



west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone: 304 926 0475 • FAX: 304 926 0479

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-1227C
Plant ID No.:	003-00019
Applicant:	West Virginia Air National Guard
Facility Name:	167 th TAG
Location:	Martinsburg
NAISC Code:	928110
Application Type:	Modification
Received Date:	January 7, 2014
Engineer Assigned:	Edward Andrews
Fee Amount:	\$1000.00
Date Received:	April 24, 2014
Completeness Date:	April 24, 2014
Due Date:	July 23, 2014
Newspaper:	<i>The Journal</i>
Applicant Ad Date:	April 19, 2014
UTMs:	Easting: 531.6 km Northing: 4,471.0 km Zone: 17
Description:	This modification is for the installation of two new jet fuel storage tanks and to cover several emergency engines at the facility.

DESCRIPTION OF PROCESS

West Virginia Air National Guard (WVANG) operates the 167th TAG out of the Martinsburg Air Base, which is adjacent to the Martinsburg Airport. To support tactical air operations as needed for national security purposes, the facility operates several emission sources to support these missions. Under Permit R13-1222B, the 167th TAG stored JP-8 (aviation fuel) in two 305,000 gallon storage tanks, which were installed in 1990.

Engineering Evaluation of R13-1227C
WVANG
167th TAG
Non-confidential

167th TAG replaced these tanks with new vessels with a storage capacity of 279,000 gallons. Each of these new vessels is equipped with an internal floating roof. The grade of the aviation fuel that is stored at the facility has changed to JP-A, which is very similar to JP-8.

Over the years the facility has added several emergency generators to provide back-up electrical service in the event of disruption of electrical service from the local utility operator. The following table is a list of these generators and the year of installation.

Table 1 – Emergency Generator List							
Source ID	Make	Model	Serial No.	Location	Engine Size (bhp)	Ignition Type	Year Installed
1	Liddy	MEP-009B	RZ00451	Bldg. 120	268	Compression	1992
2	Cummins	330G-FEB	EM05C073871	Bldg. 304	469	Spark	2005
4	Generac	929424240200	2096521	Bldg. 303	201	Spark	2008
5	Kohler	100REOZJE	2323271	Bldg. 136	134	Compression	2012
8	Kohler	30REOZJB	2136467	Bldg. 2001	40.2	Compression	2007
9	Kohler	100REOZJC	2137026	Bldg. 134	134	Compression	2006
10	Kohler	60ROZJ81	328133	Bldg. 139	80.5	Compression	1993
11	Kohler	60ROZJ81	326057	Bldg. 140	80.5	Compression	1992

SITE INSPECTION

The 167th TAG is considered an existing minor source and is subject to inspection by the agency. The agency has conducted several inspections over the years of this facility. The facility has been determined to be in compliance in the past 10 inspections. The most recent of these inspections took place on September 19, 2012, and was conducted by Mr. Joseph Kreger of the Eastern Panhandle Regional Office. Mr. Kreger conducted a “Full on Site” inspection of the air base and determined it to be operating within compliance of all applicable state and federal rules and regulations. Therefore, the writer determined that no site inspection of this facility is necessary for this permitting action.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The applicant estimated emissions from storage vessels and engines for the emergency generator sets.

Volatile Organic Liquid Storage

The facility had elected to replace the existing jet fuel storage and handling system at the Martinsburg Facility. The new vessels are internal floating roof tanks storing Jet-A (commercial aviation fuel), which is 90 to 100% kerosene with additives. The writer conducted several TANKS iterations to determine the VOC emissions and identify the main source of the loss (VOC emissions) from the vessels.

The application based the annual throughput for the tanks at 5.61 turnovers per tank (1,565,190 gallons per year) which yielded an annual VOC rate of 13.4 pounds per year. The main source of losses from the vessel was withdrawal losses of 9.8 pounds of the 13.4 pounds per year or withdrawal losses account for 73% of the VOC emissions from the tanks.

If the annual throughput was doubled or 11 turnovers per year (3,130,380 gallons per year), the VOC emissions was predicted to be 22.78 pounds per year per vessel. The withdrawal losses doubled, which was expected.

The facility transfers the Jet-A fuel from storage tanks into mobile tanker trucks. Assuming the total throughput of both vessels is transferred and using the splash loading emission factor from Table 5.2-5 of AP-42, the loading emissions from the tanker trucks was determined to be 125 pounds per year.

