



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Permit No.: R13-2290L
Plant ID No.: 099-00007
Applicant: Department of Veterans Affairs (VA) Medical Center
Facility Name: Huntington VA Medical Center
Location: Wayne County
SIC Code: 62211 - General Medical and Surgical Hospitals
Application Type: Modification
Received Date: April 20, 2015
Engineer Assigned: John Legg
Fee Amount: \$2,000.00
Date Paid: April 21, 2015
Applicant Ad Date: April 14, 2015
Newspaper: Herald Dispatch (Huntington, WV)
Complete-By Date: September 1, 2015 (Affidavit of Publication arrived 6/4/14 at DAQ)
UTM's: Easting: 367.44 km Northing: 4,248.49 km Zone: 17
Lat/Longs: Latitude: 38.3778 N Longitude: -82.5167 W
Description: Replace an older emergency generator with a newer one. The new emergency generator engine is EPA, Tier 2 compliant/certified to meet the requirements of 40 CFR 60 Subpart IIII for the 2015 model year. The manufacturer and model number for the new generator are: Caterpillar C18 ATAAC. The new emergency generator will be installed in Building 52.

SUMMARY

The VA Medical Center proposes to replace an older (installed 1987), 600 kW, diesel-fueled, emergency generator with a new 600 kW, Caterpillar C18 ATAAC, diesel-fired, emergency generator to provide electricity to the facility when purchased power is not available.

Based on operating the new generator engine 500 hr/yr, Caterpillar estimates emissions at: nitrogen oxides (NO_x) at 11.41 lb/hr and 2.86 ton/yr; carbon monoxide (CO) at 0.91 lb/hr and 0.23 ton/yr; and particulate matter (PM) at 0.06 lb/hr and 0.01 ton/yr.

PROCESS DESCRIPTION

Before this modification, the VA Medical Center operated eleven (11) permitted diesel oil-fueled emergency generators of various design capacities (134 bhp to 1322 bhp) and installation dates (1996 through 2014). The new diesel, oil-fueled emergency generator (shown below in red) will bring the permitted total to twelve (12). The old engine that was installed in 1987 and is being replaced was grand-fathered.

Table 1: Permitted Diesel Oil-fired Emergency Generator Engines located at the VA Medical Center, Huntington, Wayne County, WV.

Emission Unit ID	Emergency Generator Description		Permitted Under	Year Installed	Design Capacity	Control Device
E-Gen 25	Uncertified	275 kW, Cummins	R13-2290B	1996	435 bhp	None
E-Gen 23R	Uncertified	440 kW, Caterpillar	R13-2290B	1995	???	None
E-Gen 3a	Uncertified	80 kW, John Deere	R13-2290B	1998	150 bhp	None
E-Gen 3b	Uncertified	125 kW, Onan	R13-2290E	2001	207 bhp	None
E-Gen 2	Uncertified	125 kW, Onan	R13-2290F	2006	207 bhp	None
E-Gen 1S	Certified	900 kW, Onan	R13-2290H	2009	1,322 bhp	None
E-Gen Mobile	Certified	400 kW, Cummins	R13-2290I	2011	755 bhp	None
E-Gen 5	Certified	350 kW, Caterpillar	R13-2290I	2011	546 bhp	None
E-Gen 16	Certified	100 kW, Caterpillar	R13-2290J	2014	134 bhp	None
E-Gen Mobile 2	Certified	100 kW, Cummins	R13-2290K	2014	324 bhp	None
E-Gen Mobile 3	Certified	150 kW, Cummins	R13-2290K	2014	324 bhp	None
E-Gen 52	Certified	600 kW, Caterpillar	R13-2290L	2015	900 bhp	None

Table 2: Information on New Diesel Generator Engine to be Located at the VA Medical Center, Huntington, WV.

Emergency Generator Engine (E-Gen 52)	
Source ID No.	E-Gen Bldg 52
Manufacturer	Caterpillar
Model	C18 ATAAC
Model Year	2015

Table 2: Information on New Diesel Generator Engine to be Located at the VA Medical Center, Huntington, WV.

