Stat (2)

FEB 12 1996

ENGINEERING DATA TRANSMITTAL

1. EDT No. 612070

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
Characterization Plant Engineering	Characterization Equipment Improvement	N/A
5. Proj./Prog./Dept./Div.:	6. Cog. Engr.:	7. Purchase Order No.:
Core Sampling Aux. Equipment	J.L. Smalley	404886
8. Originator Remarks: ETN-94-0023-D This Acceptance Test Report is transmitted for approval. The report documents compliance with specification WHC-S-0252 Rev.0.		9. Equip./Component No.: N/A
		10. System/Bldg./Facility: 200 General
11. Receiver Remarks:		12. Major Assm. Dwg. No.: N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: 5/12/95

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-WM-ATR-105	N/A	0	Diesel Generator Acceptance Test Report	Q	1	1	\

16. KEY

Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)	1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)

(G) Reason	(H) Disp.	(J) Name (K) Signature (L) Date (M) MSIN	(J) Name (K) Signature (L) Date (M) MSIN	(G) Reason	(H) Disp.
1		~~DES~~ ~~Cog.~~ Eng. ~~J.L. Smalley~~ JLS 2/6/96	Alois Kostelnik 6-14-95 57-12	1	1
1		~~DES~~ ~~Cog.~~ Mgr. ~~R.J. Blanchard~~ RJB 2/6/96	D.W Hamilton 2/6/96 57-12	1	1
1	1	QA J.J. Verderber M.L. McElroy M.L. McElroy 57-07			
		Safety N/A			
		Env. N/A			
1	1	Core Sampling Cog. ~~A.P. Mousel~~ JJS for 57-12			
1	1	Core Sampling Cog Mgr. JS Schofield 6/14/95 57-12			

18.	19.	20.	21. DOE APPROVAL (if required) Ctrl. No.
AJ Kostelnik AJK 5-8-95	TD Jaeckl ~~AP Mousel~~ 6/13/95	JS Schofield ~~RJ Blanchard~~ 6/14/95	☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments
Signature of EDT Originator / Date	Authorized Representative for Receiving Organization / Date	Cognizant Manager / Date	

BD-7400-172-2 (04/94) GEF097

DIESEL GENERATOR ACCEPTANCE TEST REPORT

ALOIS J. KOSTELNIK
WESTINGHOUSE HANFORD COMPANY, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

EDT/ECN: 612070 UC: 2070
Org Code: 75230 Charge Code: N4H2B
B&R Code: EW3120074 Total Pages: 45

Key Words: ETN-94-0023-D, Core Sampling, Diesel Generator, Specification WHC-S-0252, Cummins, Onan, 150KW Generator, Purchase Order 404866, Core Sampling Ancillary Equipment

Abstract: This Acceptance Test Report documents compliance with the requirements of specification WHC-S-0252. The equipment was tested according to WHC-SD-WM-ATP-105 Rev.0.

Release Approval 1/16/96 Date

Release Stamp

Approved for Public Release

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APPENDIX B (ATP results for Genset SN F940547197) Page B1

APPENDIX C (NEC Inspection Results) Page C1

APPENDIX D (Receipt Inspection Report) Page D1

SUMMARY

The test was performed at Cummins Northwest's facility in Renton, WA. All steps and exceptions were completed at the time of testing. The NEC Inspection discovered items that needed repair which were verified upon receipt inspection.

One item which was not written as an exception is the 88 decibel noise recording for the generator sets. The Gensets were parked on an asphalt drive, next to a shop area for access to fuel, tools and test equipment during the test. The control station for the generator was between the generator and the shop wall. If the noise meter was moved to either side of the control panel the noise level dropped indicating that the cinder block shop wall was reflecting the noise back at the Genset and influencing the noise measurement. After considering the test conditions and the fact that the Gensets will be used in the field, parked on sand, the 88 decibel noise level was judged as acceptable without retesting.

The attached Appendix A contains the Acceptance Test Results for Genset Model # 150DGFA, Serial # E940542240. Appendix B contains the Acceptance Test Results for Genset Model # 150DGFA, Serial # F940547197. Appendix C contains the Internal Memo from Electrical Power Systems Engineering which includes the NEC Inspection results for both Gensets. Appendix D includes the Receipt Inspection Report for both Gensets.

STA 4
SEP 23 1994

ENGINEERING DATA TRANSMITT

608068

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
Core Sampling	Characterization Equipment	N/A
5. Proj./Prog./Dept./Div.:	**6. Cog. Engr.:**	**7. Purchase Order No.:**
Core Sampling Aux. Equipment	J.L. Smalley	404886
8. Originator Remarks:		**9. Equip./Component No.:**
ETN-94-0023-D This Acceptance Test Procedure is transmitted for approval. The procedure was prepared by the Seller and will be performed at the Sellers location. It will show compliance with specification WHC-S-0252 Rev. 0.1 ajk 9-7-94		N/A
		10. System/Bldg./Facility: 200 General
11. Receiver Remarks:		**12. Major Assm. Dwg. No.:** N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: 9/15/94

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-WM-ATP-105	N/A	0	Diesel Generator Trailer Acceptance Test Procedure	Q	1	1	1

16. KEY

Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.
1	/	Cog.Eng. J.L. Smalley		9/23/94	R1-17	OSTI (2)			L8-07	3	
1	/	Cog. Mgr. R.J. Blanchard		9/23/94	R1-17						
1	/	QA J.J. Vero		9-22-94	S1-57						
		Safety N/A									
		Env. N/A									
1	/	Core Sampling Cog. A.P. Mousel		9/22/94	S7-12						
3		Central Files			L8-04						

18.	19.	20.	21. DOE APPROVAL (if required) Ctrl. No.
AJ Kostelnik Signature of EDT Originator — Date: 9-7-94	AP Mousel See Block 17 ajk 9-22-94 Authorized Representative for Receiving Organization — Date	RJ Blanchard Cognizant Manager — Date: 9/23/94	☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments

RELEASE AUTHORIZATION

Document Number:	WHC-SD-WM-ATP-105, REV 0
Document Title:	Diesel Generator Trailer Acceptance Test Procedure
Release Date:	9/23/94

* * * * * * * * * * * * * *

This document was reviewed following the procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

* * * * * * * * * * * * * *

WHC Information Release Administration Specialist:

Kara Broz
(Signature)

9/23/94
(Date)

SUPPORTING DOCUMENT

2. Title	3. Number	4. Key No.
Diesel Generator Trailer Acceptance Test Procedure	WHC-SD-WM-ATP-105	0

5. Key Words

ETN-94-0023-D
Core Sampling, Diesel Generator, Specification WHC-S-0252, Trailer, Cummins, Onan, 150KW Generator, Purchase Order 404886, Core Sampling Auxiliary Equipment

6. Author

Name: Alois J Kostelnik

Signature

Organization/Charge Code 7EA40/

KMB 9/23/94 APPROVED FOR PUBLIC RELEASE

7. Abstract

This Acceptance Test Procedure (ATP) will document compliance with the requirements of WHC-S-0252 Rev.1 and ECNs 609271, and 609272. The equipment being tested is a 150KW Diesel Generator mounted on a trailer with switchgear. The unit was purchased as a Design and Fabrication procurement activity. The ATP was written by the Seller and will be performed by the Seller with representatives of the Westinghouse Hanford Company witnessing the test at the Seller's location.

8. PURPOSE AND USE OF DOCUMENT - This document was prepared for use within the U.S. Department of Energy and its contractors. It is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. This document is not approved for public release until reviewed.

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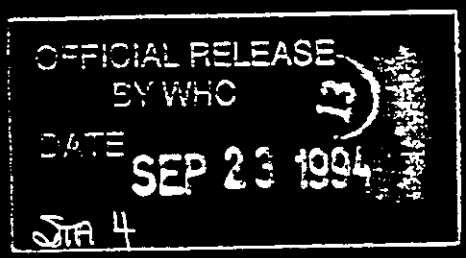
9. Impact Level Q

10. RELEASE STAMP



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1.0 Scope

This acceptance test procedure is to verify that the trailer mounted 150KW Cummins/Onan Diesel Generator Set meets the requirements of Westinghouse Hanford specification WHC-S-0252.