Stationary Combustion Engines

The installation has eight stationary engines that are used to drive generators to provide electrical power in the event of interruption of local electrical service. Two of these engines are spark ignition engines which are fueled with natural gas (EG2 and EG4). The remaining engines are compression ignition engines that are fueled with diesel. The applicant used the U.S. Air Force's 2009 Air Emissions Factor Guide to Air Force Stationary Sources to predict the emissions from these engines. The annual emissions were forecast on a maximum anticipated schedule of 500 hours per year. The writer reviewed the applicant's calculation and adjusted them for engines that were certified to meet the New Source Performance Standards (NSPS) using the manufacturer's emission data.

Pollutant\Sources	EG2 Cummins		EG4 Generac*	
	lb/hr	tpy	lb/hr	tpy
Oxides of Nitrogen (NO _x)	2.50	0.63	0.02	0.01
Carbon Monoxide (CO)	3.86	0.97	1.63	0.09

Fact Sheet R13-1227C
West Virginia Air National Guard
167th TAG - Martinsburg
Non-confidential

Volatile Organic Compounds (VOC)	0.03	0.001	0.11	0.001
Particulate Matter (PM)/ PM less than 10 microns (PM ₁₀)/ PM less than 2.5 microns (PM _{2.5})	0.01	0.01	0.03	0.01
Carbon Dioxide Equivalent (CO _{2e})	572.61	143.15	245.91	61.48
Total Hazardous Air Pollutants (HAPs)	0.13	0.03	0.06	0.015

* Engine certified to meet emission standards of NSPS Subpart JJJJ

Pollutant\Sources	EG1	EG5*	EG8*	EG9	EG10	EG11	Total
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	tpy
NO _x	8.31	0.91	0.68	4.87	2.49	2.49	4.94
CO	1.79	0.29	0.15	1.05	0.54	0.54	1.09
SO ₂	0.004	0.002	0.001	0.002	0.001	0.001	0.003
VOC	0.67	0.05	0.11	0.39	0.20	0.20	0.41
PM/PM ₁₀ /PM _{2.5}	0.59	0.01	0.04	0.35	0.18	0.18	0.34
CO _{2e}	199.80	183.87	65.03	183.87	112.62	112.62	402.53
Total HAPs	0.002	0.001	0.002	0.001	0.001	0.001	0.002

* Engine certified to meet emission standards of NSPS Subpart IIII

Pollutant	Permitted Limits Under R13-1227B (tpy)	Proposed Rates (tpy)	Net Change in Emissions (tpy)
PM/PM ₁₀ /PM _{2.5}	N/A	0.36	0.36
NO _x	N/A	5.58	5.58
CO	N/A	2.15	2.15
SO ₂	N/A	0.003	0.003
VOC	0.12	0.41	0.29
CO _{2e}	N/A	607.16	607.16
Total HAPs	N/A	0.05	0.05

REGULATORY APPLICABILITY

WV STATE RULES

There are no state rules that apply to the Jet-A storage vessels. The vapor pressure of Jet-A is 0.056 psia, which is less than the vapor pressure threshold that triggers controls under the New Source Performance Standards of Subpart Kb for Volatile Organic Liquid Storage Vessels to Part 60.

The generator sets are not considered a manufacturing source process under Rule 7 for particulate matter and Rule 10 for sulfur dioxide. The non-NSPS engines could potentially be subject to Subpart ZZZZ to Part 63, which regulates reciprocating internal combustion engines. This particular regulation excludes commercial and institutional emergency engines. For NAICS

Fact Sheet R13-1227C
West Virginia Air National Guard
167th TAG - Martinsburg
Non-confidential

Code of 928110 - National Security, EPA guidance document clarifying the definition of commercial and institutional use for the emergency engines notes it depends upon application. The following table identifies the engines that are potential affected sources and the application associated to the generator set.

Table - 5 Generator Application						
Source ID	Make	Model	Support Unit	Location	Similar NAICS Title	Classification*
1	Liddy	MEP-009B	Headquarter	Bldg. 120	Other General Government Support	Institutional
2	Cummins	330G-FEB	Tower	Bldg. 304	Air Traffic Control	Neither
9	Kohler	100REOZJC	Dinning Facility	Bldg. 134	Community Food Services	Institutional
10	Kohler	60ROZJ81	Motor Pool	Bldg. 139	General Automotive Repair	Commercial
11	Kohler	60ROZJ81	Aerospace Ground Equipment	Bldg. 140	Other Support Activities for Air Transportation	Neither

Classification – Either Institutional or Commercial

EPA guidance indicates that the activities associated with tower and aerospace ground equipment is not considered to be classified as either institutional or commercial. Thus, these engines would be subject to Subpart ZZZZ as existing emergency engines located at an area source of hazardous air pollutants, which are EG 2 and EG 11.

EG 2 is a spark-ignition engine less than 500 hp for emergency uses, which is subject to the work practice requirement of item 5 of Table 2d of Subpart ZZZZ to Part 63. EG11 is a compression ignition engine for emergency uses, which is subject to item 4 of Table 2d of Subpart ZZZZ to Part 63. This regulation does not establish any emission standard or control requirements for these engines other than the work practice requirements, which is limited to basic preventative maintenance services and inspections (i.e. oil changes, belt & hose inspection, air filter inspection, etc.). These requirements will be incorporated into the draft permit for these two engines.

This regulation deems that new engines located at an area source of hazardous air pollutants that are subject and compliant with the standards established in the New Source Performance Standard of Part 60 are not requirements that apply to such engines (See 40 CFR §63.6590(c) and (c)(1)).

Fact Sheet R13-1227C
 West Virginia Air National Guard
 167th TAG - Martinsburg
 Non-confidential

The engines for EG4, EG5, and EG8 are subject under the new source performance standards, which are Subparts IIII (compression ignition) and JJJJ (spark ignition). The manufacturers of these engines had certified the engines to meet the respective emission standard under these regulations. Other emission related requirements would apply to EG5 and EG8 that requires ultra-low sulfur be used, which is required by Subpart IIII. The facility currently uses this type of diesel in all of its compression ignition engines.

45CSR13 - Permits for Construction, Modification, Relocation and Operation of Stationary sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The facility has met the applicable requirements of this rule by publishing a Class I Legal Advertisement in *The Journal* on April 19, 2014, paid the \$1000.00 application fee, and submitted a complete permit application.

The facility is classified as a minor source (i.e. has PTE of < 100 TPY of PM and VOCs; <25 TPY of HAPs) concerning applicability under Title V (45CSR30). Thus, the facility will remain as a 9M source under 45 CSR 22.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The potential release of hazardous air pollutants from these sources is 0.05 tons per year, which is significantly below the Rule 13 trigger threshold of 2 pounds per hour or 5 tons per year. Therefore, no information about the toxicity of the HAPs is presented in this evaluation.

AIR QUALITY IMPACTS ANALYSIS

The writer deemed that an air dispersion modeling study or analysis was not necessary, because the proposed facility does not meet the definition of a major source as defined in 45CSR14.

MONITORING OF OPERATIONS

The VOC emissions from the storage are very insignificant with the use of the internal floating roof regardless of the throughput of Jet-A fuel, which is 148.8 pounds per year of VOCs from the tanks losses including transferring operations. Thus, it is recommended to focus compliance on ensuring the internal floating roof is properly maintained through an inspection process.

Compliance for the generators sets should be based on tracking hours of operation and for the NSPS engines, the purpose of operation. To demonstrate compliance with fuel specification of Subpart IIII, the permittee needs to document the type of diesel delivered to the facility.

Fact Sheet R13-1227C
West Virginia Air National Guard
167th TAG - Martinsburg
Non-confidential

CHANGES TO Permit R13-1272B

Permit R13-1227B was issued on October 16, 2003 under the out dated permit format. This permit covered the previous jet fuel storage tanks and loading racks. Compliance with the stated emission limits basically set fuel throughput restrictions on a daily and annual basis.

These conditions are no longer appropriate given the new vessels are equipped with internal floating roofs. Thus, these conditions will be replaced with the requirements to maintain the internal floating roof for each vessel.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates the proposed modification of the emission sources will meet all the requirements of the applicable rules and regulations when operated in accordance with the permit application. Therefore, the writer recommends granting the West Virginia Air National Guard a Rule 13 modification permit for the 167th TAG located in Martinsburg, WV.



Edward S. Andrews, P.E.
Engineer

Date: April 29, 2015

Fact Sheet R13-1227C
West Virginia Air National Guard
167th TAG - Martinsburg
Non-confidential