west virginia department of environmental protection

Division of Air Quality
601 57th Street, SE
Charleston, WV 25304-2345
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

B ACKGROUND INFORMATION

Application No.:	R13-2837C
Plant ID No.:	041-00011
Applicant:	Dominion Transmission Inc.
Facility Name:	Kennedy Compressor Station
Location:	Valley Chapel
NAICS Code:	486210
Application Type:	Modification
Received Date:	November 19, 2012
Engineer Assigned:	Edward S. Andrews, P.E.
Fee Amount:	$1000.00
Fee Deposit Date:	November 21, 2012
Complete Date:	December 19, 2012
Due Date:	March 19, 2012
Applicant Ad Date:	November 14, 2012
Newspaper:	*The Weston Democrat*
UTM's:	Easting: 543.6 km Northing: 4,328.7 km Zone: 17
Description:	The application is for the installation of an oxidation catalyst on compressor engine #3 (EN03).

FINDING OF FACT

The Kennedy Station is a transmission compressor station that services a natural gas pipeline system. Currently compressor engines (EN03 and EN04) at the facility receive natural gas from a pipeline and compresses it to increase the pressure of the natural gas stream. The EN03 will have a DCL America catalytic converter (oxidation catalyst) to reduce emissions of carbon monoxide (CO).

The compressed natural gas stream is then sent to an existing Cameron triethylene glycol (TEG) dehydration unit to reduce the moisture content of the natural gas stream. The process to remove the moisture begins with the compressed natural gas stream flowing countercurrent to lean TEG in the contactor bed. The contactor bed is rated for 23 million standard cubic feet per

day (mmscfd). Once the compressed dehydrated natural gas comes out of the contactor bed it is then sent to the pipeline. In the contactor bed the lean TEG absorbs water and hydrocarbons from the compressed wet natural gas. The TEG, which has become rich with absorbed moisture and hydrocarbons, is sent to the regenerator. The heat generated from the natural gas fired reboiler (RBR01) is used to liberate the moisture and hydrocarbons from the rich TEG in the regenerator. The reboiler has a 1.104 million British Thermal Units per hour (mmBTU/hr) capacity. The regenerator vapors exit the still vent to the Questor Technology, Inc. Model 100 Flare (F2) that combusts most of the hydrocarbons reducing VOC and HAP emissions and odor. The flare has a 4.0 MMBTU/hr capacity.

SITE INSPECTION

A full on-site inspection was last performed by the WVDAQ on June 3, 2009. On that date Mike Kolb found the facility to be "in compliance."

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The scope of this particular request is to install an oxidation catalyst on engine EN03 to be capable of meeting the emission and operating limitations of the National Emission Standard for Hazardous Air Pollutants (NESHAPs) for Reciprocating Internal Combustion Engines (RICE). Dominion has proposed to install an oxidation catalyst manufactured by DCL America to meet the applicable CO limit of 47 ppmvd at 15% oxygen content (O_2). The catalyst manufacturer determined that mass rate for CO would be 0.5 pounds per hour from this particular application. This catalyst would have the potential to reduce CO emissions from engine EN003 by nearly 18 tons per year (tpy).

The following table represents the proposed estimated total facility emissions before and after the proposed changes has been implemented:

Table #1 Emission Changes at the Kennedy Station		
Pollutant	Emission (Before) (tpy)	Emission (After) (tpy)
Oxides of Nitrogen (NO_x)	26.4	26.4
Carbon Monoxide (CO)	41.7	23.9
Volatile Organic Compounds (VOCs)	85.2	85.2
Particulate Matter (PM)/ Particulate Matter less than 10 microns (PM_{10})/ Particulate Matter less than 2.5 microns ($PM_{2.5}$)	0.8	0.8
Total Hazardous Air Pollutants (HAPs)	9.0	9.0

REGULATORY APPLICABLILITY

Dominion Transmission has submitted this proposed modification to take credit for the CO reduction in a federally enforceable document. With the existing changes made as proposed in Permit Application R13-2837B, the Kennedy Station does not have the potential to emit more than 100 tpy of a single new source review pollutant, which makes the source non-major (i.e. minor source). Thus, Dominion does not need to obtain a Title V Operating Permit.

This proposed change does not require a Rule 13 modification permit to be implemented. Under the definition of "modification" under 45 CSR §13-2.17.f.1., states that the installation or replacement of air pollutant control equipment does not constitute a modification of a stationary source. Regardless, the applicant filed a complete permit application, paid the required filing fee, and published a legal ad in accordance with 45 CSR 13.

The station is classified as an area source of HAPs and operates a RICE on a continuous basis at the facility. Only engine EN03 is subject to limitation under the RICE MACT (Subpart ZZZZ). The other RICEs at the station are subject to requirements of the New Source Performance Standard (NSPS) Subpart JJJJ and that Subpart ZZZZ exclude RICEs that are subject to Subpart JJJJ that are located at an area source of HAPs(See 40 CFR §63.6590(c)(1).

Engine EN03 is a four stroke, lean burn (4SLB) RICE which was installed at the station in 2004. Thus, engine EN03 is a affected source subject to this subpart (See 40 CFR §63.6590(a)(1)(iii) as an existing source. According to 40 CFR §63.6595(a), the applicant has until October 19, 2013to bring the existing engine into compliance with the application emission standard of the subpart.

The applicable emission and limitation standards for engine EN03 are as follows:

- Reduce CO emissions to a concentration of 47 ppmvd (Item 8 of Table 2d to Subpart ZZZZ of Part 63, 40 CFR§63.6603(a))
- The exhaust temperature entering the catalyst must be maintained between 450^0F and 1350^0F (Item 1 of Table 2b to Subpart ZZZZ of Part 63, 40 CFR§63.6603(a))
- The pressure drop across the catalyst cannot change more than 2 in of water column ($\pm$ 10%) from the pressure measured during the initial performance test.

The subpart requires the applicant to demonstrate compliance with this emission limitation and established the pressure drop readings during an initial compliance test (40 CFR §63.6612(a)). Subsequent testing shall be conducted every 8,760 hours of operation or once every 3years, whichever comes first (40 CFR §63.6615).

As noted in Engineering Evaluation of R13-2837B, the station is not subject to 40 CSR 30 and this proposed change does not affect this prior determination. There are no other

application rules or regulations that are applicable to this change. The Kennedy Station remains as an "8D" source under Rule 22.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The proposed add on controls (catalyst) to engine EN03 will not emit any pollutants that aren't already being emitted by another emission source at the facility. Therefore, no information about the toxicity of the hazardous air pollutants (HAPs) is presented in this evaluation.

AIR QUALITY IMPACT ANALYSIS

Based on the annual emission rates, this facility will not be a major source as defined by 45CSR14, so air quality modeling was not required.

MONITORING OF OPERATIONS

The RICE rule (40CFR63, Subpart ZZZZ) has specific monitoring requirements, which require monitoring exhaust temperature at the inlet of the catalyst and pressure drop across the catalyst. Dominion will be required to conduct an initial compliance demonstration, which will be used to establish these parameters. Subsequent testing frequency is based on actual hour of operating and therefore needs to be monitor as well.

CHANGES TO PERMIT R13-2837B

The model number of engine EN03 needs to be corrected in Table 1.0. The flare at the station is a non-assisted flare. Therefore, item h. of condition 4.1.4. was omitted since they do not pertain to the actual flare at the station (item h was for air assisted flares). Item f. of condition 4.1.4.was omitted because it is not possible for the effluent generator at this facility to have a heat content of 1000 Btu/scf or greater. The heat content of effluent in Application R13-2837A was determined to be 207 Btu/scf. The specific emission and operating limitations of the RICE MACT and testing will be incorporated into the permit as well.

Upon request by the New Source Program Manager, a NO_x limit was established based on engine's potential to emit and incorporated into the permit to ensure that the facility is not a major source (limits the potential to emit below 100 tpy). Manufacturer's data on NO_x emissions being generated by this particular model engine was available in the application, which was 1.5 grams of NO_x per bhp-hr. This equated to an hourly NO_x limit of 3.8 pounds per hour, which equates to annual limit of 16.6 tpy. These NO_x limits were incorporated into Condition 4.1.7., which result in a numbering change with the conditions below this.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that the Kennedy Station should meet applicable requirements of state rules and federal regulations. It is recommended that Dominion Transmission, Inc. be granted a 45CSR13 modification permit for the proposed changes to Kennedy Compressor Station.

Edward S. Andrews, P.E.
Engineer

February 6, 2013
Date