2.0 Test Performance

Cummins Northwest will complete the following test in the order deemed best by Cummins personnel. Westinghouse Hanford Company (WHC) personnel shall witness all testing and shall perform the inspection portion of the test. All steps will be completed and any exceptions shall be noted on the attached exception sheet along with the resolution. Cummins Northwest shall resolve all exceptions with the concurrence of WHC.

3.0 Inspection Plan

3.1 Record the model and serial numbers of the Generator Set and Trailer.

	GENERATOR SET	TRAILER
Model	150DC-FA	1D9115192RS151331 VIN
Serial	E94C542240	

3.2 Verify by record review that the generator is capable of the following:

GJK 3.2.1 3-phase, 4-wire, 277/480 VAC and single-phase 240/120 VAC.

GJK 3.2.2 Operating frequency is 60 Hertz ± 0.5%.

GJK 3.2.3 Standby Rating Range is 150KW @ 0.8 power factor.

GJK 3.2.4 Prime Rating Range is 135KW @ 0.8 power factor.

GJK 3.2.5 Voltage dip does not exceed 20% of rated voltage upon application of rated load at rated power factor. Per Gen Size 2 printout GJK

GJK 3.2.6 Voltage regulation under load from no load to 100% load is within ± 2% of rated voltage, (±10 V).

GJK 3.2.7 Frequency regulation under varying loads from no load to 100% load is within ± 3 Hz.

3.3 Verify the control panel contains the following:

3.3.1 **Run-Off-Auto** switch: (**Run**: manually start engine) (**Off**: stop engine) (**Auto**: start engine by closing of a remote contact) Run-off- Remote

3.3.2 Accessible remote start-stop terminals.

3.4 Verify controls are provided to shutdown and lock out the engine under the following abnormal operating conditions:

3.4.1 Engine failure to start after a specified cranking time.

3.4.2 Engine over-speed.

3.4.3 Engine low lube oil pressure.

3.4.4 Engine high operating temperature.

3.4.5 Remote manual stop activated.

3.5 Verify the following instrumentation is provided as a minimum:

3.5.1 Engine lube oil pressure gauge.

3.5.2 Coolant temperature gauge.

3.5.3 Hour meter.

3.5.4 Battery volt meter.

3.5.5 Fuel gauge for day tank.

3.5.6 Cranking time meter (Internal timer, alarm light indicator) 3.4.1 Duplicate aJK

3.5.7 Other instruments normally provided by the manufacturer for the proper operation and maintenance of their engine-generator set. Pre High Engine Temperature Pre Low Oil Pressure

3.6 Verify battery-powered visual and audible alarms for the following condition as a minimum are provided. Verify alarm test switch, lamp test switch and alarm reset switch and contacts for each alarm for remote signaling are provided: No audible alarm. aJK

3.6.1 Over-crank shutdown.

3.6.2 High engine temperature shutdown.

3.6.3 Low engine lube oil pressure shutdown.

3.6.4 Over-speed of engine shutdown.

3.7 Verify the generator AC power output monitoring and controls include the following as a minimum:

GJK 3.7.1 AC voltmeter with a phase selector switch with an OFF position.

GJK 3.7.2 AC ammeter with a phase selector switch with an OFF position.

GJK 3.7.3 Frequency meter.

GJK 3.7.4 AC voltage adjust rheostat.

GJK 3.7.5 Generator output circuit breaker with manual reset.

3.8 Verify the following equipment has been installed:

GJK 3.8.1 The basic trailer is provided with an electrical equipment rack located on the ~~side~~ Rear of the engine-generator set enclosure that does not increase the total width dimension of the unit. The equipment rack is located for easy access but allows accessibility to the engine-generator set for maintenance and operation. All receptacles are on the same side of the generator and labels are mechanically fastened to the equipment with screws.

GJK 3.8.2 The distribution and wiring system have been installed per NFPA 70, National Electrical Code. See Exception

GJK 3.8.3 There is a 25KVA transformer on the unit to provide single phase power of 240/120 volt. The transformer has fault protection on the primary side.

GJK 3.8.4 A 100KW load bank is on the unit. The load bank is divided into 3 sections, 2 (two) 25KW and 1 (one) 50KW sections, which may be manually switched on individually as required to maintain the generator near 70% of capacity. The load bank is wired for operation in parallel with the normal load.

3.8.5 The electrical equipment furnished by the engine-generator set Supplier, mounted on the equipment rack outside of the engine-generator set enclosure, and wired to the generator output terminals via a 3-phase, 4-wire bus is as follows: (Rated current capacity of components shall not be less than the rating requested.)

C/K 3.8.5.1 One (1), 3-pole, 3-wire, 150 amp rated, 80 amp trip, 600 VAC, lockable circuit breaker. A 100 amp. receptacle is on the load side of the circuit breaker and is labeled as **"SERVICE TRAILER 240 VAC 80 AMPS"**. The receptacle is an Appleton Cat. # ADR1034.

C/K 3.8.5.2 One (1), 3-pole, 3-wire, 150 amp rated, 50 amp trip, 600 VAC, time delay lockable circuit breaker. A 60 amp. receptacle is on load side of the circuit breaker and is labeled as **"BREATHING AIR COMPRESSOR 480 VAC 50 AMPS"**. The receptacle is an Appleton Cat. # ADR6034.

C/K 3.8.5.3 One (1), 3-pole, 3-wire, 200 amp rated, 110 amp trip, 600 VAC, lockable circuit breaker. A 200 amp. receptacle to the load side of the circuit breaker and label receptacle as **"UTILITY 480 VAC 110 AMPS"**. The receptacle is an Appleton Cat. # ~~ADR20044.~~ AR20044 ADR not available. C/K

C/K 3.8.5.4 One (1), 20 amp, 240 VAC, single receptacle, wired from a two pole, 20 amp breaker to be used for hookup of temporary power boxes. Labeled as **"240 VAC 20 AMPS"**.

C/K 3.8.5.5 One (1), 20 amp, 120 VAC, duplex receptacle, wired from a single pole, 20 amp breaker with ground fault protection, to be used for hookup of temporary tools and lighting. Labeled as **"120 VAC 20 AMPS"**.

C/K 3.8.5.6 One (1), 30 amp, 120 VAC, single receptacle, wired from a single pole, 30 amp breaker. Labeled as **"PURGE GAS TRAILER 120 VAC 30 AMPS"**.

____ 3.8.6 The unit has grounding rods and a 100 foot cable to allow grounding to a ground grid. To be verified at receipt Inspection. C/K

#4 Copper minimum C/K

3.9 Verify the following engine-generator trailer requirements are satisfied:

3.9.1 The engine-generator set including all accessories are mounted on a heavy duty type trailer designed for use in construction, communications, and utility applications.

3.9.2 The trailer meets Department of Transportation (DOT) requirements for highway travel. (DOT Certification)

3.9.3 Vibration isolators are used between the engine-generator set and the ~~trailer.~~ frame

3.9.4 The trailer is equipped with running lights, brake lights, safety brake, stabilizer jack on each corner; a front wheel jack with wheel; and hitches.

3.9.5 The trailer has a 2 3/4 inch Lunette hitch with vertical adjustment.

3.9.6 The underside of the trailer is undercoated for rust protection.

3.9.7 The trailer has hydraulic surge type brakes.

3.9.8 The generator is within an enclosure and the enclosure is lined with sound deadening material.

3.9.9 The instruments and controls are vibration isolated to prevent gauge and control malfunction.

3.10 Verify the following engine requirements are satisfied:

GAK 3.10.1 Diesel fuel engine.

GAK 3.10.2 Engine shall be electric start from negative grounded battery supplied.

GAK 3.10.3 Battery shall be charged with alternator having automatic voltage regulation supplied with engine.

GAK 3.10.4 A fuel tank is on the unit that will supply fuel for the engine to operate at full load for at least 24 hours. (Capacity 250 gal, Consumption rate 9.7 gal/hr)

GAK 3.10.5 Two (2) stage dry type air cleaner with a restriction gauge.

GAK 3.10.6 Furnished with the capability for cold weather starting such as electric glow plugs. Engine hot start 1500 watt, 110 volt heater.

GAK 3.10.7 Record the freeze point of the engine antifreeze. (-40 °F)

GAK 3.10.8 Drip pan to catch fuel or oil leaks.

GAK 3.10.9 Painted inside and out. Exterior is White.

GAK 3.10.10 Verify there are no Suspect Fasteners as identified on the U.S. Custom's Fasteners Headmark List.

GAK 3.10.11 Verify all visible welds are acceptable per AWS D1.1.

4.0 Run Test

4.1 No Load Cold start: Verify that the engine starts and comes to 1800 ±9 rpm in the specified time. (MFR 0 - 15 sec.)

GAK 4.1.1 Switch Run-Off-Auto switch to Run.
(Time from close of contacts to 1800 rpm 4 sec.)

4.1.2 Verify the following instrumentation is functional and the value indicated is within the range specified by the manufacturer:

GAK 4.1.2.1 Engine lube oil pressure gauge.
(100 psi, MFR 15 - 25 psi) Cold oil OK

GAK 4.1.2.2 Coolant temperature gauge.
(≤100 °F, MFR 60 - 230 °F)

C/K 4.1.2.3 Hour meter. (1.4 hrs)

C/K 4.1.2.4 Battery volt meter. (24 volts, MFR 24 - 30 volts)

C/K 4.1.2.5 Fuel gauge for day tank. (Empty level)

N/A 4.1.2.6 Other instruments normally provided by the manufacturer for the proper operation and maintenance of their particular engine-generator set.

C/K 4.1.3 Record and with a sound meter the generator noise level at the electrical control panel and verify that it is less than 85 decibels. 88 decibels. Lot of trapped noise at test site C/K

4.2 Loaded Cold start with Remote/Auto start: Verify, with the 100 KW load bank on line, that the engine starts, comes to 1800 ±9 rpm, and the load is automatically switched on-line in the specified time. (MFR C - 10 sec.)

C/K 4.2.1 Switch Run-Off-Auto switch to Auto.

C/K 4.2.2 Close contacts on a temporarily installed switch. (Time from close of contacts to load on-line. 2 sec.)

C/K 4.2.3 Switch Run-Off-Auto switch to Off. (Remove temporary switch.)

4.3 Verify controls shutdown and lock out the engine under the following simulated abnormal operating conditions. (Temporarily install contacts and jumpers as required to simulate conditions. Restart the generator between each alarm test.) Verify alarm test switch, lamp test switch and alarm reset switch are operational:

C/K 4.3.1 Engine failure to start after a specified cranking time, with alarm. — 3 cycles, 17 sec. on 17 sec rest

C/K 4.3.2 Engine over-speed, with ~~alarm~~ light. 2140 rpm set Factory Test

C/K 4.3.3 Engine low lube oil pressure, with ~~alarm~~ light. or Pre Low Oil Pressure

C/K 4.3.4 Engine high operating temperature, with ~~alarm~~ light. or Pre High Engine Temp

C/K 4.3.5 Remote manual stop activated. ~~(Located on distribution panel).~~ Temporary Switch

4.4 Verify proper operation of the generator, power distribution components and load bank according to the manufacturer's supplied information. (For load bank test operate for 15 minutes at each step prior to recording information.)

4.4.1 Step 1 (25KW Resistive Load for 15 min.)

GJK 4.4.1.1 Amperage 1 130, 2 130, 3 130 amps

GJK 4.4.1.2 Voltage 1-2 483, 2-3 484, 1-3 483

GJK 4.4.1.3 Frequency 62.1 Hz

GJK 4.4.1.4 Oil Pressure 80 psi

GJK 4.4.1.5 Water Temperature 125 °F

4.4.2 Step 2 (50KW Resistive Load for 15 min.)

GJK 4.4.2.1 Amperage 1 59, 2 59, 3 60 amps

GJK 4.4.2.2 Voltage 1-2 483, 2-3 483, 1-3 483

GJK 4.4.2.3 Frequency 61.8 Hz

GJK 4.4.2.4 Oil Pressure 75 psi

GJK 4.4.2.5 Water Temperature 170 °F

4.4.3 Step 3 (100KW Resistive Load for 15 min.)

GJK 4.4.3.1 Amperage 1 120, 2 120, 3 120 amps

GJK 4.4.3.2 Voltage 1-2 483, 2-3 483, 1-3 483

GJK 4.4.3.3 Frequency 61.1 Hz

GJK 4.4.3.4 Oil Pressure 65 psi

GJK 4.4.3.5 Water Temperature 175 °F

4.4.4 Verify voltage and clockwise phase rotation as noted for the following:

GJK 4.4.4.1 **UTILITY 480 VAC 110 AMPS** outlet

4.4.4.1.1 Phase rotation CW

4.4.4.1.2 Voltage 1-2 483, 2-3 483, 1-3 483

GJK 4.4.4.2 **SERVICE TRAILER 240 VAC 80 AMPS** outlet

4.4.4.2.1 Voltage 1-2 240

GJK 4.4.4.3 **BREATHING AIR COMPRESSOR 480 VAC 50 AMPS** outlet

4.4.4.3.1 Phase rotation CW

4.4.4.3.2 Voltage 1-2 483, 2-3 483, 1-3 483

GJK 4.4.4.4 **240 VAC 20 Amp** Single Receptacle

4.4.4.4.1 Voltage 240

GJK 4.4.4.5 **120 VAC 20 Amp** Duplex Receptacle

4.4.4.5.1 Voltage 120

GJK 4.4.4.6 **PURGE GAS TRAILER 120 VAC 30 Amp** Single Receptacle

4.4.4.6.1 Voltage 120

GJK 4.4.5 Switch **Run-Off-Auto** switch to **Off**.

4.5 No load hot start: Verify that the engine starts and comes to 1800 rpm in the specified time. (MFR C - 10 sec.)

GJK 4.5.1 Switch **Run-Off-Auto** switch to **Run**. Time 2 sec.

GJK 4.5.2 Switch **Run-Off-Auto** switch to **Off**.

4.6 Loaded hot start: Verify, with the 100 KW load bank on line, that the engine starts, comes to 1800 ±9 rpm, and the load is automatically switched on-line in the specified time. (MFR C - 10 sec.)

GJK 4.6.1 Switch **Run-Off-Auto** switch to **Run**.
(Time from close of contacts to load on-line. 2 sec.)

GJK 4.6.2 Switch **Run-Off-Auto** switch **Off**.

TEST EXCEPTIONS

Step #	Description of exception and resolution.
3.8.2	Grounding ① Generator Frame should be bonded to the trailer Frame ② provide chase through circuit breaker Enclosure (Mounted on the Rear of Trailer) for Grounding Electrode connection to neutral / Ground Bus. G/K Verify upon receipt inspection. G/K
3.2.2	Frequency for full load factory set @ 60 Hz. Test data shows variance which is explained by lack of full load during test. Trend of frequency indicates equipment is capable. G/K

TEST COMPLETED BY:

PRINT NAME	COMPANY	SIGNATURE	DATE
Alois J Kostelnik	WHC	Alois J Kostelnik	9-26-94
CUMMINS NORTHWEST INC		Charles D Schultz	9-26-94

* Make additional copies as required.

SUSPECT FASTENER HEADMARK LIST

Westinghouse Hanford Company

Help Stamp Out Suspects/Counterfeits

Suspect Fastener Headmark List

All Grade 5 and Grade 8 fasteners of foreign origin which do not bear any manufacturers' headmarks:

 Grade 5

 Grade 8

Grade 5 fasteners with the following Manufacturers' headmarks:

Mark	Manufacturer	Mark	Manufacturer
J	Jinn Her (TW)	KS	Kosaka Kogyo (JP)

Grade 8 fasteners with the following Manufacturers' headmarks:

Mark	Manufacturer	Mark	Manufacturer
A	Asahi Mgf (JP)	KS	Kosaka Kogyo (JP)
NF	Nippon Fasteners (JP)	RT	Takai Ltd (JP)
H	Hinomoto Metal (JP)	FM	Fastener Co. of Japan (JP)
M	Minamida Seybo (JP)	KY	Kyosi Mfg (JP)
MS	Minato Kogyo (JP)	J	Jinn Her (TW)
Hollow Triangle	Intasco (CA, TW, JP, YU)	(Greater than 1/2-inch diameter Grade 8 Hollow Triangle only)	
E	Daisi (JP)	UNY	Unytite (JP)

Grade 8.2 fasteners with the following headmarks:

Mark	Manufacturer
KS	Kosaka Kogyo (JP)

Grade A325 fasteners (Bennett Denver target only) with the following headmarks:

	Mark	Manufacturer
Type 1	A325 KS	Kosaka Kogyo (JP)
Type 2		
Type 3		

Key: CA-Canada, JP-Japan, TW-Taiwan, YU-Yugoslavia

Any bolt on this list should be treated as defective without further testing.

Onan

GENERATOR SET CERTIFICATE OF TEST

Model 150DGFA 68913H		S/N E940542240	
Customer CUMMINS NORTHWEST INC		Order File Number U432913D P.O. 1311R	
SERVICE RATING	X Prime	KW 135	KVA 169
	___ Standby	KW	KVA
FUEL TYPE	___ Gasoline X Diesel ___ LP Vapor ___ LP Liquid ___ Nat Gas ___ Other		
GOVERNOR TYPE	X Mechanical ___ Electrical	Brand BOSCH	
COOLING SYSTEM	X Mounted Radiator ___ Remote Radiator ___ Heat Exchanger	Other	

ITEMS CHECKED/ADJUSTED

X Governor — X Remote Start — X Voltage Regulator
X Oil Pressure Pre-Alarm — X Oil Pressure Shutdown — X Meter Accuracy
X Hi Cool Temp Pre-Alarm — X Hi Cool Temp Shutdown — ___ LET Alarm
X Overspeed 2140 RPM — X Overcrank Sec 17 Crank 17 Rest 87 Total
X Other: List: H389 H462 H480 KH22 K001 B184 F001

TEST CONDITIONS	Test Spec.	Ambient Temp	Barometer	Voltage	Phase	Frequency
	98126	77 Deg F	28.71 In Hg	277/480 V	3	60 Hz

UNIT RESULTS*	Batt Charge Syst 28 X Volts ___ Amps	Voltage 1-2 481	2-3 481	1-3 481
No Load >	Volt Reg Adj 444-510	1-N 278	2-N 278	3-N 278
	Frequency 62.6 HZ	Coolant Temp 175	Lube Press 65	Phase Sequence X UVW ___ Other
Full Load (4 / 4) >	Batt Charge Syst 28 X Volts ___ Amps	Voltage 1-2 480	2-3 480	1-3 480
		1-N 277	2-N 277	3-N 277
	KW 135	Current 1 203	2 201	3 203
	Frequency 60 HZ	Coolant Temp 180	Lube Press 60	Power Factor .8

Maximum Power	Freq	Voltage	ISO Correction Factor	Test Date	Running Time
152	59.5 HZ	480	1.0	05/16/94	1.2

Data Recorded & Certified By: J OLINGER 2947

Quality Engineer: T J McCauley

Date: 5/20/94

X22A041-Front 1/90
19-78

* If unit is dual fuel, see additional sheet for second fuel results.
(See reverse side for extended running time data.)

Mail to: Cummins Northwest
811 S.W. Grady Way
Renton, Wda. 98055
Att: Dot - Schmidt

D. Young 5/31/94

22A054 10/91

ONAN CORPORATION GenSize 2 Version 4.00 Fi

--R U N N I N G------			-----M A X----S U R G E--At Specified Voltage---			
KW	KVA	PF	KW	Occurs in Step	KVA	Occurs in Step
135	135	1.00	135	1	135	1

Recommended GenSet GenSet Voltage: 208-240/416-480
Model: 150DGFA

Nominal KW	Duty	Specified Voltage	Freq.	Specified Alternator	Recommended Alternator
150	Standby	277/480 WYE	60	105	105

When operated at 500 Feet Altitude
and 77 degrees Fahrenheit Ambient the
operating performance is:

* GenSet selected with one GenSet. *

Maximum KW	Voltage Dip	Freq. Dip	Excitation
150	19%	8%	Shunt

Onan Corporation has developed this GenSize 2 computer program to help you, the engineer, with a generator set selection. The recommendations are based upon your input of the genset requirements and typical performance data published by NEMA and other agencies.

Due to changing load and site conditions beyond our control, we cannot be certain the selection of a genset based upon the recommendation of this computer program will meet the site requirements. Therefore, nothing in this program may be construed as a warranty. You must decide for yourself or consult with your local Cummins/Onan distributor that the generator set selected is sufficient for your intended purpose. Each Onan generator set is covered by an express written warranty which is in lieu of all other warranties, expressed or implied.

Please consult with your Cummins/Onan distributor representative in your area for further information.

and engine/alternator capacity.	135 KVA	187	Acceptable
2. Running load requirements and	135 KW	150	Acceptable
alternator capacity at site conditions.	135 KVA	187	Acceptable
3. Max load surge KVA and Max set KVA capacity with minimum 90% sustained voltage.	135 KVA	563	Acceptable
4. Max load Surge KW and Max set Surge KW capacity at site conditions with minimum 90% sustained voltage.	135 KW	189	Acceptable
5. Transient Voltage Dip:	19 %		Acceptable
Allowable Transient Voltage Dip:	35 %		
6. Total non-linear plus linear load KW and Alternator KW capacity.	135 KW	150	Acceptable

ONAN CORPORATION GenSize 2 Version 4.00

Project Name: (WESTINGHOUSE HANFORD)
Project Parameters:

Duty:.....: Stationary Standby
Voltage:.....: 277/480 WYE
Frequency.....: 60
Max. Temp. Rise.....: 105
Max. VDIP%.....: 35
Max. Altitude.....: 500
Altitude Scale.....: Feet
Max. Amb. Temp.....: 77
Temperature Scale.....: Fahrenheit
Cooling System.....: Radiator
Fuel Type.....: Diesel

Load Listing

Load Number: 1 Load Type: Resistive Phase 3

Load Name: (135 KW PRIME) Input KW: 135
Comment:

SKW:	SKVA:	SKVAR:	SPF:	RKW:	RKVA:	RKVAR:	RPF:
135.0	135.0	0	1.00	135.0	135.0	0	1.00

Step Sequence/Load

Step Number: 1 Surge KW: 135 Surge SKVA: 135

Step Name: START 135 KW PRIME LOAD
Comment:

Load #	Qty	SKW	SKVA	SKVAR	SPF	RKW	RKVA	RKVAR	RPF
1	1	135.0	135.0	0	1.00	135.0	135.0	0	1.00
Step Total:		135.0	135.0	0	1.00	135.0	135.0	0	1.00
Cumulative:		135.0	135.0			135.0	135.0	0	

Criteria Selection Results:
Model:150DGFA

	Required by Loads	Available from Model	Result
1. Running load requirements	135 KW	150	Acceptable

STA 4
SEP 23 1994

ENGINEERING DATA TRANSM

608068

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
Core Sampling	Characterization Equipment	N/A
5. Proj./Prog./Dept./Div.:	**6. Cog. Engr.:**	**7. Purchase Order No.:**
Core Sampling Aux. Equipment	J.L. Smalley	404886
8. Originator Remarks:		**9. Equip./Component No.:**
ETN-94-0023-D This Acceptance Test Procedure is transmitted for approval. The procedure was prepared by the Seller and will be performed at the Sellers location. It will show compliance with specification WHC-S-0252 Rev 0.1 AK 9-7-94		N/A
		10. System/Bldg./Facility: 200 General
11. Receiver Remarks:		**12. Major Assm. Dwg. No.:** N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: 9/15/94

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-WM-ATP-105	N/A	0	Diesel Generator Trailer Acceptance Test Procedure	Q	1	1	1

16. KEY

Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.
1	/	Cog.Eng. J.L. Smalley	J.L. Smalley	9/22/94	R1-17	OSTI (2)			L8-07	3	
1	/	Cog. Mgr. R.J. Blanchard	R.J. Blanchard	9/22/94	R1-17						
1	/	QA J.J. Verderber	J.J. Verderber	9-22-94	S1-57						
		Safety N/A									
		Env. N/A									
1	/	Core Sampling Cog. A.P. Mousel	for A.P.M.		S7-12						
3		Central Files			L8-04						

18.	19.	20.	21. DOE APPROVAL (if required) Ctrl. No.
AJ Kostelnik Signature of EDT Originator 9-7-94 Date	AP Mousel See Block 17 Authorized Representative for Receiving Organization 9-22-94 Date	RJ Blanchard Cognizant Manager 9/22/94 Date	☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments

RELEASE AUTHORIZATION

Document Number:	WHC-SD-WM-ATP-105, REV 0
Document Title:	Diesel Generator Trailer Acceptance Test Procedure
Release Date:	9/23/94

* * * * * * * * * * * * * *

This document was reviewed following the procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

* * * * * * * * * * * * * *

WHC Information Release Administration Specialist:

Kara Broz
(Signature)

9/23/94
(Date)

SUPPORTING DOCUMENT

2. Title	3. Number	4. Rev No.
Diesel Generator Trailer Acceptance Test Procedure	WHC-SD-WM-ATP-105	0

5. Key Words

ETN-94-0023-D
Core Sampling, Diesel Generator, Specification WHC-S-0252, Trailer, Cummins, Onan, 150KW Generator, Purchase Order 404886, Core Sampling Auxiliary Equipment

6. Author

Name: Alois J Kostelnik

Signature

Organization/Charge Code 7EA40/

KMB 9/23/94 APPROVED FOR PUBLIC RELEASE

7. Abstract

This Acceptance Test Procedure (ATP) will document compliance with the requirements of WHC-S-0252 Rev.1 and ECNs 609271, and 609272. The equipment being tested is a 150KW Diesel Generator mounted on a trailer with switchgear. The unit was purchased as a Design and Fabrication procurement activity. The ATP was written by the Seller and will be performed by the Seller with representatives of the Westinghouse Hanford Company witnessing the test at the Seller's location.

8. PURPOSE AND USE OF DOCUMENT - This document was prepared for use within the U.S. Department of Energy and its contractors. It is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. This document is not approved for public release until reviewed.

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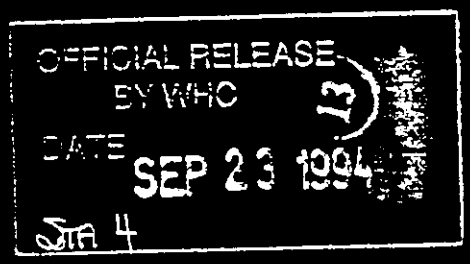
9. Impact Level Q

10. RELEASE STAMP



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1.0 Scope

This acceptance test procedure is to verify that the trailer mounted 150KW Cummins/Onan Diesel Generator Set meets the requirements of Westinghouse Hanford specification WHC-S-0252.

2.0 Test Performance

Cummins Northwest will complete the following test in the order deemed best by Cummins personnel. Westinghouse Hanford Company (WHC) personnel shall witness all testing and shall perform the inspection portion of the test. All steps will be completed and any exceptions shall be noted on the attached exception sheet along with the resolution. Cummins Northwest shall resolve all exceptions with the concurrence of WHC.

3.0 Inspection Plan

3.1 Record the model and serial numbers of the Generator Set and Trailer.

GENERATOR SET	TRAILER
M 150 DGFA 68913H	VIN: 1D9US1923RS
SN: ~~F9~~ F940547197	151338

3.2 Verify by record review that the generator is capable of the following:

GJK 3.2.1 3-phase, 4-wire, 277/480 VAC and single-phase 240/120 VAC.

GJK 3.2.2 Operating frequency is 60 Hertz ± 0.5%. See exception

GJK 3.2.3 Standby Rating Range is 150KW @ 0.8 power factor.

GJK 3.2.4 Prime Rating Range is 135KW @ 0.8 power factor.

GJK 3.2.5 Voltage dip does not exceed 20% of rated voltage upon application of rated load at rated power factor. Per Gen size 2 print

GJK 3.2.6 Voltage regulation under load from no load to 100% load is within ± 2% of rated voltage, (±10 V).

GJK 3.2.7 Frequency regulation under varying loads from no load to 100% load is within ± 3 Hz.

3.3 Verify the control panel contains the following:

GJK 3.3.1 **Run-Off-Auto** switch: (**Run**: manually start engine) (**Off**: stop engine) (**Auto**: start engine by closing of a remote contact) Run Stop Remote

GJK 3.3.2 Accessible remote start-stop terminals.

3.4 Verify controls are provided to shutdown and lock out the engine under the following abnormal operating conditions:

GJK 3.4.1 Engine failure to start after a specified cranking time.

GJK 3.4.2 Engine over-speed.

GJK 3.4.3 Engine low lube oil pressure.

GJK 3.4.4 Engine high operating temperature.

GJK 3.4.5 Remote manual stop activated.

3.5 Verify the following instrumentation is provided as a minimum:

GJK 3.5.1 Engine lube oil pressure gauge.

GJK 3.5.2 Coolant temperature gauge.

GJK 3.5.3 Hour meter.

GJK 3.5.4 Battery volt meter.

GJK 3.5.5 Fuel gauge for day tank.

GJK 3.5.6 Cranking time meter (Internal timer, alarm light indicator) 3.4.1 Duplicate

GJK 3.5.7 Other instruments normally provided by the manufacturer for the proper operation and maintenance of their engine-generator set. Pre High Engine Temperature Pre Low Oil Pressure

3.6 Verify battery-powered visual and audible alarms for the following condition as a minimum are provided. Verify alarm test switch, lamp test switch and alarm reset switch and contacts for each alarm for remote signaling are provided: No audible alarm. GJK

GJK 3.6.1 Over-crank shutdown.

GJK 3.6.2 High engine temperature shutdown.

GJK 3.6.3 Low engine lube oil pressure shutdown.

GJK 3.6.4 Over-speed of engine shutdown.

3.7 Verify the generator AC power output monitoring and controls include the following as a minimum:

3.7.1 AC voltmeter with a phase selector switch with an OFF position.

3.7.2 AC ammeter with a phase selector switch with an OFF position.

3.7.3 Frequency meter.

3.7.4 AC voltage adjust rheostat.

3.7.5 Generator output circuit breaker with manual reset.

3.8 Verify the following equipment has been installed:

3.8.1 The basic trailer is provided with an electrical equipment rack located on the ~~side~~ of the engine-generator set enclosure that does not increase the total width dimension of the unit. The equipment rack is located for easy access but allows accessibility to the engine-generator set for maintenance and operation. All receptacles are on the same side of the generator and labels are mechanically fastened to the equipment with screws.

3.8.2 The distribution and wiring system have been installed per NFPA 70, National Electrical Code. See exception

3.8.3 There is a 25KVA transformer on the unit to provide single phase power of 240/120 volt. The transformer has fault protection on the primary side.

3.8.4 A 100KW load bank is on the unit. The load bank is divided into 3 sections, 2 (two) 25KW and 1 (one) 50KW sections, which may be manually switched on individually as required to maintain the generator near 70% of capacity. The load bank is wired for operation in parallel with the normal load.

3.8.5 The electrical equipment furnished by the engine-generator set Supplier, mounted on the equipment rack outside of the engine-generator set enclosure, and wired to the generator output terminals via a 3-phase, 4-wire bus is as follows: (Rated current capacity of components shall not be less than the rating requested.)

C/K 3.8.5.1 One (1), 3-pole, 3-wire, 150 amp rated, 80 amp trip, 600 VAC, lockable circuit breaker. A 100 amp. receptacle is on the load side of the circuit breaker and is labeled as **"SERVICE TRAILER 240 VAC 80 AMPS"**. The receptacle is an Appleton Cat. # ADR1034.

C/K 3.8.5.2 One (1), 3-pole, 3-wire, 150 amp rated, 50 amp trip, 600 VAC, time delay lockable circuit breaker. A 60 amp. receptacle is on load side of the circuit breaker and is labeled as **"BREATHING AIR COMPRESSOR 480 VAC 50 AMPS"**. The receptacle is an Appleton Cat. # ADR6034.

C/K 3.8.5.3 One (1), 3-pole, 3-wire, 200 amp rated, 110 amp trip, 600 VAC, lockable circuit breaker. A 200 amp. receptacle to the load side of the circuit breaker and label receptacle as **"UTILITY 480 VAC 110 AMPS"**. The receptacle is an Appleton Cat. # ~~ADR20044~~ AR30044. ADR not available C/K

C/K 3.8.5.4 One (1), 20 amp, 240 VAC, single receptacle, wired from a two pole, 20 amp breaker to be used for hookup of temporary power boxes. Labeled as **"240 VAC 20 AMPS"**.

C/K 3.8.5.5 One (1), 20 amp, 120 VAC, duplex receptacle, wired from a single pole, 20 amp breaker with ground fault protection, to be used for hookup of temporary tools and lighting. Labeled as **"120 VAC 20 AMPS"**.

C/K 3.8.5.6 One (1), 30 amp, 120 VAC, single receptacle, wired from a single pole, 30 amp breaker. Labeled as **"PURGE GAS TRAILER 120 VAC 30 AMPS"**.

____ 3.8.6 The unit has grounding rods and a 100 foot cable to allow grounding to a ground grid. To be verified at receipt Inspection. C/K

#4 copper minimum. C/K

3.9 Verify the following engine-generator trailer requirements are satisfied:

GJK 3.9.1 The engine-generator set including all accessories are mounted on a heavy duty type trailer designed for use in construction, communications, and utility applications.

GJK 3.9.2 The trailer meets Department of Transportation (DOT) requirements for highway travel. (DOT Certification)

GJK 3.9.3 Vibration isolators are used between the engine-generator set and the ~~trailer.~~ Generator frame.

GJK 3.9.4 The trailer is equipped with running lights, brake lights, safety brake, stabilizer jack on each corner; a front wheel jack with wheel; and hitches.

GJK 3.9.5 The trailer has a 2 3/4 inch Lunette hitch with vertical adjustment.

GJK 3.9.6 The underside of the trailer is undercoated for rust protection.

GJK 3.9.7 The trailer has hydraulic surge type brakes.

GJK 3.9.8 The generator is within an enclosure and the enclosure is lined with sound deadening material.

GJK 3.9.9 The instruments and controls are vibration isolated to prevent gauge and control malfunction.

3.10 Verify the following engine requirements are satisfied:

GJK 3.10.1 Diesel fuel engine.

GJK 3.10.2 Engine shall be electric start from negative grounded battery supplied.

GJK 3.10.3 Battery shall be charged with alternator having automatic voltage regulation supplied with engine.

GJK 3.10.4 A fuel tank is on the unit that will supply fuel for the engine to operate at full load for at least 24 hours. (Capacity 250 gal, Consumption rate 9.7 gal/hr)

GJK 3.10.5 Two (2) stage dry type air cleaner with a restriction gauge.

GJK 3.10.6 Furnished with the capability for cold weather starting such as electric glow plugs. Engine hot start 1500 watt, 110 volt heater.

GJK 3.10.7 Record the freeze point of the engine antifreeze. (-40 °F)

GJK 3.10.8 Drip pan to catch fuel or oil leaks.

GJK 3.10.9 Painted inside and out. Exterior is White.

GJK 3.10.10 Verify there are no Suspect Fasteners as identified on the U.S. Custom's Fasteners Headmark List.

GJK 3.10.11 Verify all visible welds are acceptable per AWS D1.1.

4.0 Run Test

4.1 No Load Cold start: Verify that the engine starts and comes to 1800 ±9 rpm in the specified time. (MFR 0 - 10 sec.)

GJK 4.1.1 Switch **Run-Off-Auto** switch to **Run**.
(Time from close of contacts to 1800 rpm 2 sec.)

4.1.2 Verify the following instrumentation is functional and the value indicated is within the range specified by the manufacturer:

GJK 4.1.2.1 Engine lube oil pressure gauge.
(75 psi, MFR 10 - 75 psi)

GJK 4.1.2.2 Coolant temperature gauge.
(175 °F, MFR 65 - 215 °F)

AK 4.1.2.3 Hour meter.
(1.6 hrs)

AK 4.1.2.4 Battery volt meter.
(28 volts, MFR 24 - 30 volts)

AK 4.1.2.5 Fuel gauge for day tank.
(~~Empty~~ level)

N/A 4.1.2.6 Other instruments normally provided by the manufacturer for the proper operation and maintenance of their particular engine-generator set.

AK 4.1.3 Record and with a sound meter the generator noise level at the electrical control panel and verify that it is less than 85 decibels. 88 decibels. Lot of trapped noise at test site AK

4.2 Loaded Cold start with Remote/Auto start: Verify, with the 100 KW load bank on line, that the engine starts, comes to 1800 ±9 rpm, and the load is automatically switched on-line in the specified time. (MFR 6 - 10 sec.)

AK 4.2.1 Switch Run-Off-~~Auto~~ Remote switch to ~~Auto~~ Remote.

AK 4.2.2 Close contacts on a temporarily installed switch. (Time from close of contacts to ~~load on-line~~ Full Speed. 2 sec.)

AK 4.2.3 Switch Run-Off-~~Auto~~ Remote switch to Off. (Remove temporary switch.)

4.3 Verify controls shutdown and lock out the engine under the following simulated abnormal operating conditions. (Temporarily install contacts and jumpers as required to simulate conditions. Restart the generator between each alarm test.) Verify alarm test switch, lamp test switch and alarm reset switch are operational:

AK 4.3.1 Engine failure to start after a specified cranking time, with ~~alarm.~~ light — 3 cycles 15 on 15 off,

AK 4.3.2 Engine over-speed, with ~~alarm.~~ light 2100, ref factory test.

AK 4.3.3 Engine low lube oil pressure, with ~~alarm.~~ light Pre Low Oil Pressure

AK 4.3.4 Engine high operating temperature, with ~~alarm.~~ light Pre High Engine Temp.

AK 4.3.5 Remote manual stop activated. ~~(Located on distribution panel).~~ Temporary switch.

4.4 Verify proper operation of the generator, power distribution components and load bank according to the manufacturer's supplied information. (For load bank test operate for 15 minutes at each step prior to recording information.)

4.4.1 Step 1 (25KW Resistive Load for 15 min.) GJK

GJK 4.4.1.1 Amperage 1 ~~30~~ 30, 2 ~~30~~ 30, 3 ~~30~~ 30 amps

GJK 4.4.1.2 Voltage 1-2 480, 2-3 480, 1-3 480

GJK 4.4.1.3 Frequency 62.5 Hz

GJK 4.4.1.4 Oil Pressure 70 psi

GJK 4.4.1.5 Water Temperature 170 °F

4.4.2 Step 2 (50KW Resistive Load for 15 min.)

GJK 4.4.2.1 Amperage 1 60, 2 60, 3 60 amps

GJK 4.4.2.2 Voltage 1-2 480, 2-3 481, 1-3 481

GJK 4.4.2.3 Frequency 62.15 Hz

GJK 4.4.2.4 Oil Pressure 70 psi

GJK 4.4.2.5 Water Temperature 170 °F

4.4.3 Step 3 (100KW Resistive Load for 15 min.)

GJK 4.4.3.1 Amperage 1 119, 2 119, 3 119 amps

GJK 4.4.3.2 Voltage 1-2 480, 2-3 481, 1-3 480

GJK 4.4.3.3 Frequency 61.4 Hz

GJK 4.4.3.4 Oil Pressure 70 psi

GJK 4.4.3.5 Water Temperature 170 °F

4.4.4 Verify voltage and clockwise phase rotation as noted for the following:

GJK 4.4.4.1 **UTILITY 480 VAC 110 AMPS** outlet

4.4.4.1.1 Phase rotation CW

4.4.4.1.2 Voltage 1-2 480 2-3 481, 1-3 481

GJK 4.4.4.2 **SERVICE TRAILER 240 VAC 80 AMPS** outlet

4.4.4.2.1 Voltage 1-2 239

GJK 4.4.4.3 **BREATHING AIR COMPRESSOR 480 VAC 50 AMPS** outlet

4.4.4.3.1 Phase rotation CW

4.4.4.3.2 Voltage 1-2 481, 2-3 481, 1-3 481

GJK 4.4.4.4 **240 VAC 20 Amp** Single Receptacle

4.4.4.4.1 Voltage 239

GJK 4.4.4.5 **120 VAC 20 Amp** Duplex Receptacle

4.4.4.5.1 Voltage 120

GJK 4.4.4.6 **PURGE GAS TRAILER 120 VAC 30 Amp** Single Receptacle

4.4.4.6.1 Voltage 120

GJK 4.4.5 Switch **Run-Off-Auto** switch to **Off**.

4.5 No load hot start: Verify that the engine starts and comes to 1800 rpm in the specified time. (MFR 6 - 10 sec.)

GJK 4.5.1 Switch **Run-Off-~~Auto~~** (Remote) switch to **Run**. Time 2 sec.

GJK 4.5.2 Switch **Run-Off-~~Auto~~** (Remote) switch to **Off**.

4.6 Loaded hot start: Verify, with the 100 KW load bank on line, that the engine starts, comes to 1800 ±9 rpm, and the load is automatically switched on-line in the specified time. (MFR 6 - 10 sec.)

GJK 4.6.1 Switch **Run-Off-~~Auto~~** (Remote) switch to **Run**.
(Time from close of contacts to ~~load on-line~~ Full Speed. 2 sec.)

GJK 4.6.2 Switch **Run-Off-~~Auto~~** (Remote) switch Off.

TEST EXCEPTIONS

Step #	Description of exception and resolution.
3.8.2	Grounding 1) Generator frame should be bonded to trailer frame. 2) Provide chase through circuit breaker enclosure (mounted on rear of trailer) for grounding electrode conductor to neutral/ground bus. C/K Verify upon receipt inspection. C/K
3.2.2	Frequency for full load factory set @ 60 Hz. Test data shows variance which is explained by lack of full load during test. Trend of frequency indicates the equipment is capable. C/K

TEST COMPLETED BY:

PRINT NAME	COMPANY	SIGNATURE	DATE
Alois J Kostelnik	WHC	Alois J Kostelnik	9-26-94
CUMMINS NORTHWEST INC			9-26-94

* Make additional copies as required.

SUSPECT FASTENER HEADMARK LIST

Westinghouse Hanford Company

Help Stamp Out Suspects/Counterfeits

Suspect Fastener Headmark List

All Grade 5 and Grade 8 fasteners of foreign origin which do not bear any manufacturers' headmarks:


Grade 5


Grade 8

Grade 5 fasteners with the following Manufacturers' headmarks:

Mark	Manufacturer	Mark	Manufacturer
J	Jinn Her (TW)	KS	Kosaka Kogyo (JP)

Grade 8 fasteners with the following Manufacturers' headmarks:

Mark	Manufacturer	Mark	Manufacturer
A	Asahi Mgf (JP)	KS	Kosaka Kogyo (JP)
NF	Nippon Fasteners (JP)	RT	Takai Ltd (JP)
H	Hinomoto Metal (JP)	FM	Fastener Co. of Japan (JP)
M	Minamida Seybo (JP)	KY	Kyoei Mfg (JP)
MS	Minato Kogyo (JP)	J	Jinn Her (TW)
Hollow Triangle	Intasco (CA, TW, JP, YU) (Greater than 1/2-inch diameter Grade 8 Hollow Triangle only)		
E	Daisi (JP)	UNY	Unytite (JP)

Grade 8.2 fasteners with the following headmarks:

Mark	Manufacturer
KS	Kosaka Kogyo (JP)

Grade A325 fasteners (Bennett Denver target only) with the following headmarks:

	Mark	Manufacturer
Type 1	A325 KS	Kosaka Kogyo (JP)
Type 2		
Type 3		

Key: CA-Canada, JP-Japan, TW-Taiwan, YU-Yugoslavia

Any bolt on this list should be treated as defective without further testing.

Onan

GENERATOR SET

Model	150DGFA 68913H	S/N	F940547197
Customer	CUMMINS NORTHWEST INC	Order File Number	U434358D/P.O. 11353R

SERVICE RATING			
	X Prime	KW 135	KVA 169
	___ Standby	KW	KVA

FUEL TYPE	___ Gasoline X Diesel ___ LP Vapor ___ LP Liquid ___ Nat Gas ___ Other
GOVERNOR TYPE	X Mechanical ___ Electrical; Brand BOSCH
COOLING SYSTEM	X Mounted Radiator ___ Remote Radiator ___ Heat Exchanger; Other

ITEMS CHECKED/ ADJUSTED

X Governor	X Remote Start	X Voltage Regulator
X Oil Pressure Pre-Alarm	X Oil Pressure Shutdown	X Meter Accuracy
X Hi Cool Temp Pre-Alarm	X Hi Cool Temp Shutdown	___ LET Alarm
X Overspeed 2100 RPM	X Overcrank Sec 16 Crank 16 Rest 83 Total	
X Other: List: B255 F001 H462 H480 KH22 H389 K001		

TEST CONDITIONS

Test Spec.	Ambient Temp	Barometer	Voltage	Phase	Frequency
98126	85 Deg F	28.47 In Hg	277/480 V	3	60 Hz

UNIT RESULTS*

No Load >	Batt Charge Syst 28.01 X Volts ___ Amps	Voltage 1-2 482	2-3 482	1-3 482
	Volt Reg Adj 450-517	1-N 278	2-N 278	3-N 278
	Frequency 62.7 HZ	Coolant Temp 176	Lube Press 66	Phase Sequence X UVW ___ Other
Full Load (4 / 4) >	Batt Charge Syst 28.01 X Volts ___ Amps	Voltage 1-2 480	2-3 480	1-3 480
		1-N 277	2-N 277	3-N 277
	KW 135	Current 1 203	2 203	3 203
	Frequency 60 HZ	Coolant Temp 178	Lube Press 62	Power Factor .8

Maximum Power	Freq	Voltage	ISO Correction Factor	Test Date	Running Time
167	59.6 HZ	481	1.0	07/15/94	.8

Data Recorded & Certified By: R HOGEN 4139	Quality Engineer: T. J. McCauley	Date: 7/21/94

X22A041-Front 1/90 * If unit is dual fuel, see additional sheet for second fuel results.
19-78 (See reverse side for extended running time data.)

22A054 10/91

Mail to Cummins Northwest, Inc. 811 SW Grady Way Renton, Wa. 98055 Attn: ...

D. Young 8/1/94

--RUNNING------			-----MAX----SURGE--At Specified Voltage---			
KW	KVA	PF	KW	Occurs in Step	KVA	Occurs in Step
135	135	1.00	135	1	135	1

Recommended GenSet Model: 150DGFA

GenSet Voltage: 208-240/416-480

Nominal KW	Duty	Specified Voltage	Freq.	Specified	Alternator Recommended
150	Standby	277/480 WYE	60	105	105

When operated at 500 Feet Altitude
and 77 degrees Fahrenheit Ambient the
operating performance is:

* GenSet selected with one GenSet. *

Maximum KW	Voltage Dip	Freq. Dip	Excitation
150	19%	8%	Shunt

Onan Corporation has developed this GenSize 2 computer program to help you, the engineer, with a generator set selection. The recommendations are based upon your input of the genset requirements and typical performance data published by NEMA and other agencies.

Due to changing load and site conditions beyond our control, we cannot be certain the selection of a genset based upon the recommendation of this computer program will meet the site requirements. Therefore, nothing in this program may be construed as a warranty. You must decide for yourself or consult with your local Cummins/Onan distributor that the generator set selected is sufficient for your intended purpose. Each Onan generator set is covered by an express written warranty which is in lieu of all other warranties, expressed or implied.

Please consult with your Cummins/Onan distributor representative in your area for further information.

File Name: UNTITLED

and engine/alternator capacity.	135	KVA	187	Acceptable
2. Running load requirements and alternator capacity at site conditions.	135 135	KW KVA	150 187	Acceptable Acceptable
3. Max load surge KVA and Max set KVA capacity with minimum 90% sustained voltage.	135	KVA	563	Acceptable
4. Max load Surge KW and Max set Surge KW capacity at site conditions with minimum 90% sustained voltage.	135	KW	189	Acceptable
5. Transient Voltage Dip: Allowable Transient Voltage Dip:	19 35	% %		Acceptable
6. Total non-linear plus linear load KW and Alternator KW capacity.	135	KW	150	Acceptable

N CORPORATION GenSize 2 Version 4.00 File Nam

Project Name: (WESTINGHOUSE HANFORD)
Project Parameters:

Duty:	Stationary Standby
Voltage:	277/480 WYE
Frequency	60
Max. Temp. Rise	105
Max. VDIP%	35
Max. Altitude	500
Altitude Scale	Feet
Max. Amb. Temp	77
Temperature Scale	Fahrenheit
Cooling System	Radiator
Fuel Type	Diesel

Load Listing

umber: 1 Load Type: Resistive Phase 3

ame: (135 KW PRIME) Input KW: 135
t:

KW:	SKVA:	SKVAR:	SPF:	RKW:	RKVA:	RKVAR:	RPF:
5.0	135.0	0	1.00	135.0	135.0	0	1.00

Step Sequence/Load

umber: 1 Surge KW: 135 Surge SKVA: 135

ame: START 135 KW PRIME LOAD
t:

Qty	SKW	SKVA	SKVAR	SPF	RKW	RKVA	RKVAR	RPF
1	135.0	135.0	0	1.00	135.0	135.0	0	1.00
otal:								
	135.0	135.0	0	1.00	135.0	135.0	0	1.00
tive:								
	135.0	135.0			135.0	135.0	0	

ia Selection Results:
150DGFA

	Required by Loads	Available from Model	Result
ning load requirements	135 KW	150	Acceptable

Westinghouse Hanford Company

Internal Memo

From: Electrical Power Systems Engineering
Phone: 376-8109 L4-90
Date: October 17, 1994
Subject: CORE SAMPLING EQUIPMENT GENERATORS

To: Al Kostelnik R1-17

cc: CMM File/LB

Two Diesel generator sets by Cummins Diesel, 800 Grady Way, Renton Washington, 200 Kva each. The generators are 480Y/277 volt units.

The generators are installed on trailers fabricated for the units. The trailers have an industrial control panel enclosure. The enclosure is a NEMA 4 outdoor rated enclosure. The control panel has a dead front through which the handles of all circuit breakers are accessible.

The circuit breakers are properly rated and installed. Wire sizes were examined and found to be correct.

Also on the trailer is a 25 Kva transformer to supply 120/240 volt single phase power. The neutral ground point is located in the industrial control panel. A 100 KW load bank is mounted on the front of the generator unit. The load bank can be switched to provide load in increments of 25 KW.

Items requiring further attention.

1. The only provision for connection of a grounding electrode is inside the generator enclosure. A mechanical set screw type lug is bolted to the generator frame,inside the louvered door on the right side of the unit. This location does not allow connection of the grounding electrode conductor and closing of the louvered doors.

2. The generator neutral is internally grounded to the generator frame, however the generator is mounted on rubber vibration isolation pads. The neutral ground point of the generator and the trailer mounted transformer must be the same point.

3. The procurement specifications require that two ground rods (size was not specified) and 100 feet of grounding electrode conductor be provided. The grounding electrode conductor and the ground rods were not provided with the two units observed.

4. The acceptance criteria called for rotation checks of the three phase power. All three phase circuit breakers and receptacles were checked and found to have consistent clockwise rotation. However, the rotation required by the actual three phase loads to be connected was not evaluated.

Recommendations.

1. The neutral and equipment grounds are connected to a terminal bar located inside the industrial control enclosure. It is recommended that a chase be provided through the enclosure, below the level of all enclosed components, to allow the appropriate grounding electrode conductor to be routed from the grounding electrode selected to the neutral grounding bar inside the enclosure. This chase will allow the grounding electrode conductor to connect the grounding bar to the grounding electrode without splice or tap.

2. The generator housing is bonded to the generator frame with a braided bonding strap. A similar bonding strap should be provided to bond the generator frame to the trailer frame.

3. Include two 5/8 X 10 ground rods and 100 feet of # 4 AWG copper wire for connection to a grounding electrode system. The required grounding electrode conductor for the ground rods is #6 AWG.

4. A bump test for rotation check of all three phase motor loads will have to be accomplished at the time of first connection to the generator unit.

Conclusion. There were no NEC violations or safety issues not mentioned above that would prevent this unit from safely performing it's intended function.

CM Monasmith, NEC Interptative Authority
Electrical Power Systems Engineering

rmg

QUALITY ASSURANCE INSPECTION PLAN

Sheet 1 of 2
Safety Class 3

Item Title
Diesel Generator

Drawing/Spec. No. WHC-S-0252 Rev. 1
Item Description Diesel Generator
Supplier Cummins Northwest Inspection No. 2799
P.O. Subcontract 404866

Prepared by
Al Kostelnik / J. Verderber
Date
10-7-94

Item No. 192 Qty. 1 of 1 Inspected by [WHC QUALIFIED INSPECTOR] Date 10-27-94
Reference

Char. No.	Inspection Characteristics	INSPECTION STATUS					Remarks
		Acc	Hld Tag	Rej	NCR	Cond. Acc	
	SAMPLE SIZE DETERMINATION Sample size (number of items to be inspected in a lot), shall be determined by using Table I and Table III-A of the latest edition of MIL-STD-105 as follows: • Select the Sample Size Code Letter from Table I, based on the lot size of material received and the General Inspection Level indicated by the QAIP (Level I, II, or III). • Select the sample size from Table III-A using the Sample Size Code Letter obtained from Table I and the AQL number specified by the QAIP. • The minimum sample size utilizing Level II, AQL 4.0, Table III-A shall be 8 or 100%, if the lot size is less than 8. NOTE: If any samples are found nonconforming, the entire lot shall be placed on HOLD pending engineering evaluation and NCR disposition.						
1	Verify the Diesel Generator Trailer was not damaged during shipment.	NOV 01 1994 [WHC QUALIFIED INSPECTOR]					
2	Verify a wire chase has been installed on the Electrical Distribution panel at the rear of the trailer which consists of a short section of Rigid Galvanized Steel conduit which is bent with the end turned down to keep rain from entering the cabinet.	NOV 01 1994 [WHC QUALIFIED INSPECTOR]					
3	Verify that a ground strap has been installed to electrically bond the generator frame to the trailer frame. (Probably located inside of the generator enclosure on the right side. One strap grounds the generator to the frame and the second strap grounds the frame to the trailer.)	NOV 01 1994 [WHC QUALIFIED INSPECTOR]					
4	Verify there is a minimum of 100 feet of #4 CU wire provided.	[WHC QUALIFIED INSPECTOR]					

QUALITY ASSURANCE INSPECTION PLAN
(Continuation Sheet)

Sheet 2 of 2
Safety Class 3

Item Title: Diesel Generator

Drawing/Spec. No. WHC-S-0252 Rev. 1
P.O. No. 404866
Item No. 1 & 2

Char. No.	Inspection Characteristics	INSPECTION STATUS					Remarks
		Acc	Hld Tag	Rej	NCR	Cond. Acc	
5	Verify there are no Suspect Fasteners on the Generator Trailer.	NOV 01 1994 WHC 125					
6	Verify Receipt of 8 copies of Vendor Data. A. Assembly drawings showing general equipment layout, subassembly details, critical interface dimensions and identification of all major components of the engine and the generator. Layout and wiring diagrams of the receptacles on the engine-generator set shall be shown. B. Schematic electrical drawings of wiring systems, including operating and safety devices, control panels, instrumentation and alarms. Include make, model and part numbers of items. C. Operating and maintenance instructions. D. Pictorial parts list and part numbers. E. Recommended spare parts list. F. Recommended maintenance procedures. G. Short-circuit current capability at the generator output terminals.	NOV 0 1994 WHC 125					