TECHNICAL REVIEW DOCUMENT
for
OPERATING PERMIT 95OPWE020

to be issued to:

Duke Energy Field Services, Inc
Marla Compressor Station
Weld County
Source ID 1230243

Prepared by Michael E. Jensen
March 8, 1999

I. PURPOSE:

This document establishes the basis for decisions made regarding the Applicable Requirements, Emission Factors, Monitoring Plan and Compliance Status of Emission Units covered within the Operating Permit proposed for this site. It is designed for reference during review of the proposed permit by the EPA and during Public Comment. This narrative is intended only as an adjunct for the reviewer and has no legal standing. Conclusions in this document are based on information provided in the original application submittal of January 18, 1995, a supplemental Title V technical information submittal of February 14, 1997, as well as numerous technical information submittals needed for the preparation of the construction permit(s), as well as numerous telephone contacts with the applicant.

On April 16, 1998, the Colorado Air Quality Control Commission directed the Division to implement new procedures regarding the use of short term emission and production/throughput limits on Construction Permits. These procedures are being directly implemented in all Operating Permits that had not started their Public Comment period as of April 16, 1998. All short term emission and production/throughput limits that appeared in the Construction Permits associated with this facility that are not required by a specific State or Federal standard or by the above referenced Division procedures have been deleted and all annual emission and production/throughput limits converted to a rolling twelve (12) month total. Note that, if applicable, appropriate modeling to demonstrate compliance with the National Ambient Air Quality Standards was conducted as part of the Construction Permit processing procedures. If required by this permit, portable monitoring results and/or EPA reference test method results will be multiplied by 8760 hours for comparison to annual emission limits unless there is a specific condition in the permit restricting the hours of operation.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such

revisions, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised Construction Permit.

II. Source Description:

This plant is classified as a natural gas compressor station on a gas transmission line as set forth under Standard Industrial Classification 4922. The plant uses three (3) gas-fired internal combustion engines to drive compressors to transmit natural gas gathered from gas field laterals to a primary pipeline. All three (3) engines have individual stacks to vent the products of combustion.

The station also includes two triethylene glycol dehydrator units which contact "dry" triethylene glycol with the natural gas stream to remove moisture. The "wet" glycol mixture is regenerated in a still for reuse in the process. Water vapor and entrained volatile organic compounds are emitted through the still vent. Combustion emission from the heater portion of the still are vented through a separate stack.

Other equipment on-site includes two (2) 5 MMBtu/hr natural gas fired glycol reboilers and four (4) 300 barrel capacity condensate storage tanks. The condensate tanks store a mixture of hydrocarbon liquids and water separated from the inlet gas stream by separation and scrubbing vessels. The condensate is loaded onto trucks for transport to another location for processing.

The plant is located in rural Weld County south of Kersey, Colorado. The area in which the plant operates is designated as attainment for all criteria pollutants. Wyoming is an affected state within 50 miles of the plant. Rocky Mountain National Park is a Federal Class I designated area within 100 kilometers of the plant.

Construction Permit 97WE0452 set the Potential To Emit (PTE) for the entire plant as follows:

Pollutant	Potential to Emit (tpy)	Actuals (tpy)
NOx	85.63	85.64
VOC	179.24	179.22
CO	128.45	128.48
HAPs	---	48.04

The potential emissions are limited by the conditions in Construction Permit 97WE0452 at a level that classifies this source as a synthetic minor with respect to Prevention of Significant Deterioration (PSD) requirements. The estimated actual emissions are from the Division database for calendar year 1997 and are slightly different due to the rounding of values by the different computer calculation procedures.

At the time the Title V application was submitted the permittee submitted APENs and construction permit applications for all the sources at the plant. The documents were submitted to update, revise, or correct existing construction permits as necessary, or request a new construction permit. Further, the permittee requested a single permit be issued for the entire plant, rather than for each individual source.

The Final Approval for Construction Permit 97WE0452 had not been issued at the time this operating permit was prepared. The Construction Permit required compliance testing for all the engines. The testing has not been completed. The due date of the first semi-annual monitoring report required by this operating permit will be more than 180 days after the initial approval construction permit was issued and the equipment commenced operation.

The new Construction Permit required the submittal of a compliance plan for all the sources. The Division accepts the monitoring proposal provided in the Title V application as the submittal of the compliance plan required by the Construction Permit. In the discussion in the following sections, the Division considers the Responsible Official certification submitted with the semi-annual report will serve as the self-certification for Construction Permit 97WE0452. The appropriate provisions of the Construction Permit have been directly incorporated into this operating permit.

The Division accepts the responsible official signature of the Title V application as evidence of compliance for all the sources at the plant at the time the Title V application was submitted.

After the Title V application had been submitted the permittee requested a modification of the alternative operating scenario. The permittee wanted less restrictions on the requirements whenever an engine was replaced. An extended dialogue between the Division and the permittee developed standard language to be used.

The magnitude and the nature of the discrepancies between the existing construction permits and the information submitted with the Title V application would have precluded the Division from accepting the facility was in compliance at the time the operating permit application was submitted. A Compliance Order on Consent, last signed on January 8, 1999, noted Duke had reported “like-kind” replacement of some of the engines without the submitting APENs or obtaining construction permits. The Division accepts the signing of the Order as evidence the facility is currently in compliance.

III. EMISSION SOURCES:

The following sources are specifically regulated under terms and conditions of the Operating Permit for this plant:

Internal Combustion Engines Powering Compressors
P101 - Waukesha L-7042 GSI 1478 HP w/ NSCR
P102 - Waukesha L-7042 GSI 1478 HP w/ NSCR
P103 - Waukesha L-7042 GSI 1478 HP w/ NSCR

1. Applicable Requirements: Construction Permit 97WE0452 was issued after the Title V permit application was submitted and is being directly incorporated into this operating permit. The Construction Permit set pollutant limits for the total plant, commonly known as 'bubble limits', as well as limits for individual pieces of equipment.

The engines are required to demonstrate compliance by stack tests to be conducted within 180 calendar days of the issuance of the operating permit if the stack tests have not already been completed.

Form 2000-604, Item 10, of the Title V application states that emissions of natural gas from compressor engine blowdown during maintenance and during engine start-up qualifies as an insignificant source. The statement continues that emission limits do not apply during the first ½ hour of operation after a cold start. The Division agrees that if calculations to estimate the emissions released are below the APEN threshold when the maintenance blowdown and engine startup are limited to ½ hour, this activity may be considered an insignificant activity. Records will have to be maintained to demonstrate that these activities are performed in less than ½ hour. The permittee could not cite a regulatory basis for the startup statement. The Division does not accept that there is such a provision.

2. Emission Factors: Emissions from reciprocating engines are produced during the combustion process, and are dependent upon the fuel mixture, engine design specifications, and specific properties of the natural gas being burned. The pollutants of concern are Nitrogen Oxides (NOx), Carbon Monoxide (CO) and Volatile Organic Compounds (VOC). Small quantities of Hazardous Air Pollutants (HAPs) are also emitted when combustion is incomplete. Approval of emission factors for use with engines is necessary to the extent that accurate actual emissions are required to verify the need to submit Revised APENs to update the Division emission inventory, and for compliance determination and certification. Construction permit 97WE0452 required compliance testing to be performed on the engines to validate the proposed emission factors. At the time of the preparation of this operating permit the compliance testing had not been completed.

In preparing the Operating Permit it was discovered that while Construction Permit 97WE0452 reported a fuel heat value of 1040 Btu per standard cubic foot which was used in the calculations, the actual value was 958 Btu per standard cubic foot. This correction was made in the Operating Permit information.

3. Monitoring Plan: The operating permit established a procedure for the calculation of the emissions based on fuel consumption and a fuel based emission factor. The fuel consumption is determined by prorating the total monthly fuel use based on the operating hours for each engine for the month. The emissions are to be calculated monthly to determine compliance with annual (12-month rolling total) limit. A Revised APEN must be submitted to the Division if criteria emissions increase by more than 50 tons per year or 5%, whichever is less, compared to the latest APEN on file with the Division.

A copy of a monitoring guidance grid developed by the Division is included at the end of this document. The grid and the Title V application monitoring proposals were used to define the monitoring requirements for the internal combustion engines. The Division monitoring guidance grid requires more intensive and extensive monitoring of the emissions from internal combustion engines when an engine is equipped with an emissions control. A small decrease in the control efficiency can result in significant increases in the emissions released. Increased monitoring is necessary to ensure that the control devices are functioning properly.

The Division has determined, based on AP-42 emission factors and engineering judgement, that particulate emissions from these type of internal combustion engines will be insignificant if natural gas is exclusively used as the fuel. The use of natural gas will also satisfy the opacity monitoring requirement.

A properly functioning Non-Selective Catalytic Reduction (NSCR) unit will demonstrate a heat rise across the unit as a result of the oxidation, destruction or conversion of the air pollutants. The media deteriorates with time and needs to be replaced or regenerated. Particulate matter from the engine can be trapped in the catalytic material and lead to an increase in the pressure drop across the control device. The accidental backfire of an engine can result in the loss or destruction of the media. The monitoring plan provides reasonable evidence of the presence and functioning of the catalytic media.

4. Compliance Status: The equipment at this site has been operating for an extended time. A current APEN reporting criteria emissions is on file with the Division. Duke certified in the application that natural gas has been used exclusively as the fuel for this unit. As noted previously, the Division accepts the compliance signature of the responsible official as evidence of compliance.

One Triethylene Glycol Regeneration Unit w/ Flash Tank
One Triethylene Glycol Regeneration Unit w/o Flash Tank

1. Applicable Requirements: Construction Permit 97WE0452 established the emission and throughput limits for these units. A future Maximum Available Control Technology (MACT) standard is being developed by the US Environmental Protection Agency for operations at oil and gas facilities. The MACT will most likely contain provisions for certain glycol dehydration units, triggered by the daily gas throughput rate. Until such time as the MACT rule is promulgated, no control requirements exist for this point.

2. Emission Factors: Triethylene glycol is contacted with the natural gas stream to remove moisture. This mixture is heated in the still portion of the unit to drive off the water. Some volatile organic compounds and hazardous air pollutants are also released with the water vapor. Emissions from this process are typically measured with a glycol analysis (rich/lean analysis) or predicted using the Gas Research Institute's (GRI) computer software model GLYCalc. The model uses input values for the glycol recirculation rate, cubic feet of gas processed, desired moisture content (dew point) for the processed gas, and the amounts of various constituents in the natural gas in an algorithm to estimate VOC and HAP emissions.

The Division accepts the use of the GLYCalc model to estimate emissions in lieu of rich/lean testing. At least once a month the parametric inputs for the GLYCalc model will be recorded. The record of the input parameters will provide a perspective on the range of the input values over time. The perspective developed will allow consideration of whether more frequent testing is needed for a better estimation of the results. An extended gas analysis will be performed at least once each calendar year as long as a consistent gas quality exists. The analysis will revert to a quarterly frequency if fluctuations in the gas quality are detected. Each calendar quarter the GLYCalc model will be used to estimate the emissions based on the parametric inputs and extended gas analysis.

Combustion emissions from the heater are exhausted through a stack separate from the still vent. This heaters are rated at 5 million Btu/hr and fall under the insignificant activity category of Colorado Regulation No. 3, Part C, Section II.E.3.k. As an insignificant activity the heater emissions do not need to be addressed directly by this Operating Permit.

3. Monitoring Plan: The monitoring requirements were established from Construction Permit 97WE0452, the Division guidance grid included at the end of this document, and the monitoring information provided in the Title V application.

Input parameters from the dehydrator for the GRI GLYCalc model will be recorded for at least once per month. Each calendar month the newest version of the GRI GLYCalc computer model will be used to estimate the annual emissions of VOC and HAPs. The permittee provided information that

demonstrated a consistent gas quality. On the basis of the information provided, an annual gas analysis will be required. If the gas quality becomes inconsistent the testing frequency will revert to a quarterly frequency. Recording the values of model input parameters monthly allows the variability in the parameters to be followed.

A Revised APEN is required if a significant increase of VOC or HAPs occur as defined in Colorado Regulation No. 3, Part A, Section II.C.2. compared to the APEN currently on file with the Division.

4. Compliance Status:: The equipment at this site has been operating for an extended time. A current APEN reporting criteria emissions is on file with the Division. Duke certified in the application that natural gas has been used exclusively as the fuel for this unit. As noted previously, the Division accepts the compliance signature of the responsible official as evidence of compliance.

Fugitive Emissions of Volatile Organic Compounds from Equipment Leaks

1. Applicable Requirements: The Division has made the determination that fugitive VOC emissions from equipment leaks at gas compression or processing facilities must be calculated and evaluated for the appropriate permitting requirements. The piping and equipment at the facility is not currently subject to the Subpart KKK leak testing requirements.

2. Emission Factors: The fugitive leak emissions are calculated based on emission factors from EPA's Protocol for Emission Leak Estimates. These factors have changed several times in the recent past. The factors used were current at the time the construction permit was prepared. The EPA factors estimate the total organic compounds. The factors are multiplied by the number of components of each type (e.g. compressor seals, flanges, etc) and the VOC weight percentage in the gas stream as determined in the most recent gas analysis.

The details and actions required for leak testing and repair of the piping and equipment are to be set forth in the document required for the leaking testing program.

3. Monitoring Plan: Equipment and piping modifications at a facility are an on-going process. Sufficient time has lapsed since the Construction Permit component count was performed for modifications to have changed the component count. The permittee must perform an initial count of the components within 90 days of the issuance of the Operating Permit. The permittee is then required to maintain a running tally of the component count in order to perform the fugitive leak emissions estimate. The count must be re-established in order to provide the correct base for the running tally. An actual physical count of the number of process valves, relief valves, pump seals, compressor seals and flanges/connections is to be performed at least once every five (5) years to verify the tally has been correctly and currently maintained. A 50% or 5 ton per year increase in

criteria pollutant emissions, whichever is less, will necessitate the need for submittal of a Revised APEN.

4. Compliance Status: The equipment at this site has been operating for an extended time. A current APEN reporting criteria emissions is on file with the Division. Duke Energy certified in the application that natural gas has been used exclusively as the fuel for this unit. As noted above, the Division accepts the compliance signature of the responsible official as evidence of compliance.

Insignificant Activities

The permittee needs to periodically review the insignificant activities to determine if they are still insignificant and in compliance with all applicable requirements. A record of review, the compliance determination, and any additions, deletions or changes to the insignificant source inventory should be maintained. The record will support the annual compliance certification for the insignificant sources. The inventory of insignificant sources provided in the permit application is included in Appendix A of the operating permit as a starting reference.

The Division's has some previous experience with purging/venting procedures during the startup and shutdown of compressor engines similar in size to the ones in this permit. The Division has generally found the engine dimensions and the presumption of a 20% VOC content in the gas stream results in the VOC emissions being less than two (2) tons per year. Since this estimated value is below the APEN reporting threshold established in Colorado Regulation 3 the Division concludes that these emissions are insignificant. The permittee needs to maintain records to demonstrate the maintenance and startup blowdown procedures do not require more than 30 minutes.

The four (4) 300 barrel condensate storage tanks are eligible candidates for construction permit because they satisfy the applicability provisions of 40 CFR Part 60 Subpart Kb based on capacity and installation date. The tanks are, however, exempt from Subpart Kb, based on §60.110.b.d.4 which states "Vessels with a design capacity of less than or equal to 1,589.874 m^3 used for petroleum or condensate stored, processed, or treated prior to custody transfer." Each tank has a capacity of 47.70 m^3 and is used for storage prior to custody transfer.

Alternative Operating Scenario

Engine Replacement

The permittee requested that both temporary and permanent replacements of the internal combustion engines be considered an Alternative Operating Scenario. A temporary engine would operate for less than 3 months in the same service while an existing engine was being repaired or overhauled. The Division acceptance of the operation of either a temporary or permanent engine is contingent upon emissions testing of the engine to demonstrate the emissions comply with the permit limits. Testing must be conducted under representative conditions for the engine being replaced. The permittee must be willing to accept a determination of non-compliance should the emissions testing determine the emissions from the engine in question exceed those defined in the Operating Permit. Any non-compliance will be considered to exist from the day the replacement engine started operation.

Hazardous Air Pollutants

The applicable requirement is for the reporting of estimated emissions above the appropriate bin thresholds established in Appendix D of Regulation No. 3. Hazardous air pollutant emissions for each source are estimated from manufacturer's information, AP-42 and GRI technical reports. A Revised APEN must be submitted when there is an increase in hazardous air pollutants of 50 percent (%) or five (5) tons per year, whichever is less, above the level of the last APEN submitted. The Division accepts this source was in compliance at the time the Title V application was submitted.

Permit Shield

The intent of the permit shield is to provide limited protection to the plant in the event of an error in the evaluation of whether a regulation, or portion of a regulation applies. The plant identifies the issue and presents its position. The Division reviews the position. If the Division and the plant mutually agree on the position, the issue is recorded in the permit. If, at a later date, it is determined that an error was made in the mutual decision, the plant is protected from enforcement action until the permit can be reopened and the correct requirements and a compliance schedule inserted.

In this application, an extensive list of non-applicable sections of the Federal and State regulations are identified for the sources, and the request for the shield justified.

Miscellaneous

From time to time published emission factors are changed based on new or improved data. A logical concern is what happens if the use of the new emission factor in a calculation results in a source being out of compliance with a permit limit. For this operating permit, the emission factors or emission factor equations included in the permit are considered to be fixed until changed by the permit. Obviously, factors dependent on the fuel sulfur content or heat content can not be fixed and will vary with the test results. The formula for determining the emission factors is, however, fixed. It is the responsibility of the permittee to be aware of changes in the factors, and to notify the Division in writing of impacts on the permit requirements when there is a change in factors. Upon notification, the Division will work with the permittee to address the situation.

Short Term Limits

As noted at the start of this review document, new procedures resulted in the removal of short term emission and production/throughput limits from Construction Permits. The table below documents existing short term Construction Permit limits that were not incorporated in the Operating Permit.

Construction Permit	Emission Point	NOx, lb/hr	CO, lb/hr	VOC, lb/hr	Fuel Use or Process rate
97WE0452	P102; P103; P104 - 1478 HP Engine	6.52	9.78	1.63	11,576 scf/hr
	P101 - TEG Dehydrator			17.48	417,000 scf/hr and 1.19 gpm recirculation rate
	P105 - TEG Dehydrator			15.45	417,000 scf/hr and 1.10 gpm recirculation rate
	Fugitive VOC Equipment Leaks			1.48	
	Total Station Emissions	19.56	29.34	52.99	