



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-2843A
Plant ID No.: 039-00611
Applicant: Dominion Transmission, Inc. (DTI)
Facility Name: Chelyan Compressor Station
Location: Cabin Creek, Kanawha County
SIC Code: 4922
Application Type: Modification
Received Date: February 10, 2011
Engineer Assigned: Jerry Williams, P.E.
Fee Amount: \$2,000.00
Date Received: February 10, 2011
Complete Date: February 28, 2011
Due Date: May 29, 2011
Applicant Ad Date: February 16, 2011
Newspaper: *Charleston Daily Mail*
UTM's: Easting: 456.104 km Northing: 4227.566 km Zone: 17
Lat/Long: 38.1949, -81.5013
Description: Modification of a natural gas compressor station consisting of changing the catalytic converter on the compressor engine, and replacement of the three (3) microturbines with one (1) auxiliary generator.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-2843A:

This permit modification application is to reflect minor changes from the original design for proposed sources to be operated at the Chelyan Compressor Station. The specific changes include the following:

1. The catalytic converter on the proposed compressor engine, denoted as 001-01, will be changed from a Miratech Corporation Model IQ-72Y3024x41-30-L4 Catalyst to a Vanec Model 141-30B-101-Element Catalyst. The natural gas compression engine will remain unchanged as a Caterpillar G3616LE, rated at 4,735 hp.

2. The three (3) proposed Capstone C64 Microturbines, denoted as 002-01, 002-02, 002-03 will not be constructed. Instead, an auxiliary generator is being proposed. The generator is a Waukesha Model VGF-H24GL, four stroke lean burn (4SLB) uncertified engine, rated at 528 hp. The generator will still be used as an emergency generator to provide power from the compressor station and will be limited to 500 hours per year of operation.

The Ajax Boiler, denoted as 003-01 will remain unchanged.

SITE INSPECTION

A site inspection was conducted on July 13, 2010 by the writer and Roy Kees. The facility had not been constructed at that time. The writer did not see any issues with the location of this facility.

Directions as given in the permit application are as follows:

From Charleston take I-64E/I-77S toward Beckley for approximately 15 miles. Take WV-61 exit toward US 60/Chelyan/Cedar Grove. Turn left on WV-61.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions were estimated using emission factors from engine manufacturer data and USEPA AP-42. Maximum controlled point source emissions from DTI's Chelyan Compressor Station are summarized in the table below.

Emission Point ID	Emission Unit ID	Process Unit	Pollutant	Maximum Controlled Emission Rate	
				Hourly (lb/hr)	Annual (ton/year)
EN01	001-01	Caterpillar G3616LE Compressor Engine 4,735 hp	Particulate Matter-10	0.01	0.01
			Sulfur Dioxide	0.02	0.08
			Nitrogen Oxides	5.21	22.86
			Carbon Monoxide	19.81	86.76
			Volatile Organic Compounds	3.29	14.40
			Formaldehyde	1.65	7.23
			Total Hazardous Air Pollutants	2.26	9.90

GE01	002-01	Waukesha VGF-H24GL Auxiliary Generator 528 hp	Particulate Matter-10	0.01	0.01
			Sulfur Dioxide	0.01	0.01
			Nitrogen Oxides	2.33	0.58
			Carbon Monoxide	1.51	0.38
			Volatile Organic Compounds	0.15	0.04
			Formaldehyde	0.20	0.05
			Total Hazardous Air Pollutants		
BR01	003-01	Ajax Boiler 3.0 MMBTU/hr	Particulate Matter-10	0.01	0.03
			Sulfur Dioxide	0.01	0.01
			Nitrogen Oxides	0.30	1.29
			Carbon Monoxide	0.25	1.09
			Volatile Organic Compounds	0.02	0.07
			Total Hazardous Air Pollutants	0.01	0.02
FUG	FUG	Fugitive Emissions	Volatile Organic Compounds	NA	3.84

The maximum emissions from the total facility are summarized in the following table:

Pollutant	Maximum Annual Emissions Before R13-2843A (tons/year)	Maximum Annual Emissions After R13-2843A (tons/year)	Maximum Annual Emissions Change (tons/year)
Particulate Matter-10	0.06	0.04	-0.02
Sulfur Dioxide	0.13	0.09	-0.04
Nitrogen Oxides	24.54	24.73	0.19
Carbon Monoxide	90.08	88.22	-1.86
Volatile Organic Compounds	32.78	18.35	-14.43
Formaldehyde	7.24	7.28	0.04
Total Hazardous Air Pollutants	10.25	10.31	0.06

The following table indicates the control device efficiencies that are required:

Emission Unit	Pollutant	Control Device	Control Efficiency
EN01, Compressor Engine	Carbon Dioxide	Catalytic Converter	31 %
	Volatile Organic Compounds		50 %

REGULATORY APPLICABILITY

The following rules apply to the facility:

45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers)

DTI would be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

45CSR4 (To Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors)

45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable. No odors have been deemed objectionable.

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)

45CSR13 applies to this source due to the fact that DTI exceeds the regulatory emission threshold for criteria pollutants of 6 lb/hr and 10 ton/year, and DTI is subject to a substantive requirement of an emission control promulgated by the Secretary.

45CSR16 (Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60)

45CSR16 applies to this source by reference of 40CFR60 Subpart JJJJ. DTI is subject to the recordkeeping, monitoring, and testing required by 40CFR60 Subpart JJJJ.

45CSR22 (Air Quality Management Fee Program)

DTI is not subject to 45CSR30. Therefore, they are a nonmajor source that is required to submit the appropriate fees listed in 45CSR22 and to keep their Certificate to Operate (CTO) current.

40CFR60 Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines)

DTI's compressor engine (EN01) is subject to 40CFR60 Subpart JJJJ, which sets forth emission limits, fuel requirements, installation requirements, and monitoring requirements based on the year of installation of the subject internal combustion engine. 40CFR60 Subpart JJJJ is applicable to owners and operators of engines with a maximum engine power greater than 500 hp for engines manufactured on or after July 1, 2007. The emission limits for the subject engine (EN01) are the following: NO_x – 2.0 g/hp-hr (10.44 lb/hr); CO – 2.0 g/hp-hr (20.88 lb/hr); and VOC – 0.7 g/hp-hr (7.31 lb/hr).

DTI's auxiliary generator (GE01) is subject to 40CFR60 Subpart JJJJ, which sets forth emission limits, fuel requirements, installation requirements, and monitoring requirements based on the year of installation of the subject internal combustion engine. 40CFR60 Subpart JJJJ is applicable to owners and operators of new emergency engines manufactured after January 1, 2009. The emission limits for the subject engine (GE01) are the following: NO_x – 2.0 g/hp-hr (2.33 lb/hr); CO – 4.0 g/hp-hr (4.66 lb/hr); and VOC – 1.0 g/hp-hr (1.16 lb/hr).

Based on the manufacturer's specifications for these engines, the emission standards will be met. Because the engines will not be certified by the manufacturer, DTI will be required to perform an initial performance test within 180 days from startup, and subsequent testing every 8,760 hours or 3 years, whichever comes first.

The following regulations do not apply to the facility:

45CSR14 (Permits for Construction and Modification of Major Sources of Air Pollution for the Prevention of Significant Deterioration)

The modification of the Chelyan Compressor Station does not constitute a major source under 45CSR14. The potential emissions associated with the Chelyan Compressor Station are less than the amounts (250 tpy) set forth in 45CSR14. Therefore, the facility is not a major source under 45CSR14.

40CFR60 Subpart Dc (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units)

The proposed boiler that DTI will install has a maximum design heat input less than 10 MMBTU/hr. Therefore, DTI is not subject to this rule.

The following regulations may apply to the facility:

40CFR63 Subpart ZZZZ (National Emission Standards for Reciprocating Ignition Internal Combustion Engines)

40CFR63 Subpart HH (National Emission Standards for Hazardous Air Pollutants: Oil and Natural Gas Production and National Emission Standards for Hazardous Air Pollutants: Natural Gas Transmission and Storage)

40CFR63 Subpart HHH (National Emission Standards for Hazardous Air Pollutants: Natural Gas Transmission and Storage)

WVDEP DAQ did not determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart HH and 40 CFR 63, Subpart ZZZZ.

These promulgated national emission standards for hazardous air pollutants (NESHAP) limit emissions of hazardous air pollutants (HAP) from oil and natural gas production and natural gas transmission and storage facilities. These final rules implement section 112 of the Clean Air Act (Act) and are based on the Administrator's determination that oil and natural gas production and natural gas transmission and storage facilities emit HAP identified on the EPA's list of 188 HAPs.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas. However, due to the concentrations emitted, detailed toxicological information is not included in this evaluation.

AIR QUALITY IMPACT ANALYSIS

The changes to this facility do not constitute a major source under 45CSR14. Based on the nature of the emissions and the annual emission rate, no air quality analysis was performed. However, air dispersion modeling will be required if the Director finds existing circumstances and/or submitted data that provide cause for an assessment to be made concerning whether this facility may interfere with attainment or maintenance of an applicable ambient air quality standard or cause or contribute to a violation of an applicable air quality increment.

MONITORING OF OPERATIONS

DTI will be required to perform the following monitoring:

1. Monitor and record quantity of natural gas consumed for all combustion sources.

DTI will be required to perform the following recordkeeping:

1. Maintain records of the amount of natural gas consumed in each combustion source.
2. Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
3. Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
4. Maintain records of the visible emission opacity tests conducted per the permit.
5. Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.
6. The records shall be maintained on site or in a readily available off-site location maintained by DTI for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates DTI's Chelyan Compressor Station meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Kanawha County location should be granted a 45CSR13 modification permit for their facility.

Jerry Williams, P.E.
Engineer

Date