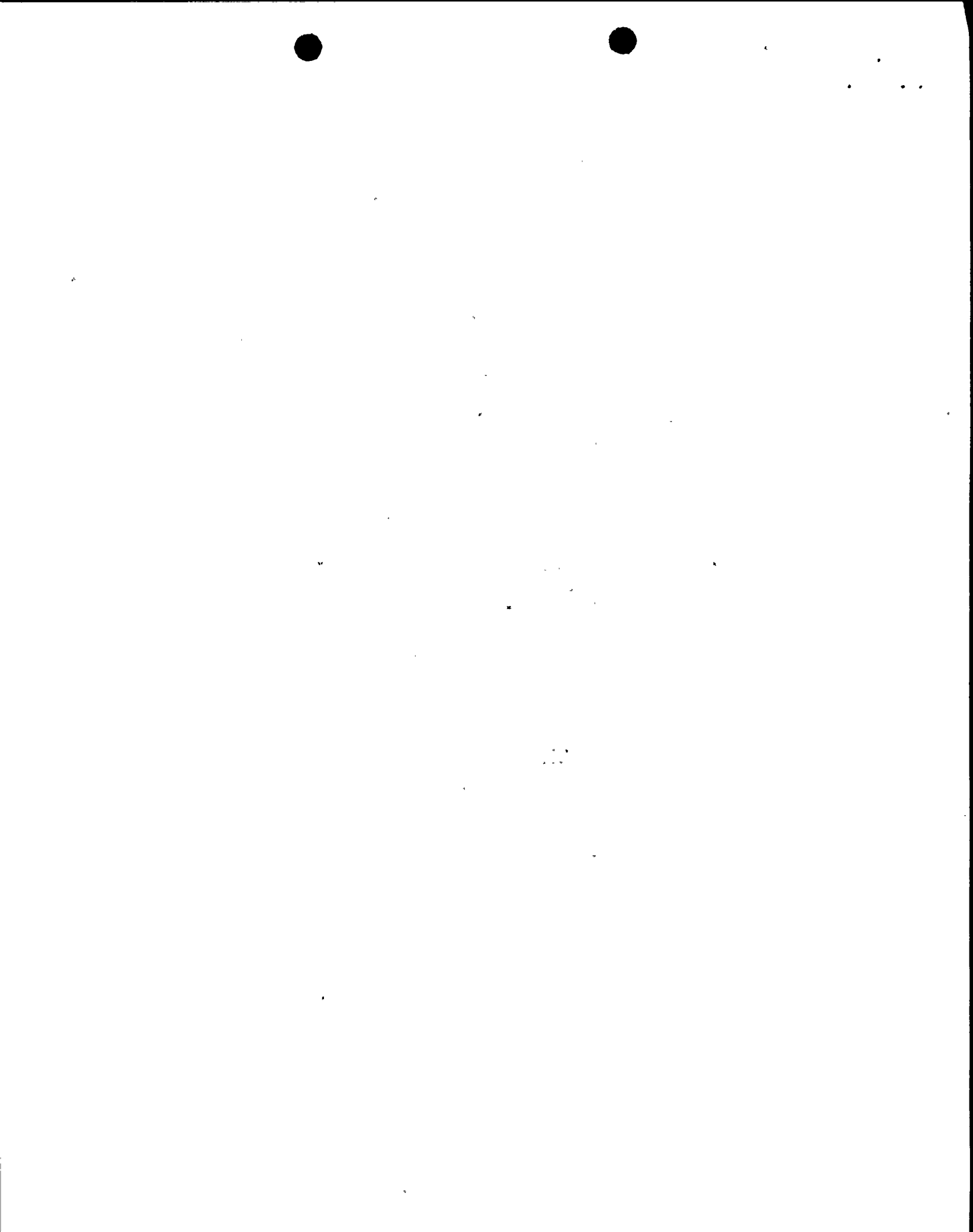
h. Are efforts to remedy marginal or questionable conditions as mentioned above encouraged by plant management?       
Yes X No     