Emergency Generator Engine (E-Gen 52)	
Manufacturer's Rated bhp/rpm	900/1800
Date Installation	2015
Engine Manufactured	2015
Source Status	New Source
Is this a Certified Stationary Spark Ignition Engine according to 40 CFR 60 Subpart IIII?	Yes
Engine Type	Lean Burn Four Stroke (LB4S)
Fuel Type	#2 Fuel Oil (Ultra Low Sulfur Diesel - ULSD)
Displacement	4.4 L
Fuel Consumption	42.7 gal/hr
Operation	500 hr/yr

SITE INSPECTION

The writer did not inspect the VA Medical Center located in Huntington because the hospital is routinely inspected by DAQ's Charleston Office . Enforcement Inspector Mike Rowe last inspected the facility on July 26, 2012. At that time the facility was found to be in compliance and was given the inspection code 30.

Directions to the VA Medical Center as given in application:

From Huntington, WV - Rt. 60 W to Carson Street. Left on Carson St. To Spring Valley Dr. Turn right and proceed to VA entrance.

ESTIMATE OF EMISSIONS

Emission rates for the new/replacement, diesel-fueled emergency generator engine were calculated using emission factors provided by the engine manufacturer/Caterpillar and are based on operating the generator a maximum of 500 hr/yr. In addition to providing electricity when purchased power is unavailable, the generator will be operated for the purpose of maintenance checks and readiness testing.

Table 3: Hourly and Annual Emissions from the VA Medical Center's New Diesel Oil-fired, Emergency Generator to be located at Huntington, WV.					
Pollutant		Maximum Emissions (Uncontrolled)			
		Caterpillar C18 ATAAC, 900 bhp/600 kW Emergency Generator Set			
		(g/hp-hr)⁽¹⁾	(lb/hr)	(ton/yr)⁽²⁾	(ton/yr)⁽³⁾
Criteria Pollutants	Nitrogen Oxides (NO _x)	5.75	11.41	2.86	51.11
	Carbon Monoxide (CO)	0.46	0.91	0.23	4.09
	Hydrocarbon (HC)	0.01	0.02	0.00	0.09
	PM	0.03	0.06	0.01	0.27

(1) Estimated using Manufacturer's Information.
(2) Annual Based on 500 hr/yr of operation.
(3) Annual Based on 8,760 hr/yr of operation.

Table 4: Storage Tank Data Given in Permit Application R13-2290L.							
Source ID #	Status	Content	Volume	Dia.	Throughput	Orientation	Liquid Height
E-Gen Bldg. 52		#2 Diesel (ULSD)	100 gal double wall supply day tank				
			Generator main fuel source is a 2,000 gal double wall STI-P3 UST (UST-3A)				

REGULATORY APPLICABILITY

After this modification (R13-2290L), the VA Medical Center will remain a non-major, stationary source under Rule 13, a deferred Title V source and an area source for Hazardous Air Pollutants (HAPs).

The following State and Federal Rules were examined for applicability:

- 45CSR13 - "Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation."

The VA Medical Center is an existing stationary source that already has a Rule 13 permit (R13-2290K).

The installation of the replacement generator is considered to be a modification because the generator engine is subject to NSPS Subpart III.

The VA Medical Center submitted a complete application, ran a legal advertisement, and paid a \$2,000 application fee to modify their current permit.

45CSR16 "Standards of Performance for New Stationary Sources"

Adopts by reference the standards of performance for new stationary sources promulgated by the United States Environmental Protection Agency pursuant to section 111(b) of the federal Clean Air Act, as amended (CAA). This rule codifies general procedures and criteria to implement the standards of performance for new stationary sources set forth in 40 CFR Part 60. The rule also adopts associated reference methods, performance specifications and other test methods which are appended to these standards.

40 CFR 60, Subpart III applies to the new diesel engine. See below.

40CSR30 - "Requirements for Operating Permits."

The facility is considered to be a deferred non-major Title V. The replacement emergency generator has no affect on Title V applicability.

45CSR34- "Emission Standards for Hazardous Air Pollutants for Source Categories Pursuant to 40 CFR, Part 63"

This rule establishes and adopts a program of national emission standards for hazardous air pollutants (NESHAPS) and other regulatory requirements promulgated by the United States Environmental Protection Agency pursuant to 40 CFR Parts 61, 63 and section 112 of the federal Clean Air Act, as amended (CAA). This rule codifies general procedures and criteria to implement emission standards for stationary sources that emit (or have the potential to emit) one or more of the eight substances listed as hazardous air pollutants in 40 CFR §61.01(a), or one or more of the substances listed as hazardous air pollutants in section 112(b) of the CAA. The Secretary hereby adopts these standards by reference. The Secretary also adopts associated reference methods, performance specifications and other test methods which are appended to these standards.

40 CFR 63, Subpart ZZZZ was review for applicability. See below.

40 CFR 60 Subpart III, “Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.”

On July 11, 2006 the USEPA issued the NSPS for Stationary Compression Ignition (CI) Internal Combustion Engines (ICE). This rule outlines standards of performance for stationary compression ignition (CI) internal combustion engines (ICE). The rule segments applicability primarily by whether the applicant is an engine manufacturer, or an owner/operator.

The VA Medical Center is subject to Subpart III because the new emergency generator engine is a stationary CI ICE that commenced construction after July 11, 2005, and were manufactured after April 1, 2006 and is not a fire pump engine.

The generator engine is USEPA Certified for the engine manufacturer/Caterpillar and as such is not required to perform an initial performance test. The unit will be operated as an emergency generator and will be limited to 100 hours per year for operation during non-emergency times and 500 hours per year for total operation. Additionally, the unit will be required to maintain a maintenance plan and associated records.

Diesel Generator Set	Engine Manufacturer/ Certificate Issued to:	Engine Family	Certificate Number
Standby 600 ekW, 750 kVA, 60 Hz, 1800 rpm, 480 Volts	Caterpillar	FCPXL18.1NYS	FCPXL18.1NYS-003

40CFR63, Subpart ZZZZ “National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines”

Subpart ZZZZ establishes national emission limitations and operating limitations for HAPs emitted from stationary RICE located at major and area sources of HAP emissions. The subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.

The VA Medical Center is classified as an area source of HAP emissions (individual HAP with potential emissions less than or equal to 10 ton/yr; aggregated HAP with potential emissions less than or equal to 25 ton/yr) and will remain so after this modification.

The internal combustion engine for the emergency generator set is classified as an affected source under 40 CFR 63 Subpart ZZZZ. §§63.6590 (c) and (c)(1) state that for engines located at an area source of HAPs, if the source meets the requirements of Subpart IIII that no requirements of Subpart ZZZZ apply to the engine. Thus, the proposed engine is not subject to any requirements of this subpart.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The combustion of #2 diesel fuel in the new emergency generator results in the formation very small amounts of Hazardous Air Pollutants (HAP). The new engine will not emit any pollutants that are not already being emitted by other sources at the facility.

AIR QUALITY IMPACT ANALYSIS

The proposed modification is not classified as a major source as defined by 45CSR14 (PSD). For this reason no air quality modeling was required.

MONITORING OF OPERATIONS

60 CFR 60 Subpart IIII sets specific monitoring and record-keeping requirements for this limited use/emergency generator engine:

- Documenting the purpose for operating the engine and
- Performing regular, routine maintenance.

No additional monitoring was deemed necessary.

CHANGES MADE TO OLD PERMIT (R13-2290K)

The following changes were made to R13-2290K to arrived at R13-2290L:

- Permit number changed (on front cover and on top of each page) to R13-2290K from R13-2290L.
- The issued date was changed to Draft.
- The Description of Change was updated.
- E-Gen 52, the new generator were added to the 1.0 Emission Units Table, page 5 in the permit.
- The previously issued permit in section 2.4.1. was changed to R13-2290K.
- E-Gen 52, the new generator was added to section 4.1.2's list of generators that are EPA certified.

The above changes are shown in red in the compare file which is attached to this evaluation.

RECOMMENDATION TO DIRECTOR

The VA Medical Center's request to replace and operate one (1) diesel-fueled emergency generator at the Huntington, Wayne County, WV facility meets the requirements of 45CSR13 (Rule 13) and all other applicable rules, and therefore should be granted a Rule 13 modification permit (R13-2290L).