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     

0. Starting Conditions

1. Give starting or necessary cranking time as experienced.

- a. Starting time per specification     10 seconds
- b. Usual starting time     5 seconds
- c. Maximum starting time observed     8 seconds







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

- a. Oil bath  Make Electro Motive
- b. Oil wetted screen \_\_\_\_\_ Make \_\_\_\_\_
- c. Paper \_\_\_\_\_ Make \_\_\_\_\_
- 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 \_\_\_\_\_
- e. Other (Specify) \_\_\_\_\_

4. Are climatic extremes normally experienced such as:

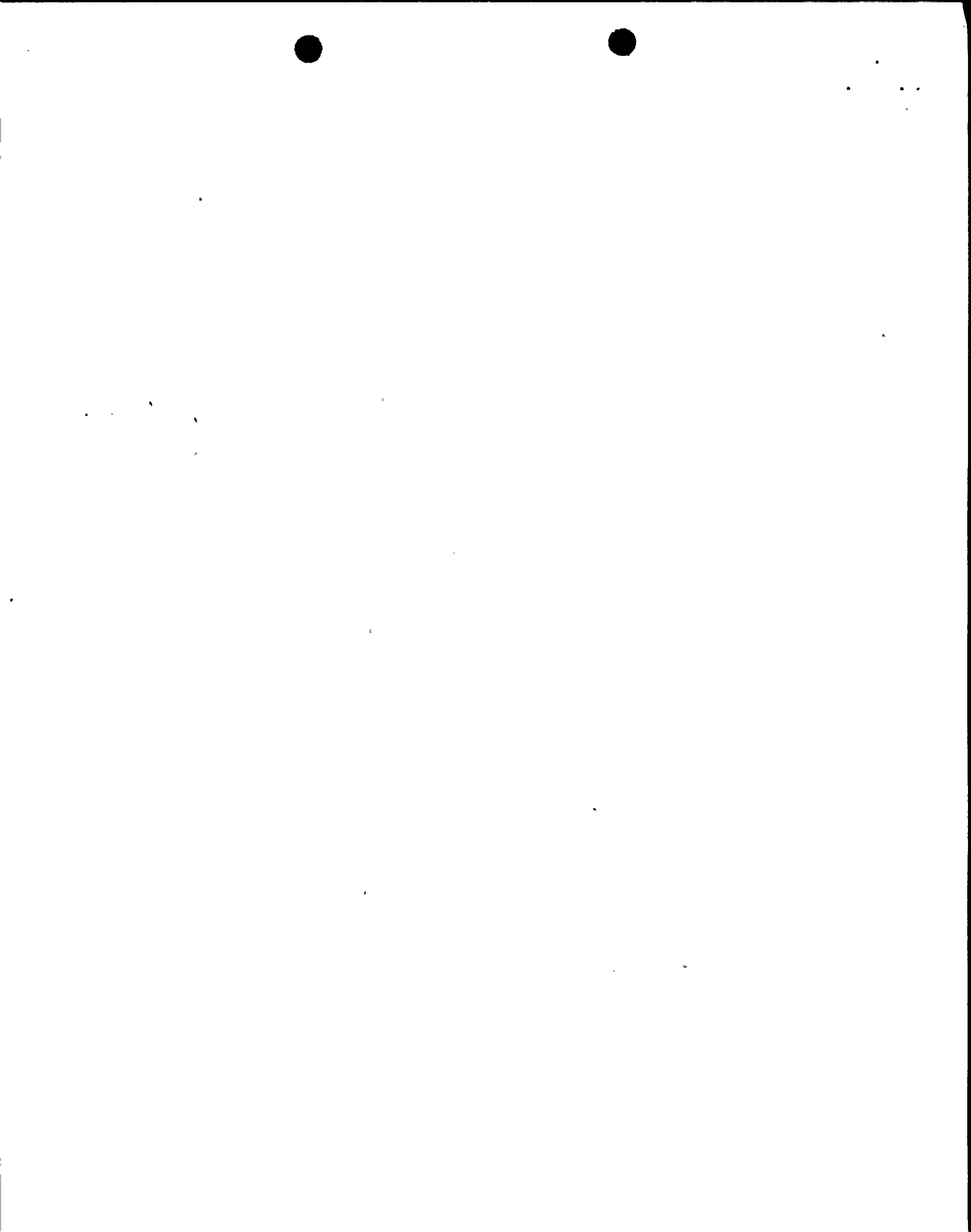
- a. Air heavily loaded with water mist, high humidity and low temperature? Yes \_\_\_\_\_ No
- b. Blowing sand and dust? Yes \_\_\_\_\_ No
- c. Blowing snow (blizzards)? Yes  No \_\_\_\_\_
- d. Other-Name \_\_\_\_\_

5. Are climatic extremes potentially possible such as:

- a. Air heavily loaded with water mist, high humidity and low temperature? Yes \_\_\_\_\_ No
- b. Blowing sand and dust? Yes \_\_\_\_\_ No
- c. Blowing snow (blizzards)? Yes  No \_\_\_\_\_
- d. Other-Name \_\_\_\_\_

Q. Temperature Conditions

- 1. Ambient outside hottest 100 °F.
- 2. Ambient outside coldest -30 °F.
- 3. Engine-generator room hottest 100 °F.
- 4. Engine-generator room coldest 50 °F.
- 5. Inside switch gear hottest 100
- 6. Inside voltage regulator or ambient near voltage regulator hottest 100 °F
- 7. Ambient at exciter hottest 100 °F





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

1. Minimum education required (check)

	<u>Existing</u>	<u>Suggested</u>
a. High School	_____	_____
b. Trade School	_____	_____
c. Technical School	_____	_____
d. No minimum	_____	_____

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

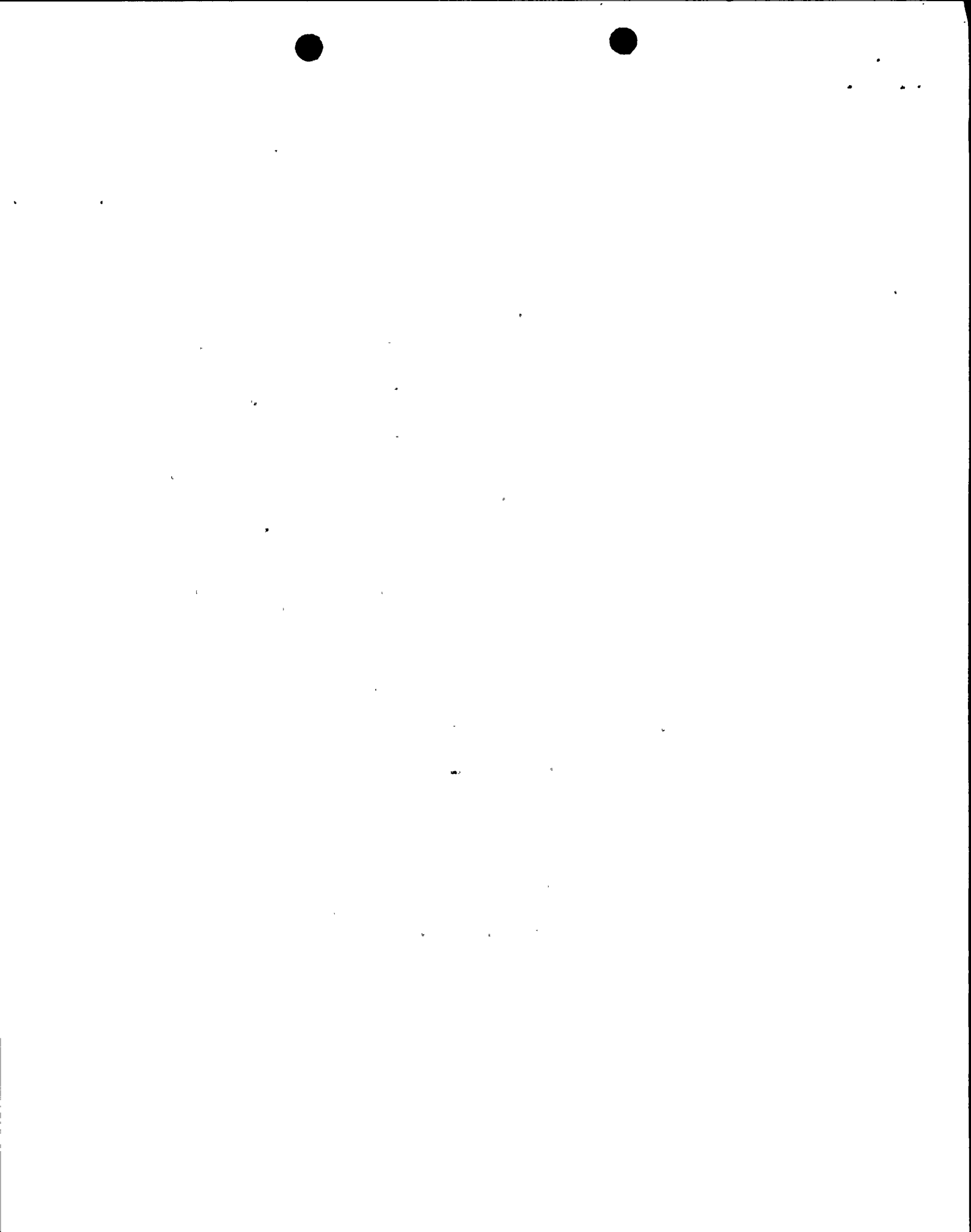
	<u>Existing</u>	<u>Suggested</u>
a. 0-3	_____	_____
b. 3-6	_____	_____
c. 6-10	_____	_____
d. 10-15	_____	_____

3. Operator training

	<u>Existing</u>	<u>Suggested</u>
a. Military	_____	_____
b. Industrial	_____	_____
c. On-the-job	_____	_____
d. Combination of a, b, and c (indicate which)	_____	_____

4. Licensing required

	<u>Existing</u>	<u>Suggested</u>
a. State	_____	_____
b. Federal	_____	_____
c. Utility or self	_____	_____
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 <sup>3</sup> ) _____
_____	_____
_____	_____
_____	_____
_____	_____

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 occurred?  
\_\_\_\_\_

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 \_\_\_\_\_ No X

If yes, then which part or subsystem? \_\_\_\_\_

How many failures? \_\_\_\_\_

Give nature of failure. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

Give brief reasons for the answer. The vendor serviceman is more likely to spot developing troubles. He also has knowledge of current unit problems on similar units.  
\_\_\_\_\_  
\_\_\_\_\_



1 1 1

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

Preoperational test Date \_\_\_\_\_

: Engine	: Surv. Testing &	: Emergency	: Total
: Serial No.	: Maintenance Hrs.	: and Other	: Hours
:	: No Load : Loaded	: Service Hrs.	:
:	:	:	:
:	:	:	:
:	:	:	:
:	:	:	:
:	:	:	:
:	:	:	:
:	:	:	:
:	:	:	:
:	:	:	:

2. Surveillance test load (percent of continuous rating) \_\_\_\_\_

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

: Surveillance &	: Emergency	: Total
: Maintenance Hrs.	: and other	: Hours
:	: Service Hrs.	:
:	:	:
:	:	:
:	:	:
:	:	:

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

- a. Starting date of surveillance testing (OL date) \_\_\_\_\_
- b. Periodic test interval \_\_\_\_\_
- c. Total number of surveillance tests performed \_\_\_\_\_
- d. Total number of test failures \_\_\_\_\_

failure to start \_\_\_\_\_ failure to accept load \_\_\_\_\_  
failure to carry load \_\_\_\_\_ failures due to operator error \_\_\_\_\_  
failure due to equipment not being operative during emergency conditions \_\_\_\_\_

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



Additional Comments

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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.

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CONTROL CHECK

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