John Legg
Permit Writer

June 18, 2015

Date

Permit to Modify



R13-~~2290K~~2290L

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§22-5-1 et seq.) and 45 C.S.R. 13 – Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation. The permittee identified at the above-referenced facility is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:
**Department of Veterans Affairs
VA Medical Center -Huntington
099-00007**

William F. Durham
Director

Issued: ~~January 13, 2015~~Draft

This permit supersedes and replaces previously issued Permit R13-~~2290J~~2290K.

Facility Location: 1540 Spring Valley Drive

Huntington, Wayne County, West Virginia 25704

Mailing Address: Same as above

Facility Description: Medical Treatment Facility

NAICS Codes: 622210 – General Medical and Surgical Hospitals

UTM Coordinates: 367.44 km Easting • 4,244.85 km Northing • Zone 17

Permit Type: Modification

Description of Change: ~~This action is for the installation of two additional~~ Replace an old (installed in 1987), diesel-fueled, 600 kW emergency generator sets with a new diesel-fueled, 600 kW emergency generator.

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §§22-5-14.

As a result of this permit, the source is a nonmajor or area source subject to 45CSR30. Therefore, the facility is not subject to the permitting requirements of 45CSR30 and is classified as a deferred source.

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
E-Gen 5		350 kW Generator Set Mfg. Caterpillar Engine Family No. ACPXL15.2ESX Certificate No. CPX-NRCI-10-30	2011	546 bhp	None
E-Gen 16		100kW Generator Set Mfg. Caterpillar/Perkins Engine Co. Engine Family No. DPKXL04.4NJ1 Certificate No. DPKXL04.4NJ1-005 Location: Bldg. #16	2014	134bhp	None
E-Gen Mobile 2		100kW Generator Set Mfg. Cummins Model No. 100DSGAA Engine Family No. ECEXL0409AAD Certificate No. ECEXL0409AAD-007 Location: T1 Modular IRM	2014	324 bhp	None
E-Gen Mobile 3		150kW Generator Set Mfg. Cummins Model No. 150DSGAC Engine Family No. ECEXL0409AAD Certificate No. ECEXL0409AAD-007 Location: Bldg.#6,7,8	2014	324 bhp	None
<u>E-Gen 52</u>		<u>600 kW Generator Set</u> <u>Mfg. Caterpillar</u> <u>Model No. C18 ATAAC</u> <u>Engine Family No. FCPXL18.1NYS</u> <u>Certificate No. FCPXL18.1NYS-003</u> <u>Location: Bldg. 52</u>	<u>2015</u>	<u>900 bhp</u>	<u>None</u>

2.3. Authority

This permit is issued in accordance with West Virginia Air Pollution Control Act W.Va. Code §§ 22-5-1. et seq. and the following Legislative Rules promulgated thereunder:

- 2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation;*

2.4. Term and Renewal

- 2.4.1. This permit supersedes and replaces previously issued Permit R13-~~2290J~~2290K. This Permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any other applicable legislative rule;

2.5. Duty to Comply

- 2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Application R13-2290, R13-2290A, R13-2290B, R13-2290C, R13-2290D, R13-2290E, R13-2290F, R13-2290G, R13-2290H, R13-2290I, R13-2290J, R13-2290K, R13-2290L and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to;
[45CSR§§13-5.11 and 10.3.]
- 2.5.2. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA;
- 2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;
- 2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses, and/or approvals from other agencies; i.e., local, state, and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for administratively updating, modifying, revoking, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

4.0. Source-Specific Requirements

4.1. Limitations and Standards

4.1.1. The following conditions and requirements are specific to Boilers 1, 2, 3, and 4:

- a. The boilers shall be fired with pipeline quality natural gas at all times except when conducting periodic testing, and readiness checks of the boiler's ability to fire on liquid fuel (diesel); during periods of natural gas curtailment; or gas supply emergencies. The duration of such periodic testing and/or readiness check shall not exceed more than 48 hours per year for each boiler.
- b. CO emissions from emission point 1E shall not exceed an amount as calculated using the following equation.

$$EL_{CO} = \left(0.073 \frac{lb}{MMBtu} \times \sum HI_{gas} \right) + \left(0.037 \frac{lb}{MMBtu} \times \sum HI_{diesel} \right)$$

Where:

EL_{CO} = Emission Limit for CO, in terms of lb per hour.

HI_{gas} = Actual Heat Input from natural gas firing, in terms of MMBtu/hr

HI_{diesel} = Actual Heat Input from diesel firing, in terms of MMBtu/hr

- c. NO_x emissions from emission point 1E shall not exceed an amount as calculated using the following equation.

$$EL_{NOx} = \left(0.047 \frac{lb}{MMBtu} \times \sum HI_{gas} \right) + \left(0.19 \frac{lb}{MMBtu} \times \sum HI_{diesel} \right)$$

Where:

EL_{NOx} = Emission Limit for NO_x in terms of lb per hour.

HI_{gas} = Heat Input from natural gas firing, in terms of MMBtu/hr

HI_{diesel} = Heat Input from diesel firing, in terms of MMBtu/hr

- d. At all times when the boilers are operated solely with pipeline quality natural gas, the use of natural gas in these emission units satisfies compliance with the limitations of 45CSR§2-3.1., 45CSR§2-4.1.b., and 45CSR§10-3.1.e.
[45CSR§2A-3.1.a., 45CSR§10-10.3., and 45CSR§10A-3.1.b.]
- e. At all times when any of the affected emission units are operated on diesel or any combination of diesel and natural gas, Emission Point 1E shall not exhibit visible emissions greater than 10% opacity on a six minute block average. Compliance shall be verified in accordance with Condition 4.2.2. of this permit.
[45CSR§2-3.1.]
- f. Each boiler shall be designed or constructed with a maximum design heat input not to exceed the design capacity listed in Table 1.0 of this permit. Compliance with this limit shall be satisfied by limiting annual total heat input from all boilers to 510,182 MMBtu, measured as a rolling 12 month total.

4.1.2. The following conditions and requirements are specific to generator sets E-Gen 1S, EG-Gen Mobile, E-Gen 5, E-Gen 16, E-Gen Mobile 2, E-Gen Mobile 3, E-Gen 52:

- a. Each generator set shall be used ~~as an~~ **as an** emergency stationary generator and be limited to non-emergency operation of no more than 100 hours per year. Non-emergency operation shall be for maintenance checks and readiness tests. Emergency operation is defined when electric power from the local utility is interrupted.
[40 CFR §60.4211(f)]
 - b. Each generator set shall be equipped with an engine or engine configuration that has been certified by the manufacturer ~~to~~ **to** comply with either 40 CFR §60.4205(b)(2), which referred to 40 CFR §§89.111 and 112 or 40 CFR Part 60.
[40 CFR §§60.4211(a)(3) and (c)(1)]
 - c. The permittee shall maintain the engine of each generator set according to the manufacturer's emission-related written instructions.
[40 CFR §60.4211(a)(1)]
 - d. The permittee shall only change those emission-related settings of the generator sets that are permitted by the manufacturer.
[40 CFR §60.4211(a)(2)]
 - e. The maximum name plate power output of the engine for each generator set shall not be greater than listed in Table 1.0 of this permit.
 - f. Each engine will be equipped with a non-resettable hour meter.
- 4.1.3. Emissions from Emission Unit E-Gen 25 (Cummins Model NT855-G6 Generator Set) shall not exceed the maximum hourly and annual emission rates specified below:

Table 4.1.3. Emission Limits for E-Gen 25		
Pollutant	Maximum Emission Rates	
	(lb/hr)	(tons/yr)
NO _x	11.50	2.87
CO	0.74	0.18

- 4.1.4. Emission from Emission Unit E-Gen 23R (Caterpillar Model 3412 Generator Set) shall not exceed the maximum hourly and annual emission rates specified below:

Table 4.1.4. Emission Limits for E-Gen 23R		
Pollutant	Maximum Emission Rates	
	(lb/hr)	(tons/yr)
NO _x	11.97	2.99
CO	2.58	0.64

- 4.1.5. Emissions from Emission Unit E-Gen 3a (John Deere Model 6059T Generator Set) shall not exceed the maximum hourly and annual emission rates specified below: