

Air Quality Standard Permit for Natural Gas Electric Generating Units
Texas Commission on Environmental Quality
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I. Executive Summary

The Texas Commission on Environmental Quality (TCEQ or commission) is seeking to issue a non-rule air quality standard permit for natural gas fired electric generating units (EGUs) that generate electricity for use by the owner or operator and/or generate electricity to be sold to the electric grid. The proposed standard permit would provide applicants with more flexibility when seeking authorization of natural gas EGUs at a site and serves as an alternative option to the existing Non-Rule Air Quality Standard Permit for Electric Generating Units. The new standard permit is authorized by the Texas Clean Air Act (TCAA), Texas Health and Safety Code (THSC) Chapter 382 and is based on a comprehensive evaluation of air emissions and potential impacts.

II. Explanation and Background of Air Quality Standard Permit

The commission is seeking to issue an air quality standard permit authorizing EGUs firing natural gas under the authority of THSC §382.05195, Standard Permit, and Title 30 Texas Administrative Code (30 TAC) Chapter 116, Subchapter F, Standard Permits.

The proposed standard permit would provide a preconstruction authorization that may be used by any natural gas fired EGU complying with the standard permit requirements provided the natural gas (NG) EGU is not prohibited by other local, state, or federal permitting statutes or regulations. The existing Non-Rule Air Quality Standard Permit for Electric Generating Units is more frequently used by EGUs using fuel sources other than natural gas, such as diesel. The new standard permit would provide applicants with more flexibility when seeking authorization of NG EGUs at a site and serves as an alternative option to the existing Non-Rule Air Quality Standard Permit for Electric Generating Units. However, it is not intended to provide an authorization mechanism for all possible unit configurations or for unusual operating scenarios. Owners or operators of those potential facilities that cannot meet the standard permit conditions may apply for a case-by-case review of an air quality permit under 30 TAC §116.111 or other authorization mechanism.

III. Overview of Air Quality Standard Permit

The new proposed standard permit would authorize NG EGUs used to generate electricity for use by the owner or operator, and/or generate electricity to be sold to the electric grid. The standard permit would only be applicable to spark-ignited internal combustion engines that fire natural gas and excludes boilers and turbines. It would include operating specifications and emission limitations for typical natural gas engines during routine operation and planned maintenance, startup, and shutdown (MSS). The standard permit can be used to reauthorize existing engines authorized under Permit by Rule (PBR) or the existing EGU standard permit, provided that the entire engine is reauthorized under the NG EGU standard permit. The standard permit cannot be used to modify existing engines authorized under 30 TAC Chapter 116 Subchapter B, Subchapter C, or Subchapter G.

The standard permit analysis is required by statute to include Best Available Control Technology (BACT) for each source. BACT is defined in 30 TAC §116.10(1) as an air pollution control method for a new or modified facility that through experience and research, has proven to be operational, obtainable, and capable of reducing or eliminating emissions from the facility, and is considered technically practical and economically reasonable for the facility; and the emissions reduction can be achieved through technology such as the use of add-on control equipment or by enforceable changes in production processes, systems, methods, or work practice. The BACT requirements included in the NG EGU standard permit are based on meeting or being more stringent than existing TCEQ Tier I BACT requirements. The BACT requirements are commonly used for these sources and operation types. TCEQ Tier I BACT

requirements for spark ignited internal combustion engines include: minimizing the duration and occurrence of MSS activities, good combustion practices, limiting the firing of fuels to fuels which meet the requirements of Title 40 Code of Federal Regulations (40 CFR) §72.2, no visible emissions leaving the property, limiting volatile organic compound (VOC) emissions to 1.0 grams per brake-horsepower-hour (g/bhp-hr), limiting nitrogen oxides (NO_x) emissions to 0.5 g/bhp-hr, and limiting carbon monoxide (CO) emissions to 3.0 g/bhp-hr.

This standard permit would require NG EGUs to comply with certain requirements, including but not limited to the following: administrative requirements, including registration and fee requirements; general requirements; operational and design requirements; recordkeeping requirements; and executive director (ED) approval. This standard permit would require renewal of the registration every 10 years.

Applicants would be required to submit emission calculations for all sources of emissions using TCEQ approved calculation methodologies. Authorized emissions would be limited to those represented in the registration, not to exceed the emission limits in Table 2 of the standard permit.

Applicants would be required to calculate emissions at the highest represented operating rates. Examples of operating rates would include firing rates, throughputs, and other measurable activities. Individual contaminants from the EGU should be calculated based on supporting documentation using appropriate analysis, manufacturers' guarantees, or other data, and this documentation must be included in the registration application.

Initial performance testing and re-certification would be required for the stationary spark-ignited internal combustion engine and any associated control device(s) to demonstrate compliance with representations made in the registration application. All testing must be coordinated with the TCEQ regional office as outlined in the standard permit. If the stationary spark-ignited internal combustion engine and control device are certified as required by 40 CFR Part 60 Subpart JJJJ and operated and maintained according to the manufacturer's emission-related written instructions, then the permit holder must keep records of conducted maintenance to demonstrate compliance, but no initial determination of compliance nor continuous demonstration of compliance testing is required.

IV. Permit Condition Analysis and Justification

The following demonstrates how each section of this standard permit is enforceable and how the commission can adequately monitor compliance with the permit conditions.

Applicability

Subsection (a)(1) outlines the authorization of NG EGUs that generate electricity for use by the owner or operator and/or generate electricity to be sold to the electric grid.

Subsection (a)(2) would require owners and operators to comply with all applicable provisions of the THSC, Texas Water Code, the rules of the commission, and any other applicable federal, state, or local regulations. If operations or activities cannot meet the limitations or requirements of this standard permit, the site cannot be authorized by this standard permit.

Subsection (a)(3) would prohibit the use of the standard permit for NG EGUs that meet the definition of a new major stationary source or major modification as defined in 30 TAC §116.12 (Nonattainment and Prevention of Significant Deterioration review Definitions).

Subsection (a)(4) would require that EGUs authorized under this standard permit shall only use pipeline-quality natural gas. The subsection would also prohibit the use of the proposed standard permit to authorize boilers and turbines, since there are existing alternative authorization mechanisms containing appropriate technical requirements for these types of facilities.

Definitions

Subsection (b)(1) would establish that the words and terms in this standard permit have the meanings listed in 30 TAC Chapter 116, Subchapter A (Definitions), unless the context indicates otherwise. Unless specifically defined in the TCAA or in the rules of the commission, the terms used by the commission have the meanings commonly ascribed to them in the field of air pollution control.

Administrative Requirements

Section (c) would establish the administrative requirements for the use of the NG EGU standard permit. Subsection (c)(1) would require that the applicant receive written approval from TCEQ confirming that the facility meets the terms and conditions of the standard permit in order to begin construction or operation of facilities. Subsection (c)(2) outlines the general requirements for standard permit authorizations found in 30 TAC Chapter 116 will be applicable to facilities authorized under the proposed standard permit, including registration requirements, fee requirements, and other specific conditions within the rule language. The emission limitations in 30 TAC §116.610(a)(1), Applicability, are excluded in this standard permit.

Subsections (c)(3) through (c)(4) would establish the recordkeeping requirements for compliance with the standard permit. Subsection (c)(3) would require that the records be available for review by TCEQ, the Environmental Protection Agency (EPA), or local air pollution control agency personnel. Subsection (c)(4) specifies that copies of the permit, the application and any subsequent representations submitted to TCEQ, the manufacturer's design and operation specifications, all emission-related maintenance, and the initial compliance testing be kept for the life of the permit. Subsection (c)(5) specifies the records to be kept for a period of five years include: hours of operation and natural gas usage on a monthly and rolling 12-month basis; sulfur content of the natural gas; emission-related maintenance; visible emissions observations and corrective actions taken; and sampling performed to evaluate emissions.

General Requirements

Section (d) would establish general requirements for NG EGUs operating under the standard permit. Among these requirements are specific guidelines for engine location, stack height, stack diameter, minimum stack exit temperature, and velocity.

Section (d) would establish requirements regarding the number of engines that may be authorized under this standard permit. Subsection (d)(2) would require that engines be located at least 25 feet from the nearest point on the property line. Subsection (d)(2) includes a reference table (Table 1: Engine Distance Limitations) identifying the minimum distance from the property line to the nearest engine. As shown in the table, the minimum distance of an engine to the nearest property line is dependent on the number of engines authorized under the standard permit. The maximum allowable number of engines must not exceed six.

Subsection (d)(3) would require that a non-resettable run time meter must be installed on the engine(s).

Emission Limitations

Section (e) would establish the obligations of the owner or operator to ensure protection of public health and welfare through compliance with the applicable emission limits of each pollutant.

Subsection (e)(1) lists the emission limits (Table 2: Emissions Limitations, per Engine) and emission standards (Table 3: Emission Standards, per Engine) for engine air contaminants. These contaminants include NO_x, CO, VOC, and particulate matter, including particulate matter equal to or less than 10 microns in diameter (PM₁₀), particulate matter equal to or less than 2.5 microns in diameter (PM_{2.5}), sulfur dioxide (SO₂), sulfuric acid (H₂SO₄), and formaldehyde. These maximum limits and emission standards were set based on BACT and acceptable air quality analyses and health effects for typical EGU engines. Emission limits for SO₂ and H₂SO₄ are based on the fuel sulfur limit in subsection (f)(3) of the standard permit.

Subsection (e)(2) would require that compliance with NO_x and CO emission limits must be demonstrated per requirements in subsections (f)(4) and (f)(5) related to the initial and continuous compliance demonstrations.

Operational Requirements

Operational requirements in section (f) would establish specific operational and monitoring requirements for facilities authorized under this standard permit. These requirements were developed using the special conditions typically found in new source review (NSR) permits issued by TCEQ. This ensures that facilities authorized under this standard permit will meet air quality protectiveness, BACT, and best management practices (BMPs) to ensure proper operation of facilities authorized under this standard permit.

Subsection (f)(1) would require that emissions from each spark-ignited engine shall be limited to no more than 400 hours of operation in a rolling 12-month period.

Subsection (f)(2) would require that the engine and after-treatment control device must be operated and maintained according to the manufacturer's emission-related instructions.

Subsection (f)(3) details the operational requirements of the engine to include fuel specifications, monitoring of fuel usage, recordkeeping, and compliance demonstrations. These requirements are based on Tier I BACT.

Subsection (f)(4) and (f)(5) would establish requirements for initial determination of compliance and continuous demonstration of compliance for the engine and control device. Under paragraph (f)(4)(A), if the 40 CFR Part 60 Subpart JJJJ certified stationary spark-ignited internal combustion engine and control device are operated and maintained according to the manufacturer's emission-related written instructions and maintenance records are maintained, initial stack sampling and subsequent testing requirements found in paragraphs (f)(4)(B) – (H) and subsection (f)(5) are not required to be performed. Paragraph (f)(4)(A) would also require the owner or operator to re-certify a unit at least every three years to ensure continuing compliance with the emissions limitations.

Paragraphs (f)(4)(B) – (H) would establish specific requirements for stack sampling and initial determination of compliance. Sampling shall be conducted in accordance with TCEQ sampling guidelines (formerly Chapter 2 of the TCEQ Sampling Procedures Manual, www.tceq.texas.gov/compliance/investigation/air/air-stack), and EPA stack testing guidance (www.epa.gov/compliance/clean-air-act-national-stack-testing-guidance). If stack sampling is required, it must be coordinated with the TCEQ regional office in a pre-test notification through the TCEQ Stack Test Online Reporting System (STORS, www3.tceq.texas.gov/steers/) to determine methodologies and other details for the testing not outlined within the permit requirements.

Additionally, continuous compliance shall be demonstrated as outlined in subsection (f)(5).

Opacity requirements would be established in subsection (f)(6). Under this subsection, no visible emissions shall leave the property. Visible emissions shall be determined by a standard of no visible emissions exceeding 30 seconds in duration in any six-minute period as determined using EPA Test Method 22 (TM 22) or equivalent.

V. Protectiveness Review

TCEQ performed an air quality analysis (AQA) in support of the protectiveness review for the NG EGU standard permit. The AQA included generic modeling to determine the number of engines and set back distance from a property line that yield predictions that are less than significant impact levels (SILs) for criteria pollutants and less than two percent of the associated state property line (SPL) standard for pollutants with a SPL standard.

TCEQ performed the modeling using EPA's ISCST3 (version 04272) model. Modelers have been using the ISC model in permitting for more than 30 years. Developers created the model to be easy to use and to address complex atmospheric processes in a relatively simple way that all users can understand. Developers based the ISCST3 model on the Gaussian distribution equation and it is inherently conservative due to the main simplifying assumptions made in its derivation. These assumptions are:

- Conditions are steady-state (for each hour, emissions, wind speed, and direction are constant) and the dispersion from source to receptor is effectively instantaneous.
- There is no plume history as model calculations in each hour are independent of those in other hours.
- Mass is conserved (no removal due to interaction with terrain, deposition, or chemical transformation) and is reflected at the surface; and
- Plume spread from the centerline follows a normal Gaussian distribution and only vertical and crosswind dispersion occurs. The model ignores dispersion downwind.

TCEQ applied the model in a screening mode to ensure predictions were conservative and applicable for any location in the state. Additionally, using ISCST3 as a screening technique eliminate the need for more detailed modeling when those sources clearly will not cause or contribute to ambient concentrations in excess of the National Ambient Air Quality Standards (NAAQS) and SPL standards.

The modeling was conducted using both rural and urban dispersion coefficients. The higher concentration of the two options was used as the maximum predicted concentration. The modeling used the flat terrain option. Flat terrain is reasonable to use since it is consistent with typical site locations for these facilities and given that the maximum modeled predictions occur near the modeled source.

The modeling used a polar receptor grid with 36 radials spaced every 10 degrees from true north. Each radial includes a receptor beginning at 25 feet from the engine. Receptors were located at distances of 25, 50, and 100 feet, and every 100 feet out to 1000 feet from the engine. The modeling used surface meteorological data from Austin and upper-air meteorological data from Victoria for the years 1983, 1984, 1986, 1987, and 1988. Since the controlling analysis are primarily the short-term analyses, this five-year data set would include worst-case, short-term meteorological conditions that could occur anywhere in the state. The wind directions were set at 10-degree intervals to coincide with the receptor radials. This would provide predictions along the plume centerline, which provides a conservative result.

The modeling represented emissions from engines as a single point source with a stack height of 25 feet, exit temperature of 961 Fahrenheit, exit velocity of 442 feet per second, and exit diameter of 8 inches.

The modeling included two different cases for the downwash analysis. Case 1 is a scenario in which there are no nearby structures; only the engine housing structure is used as input. The dimensions for a typical engine housing structure were used (horizontal dimension of approximately 30 feet by 10 feet, and a vertical dimension of 10 feet). Case 2 is a scenario that considers a nearby structure larger than the engine housing structure. The dimensions for the nearby structure are representative of a typical building (horizontal dimension of approximately 40 feet by 40 feet, and a vertical dimension of 25 feet). The worst-case predictions between the two were used in the AQA.

An emission rate of 1 lb/hr was used to predict generic short-term and annual concentrations from a single engine. The generic concentrations were multiplied by the emission rates listed in Table 2 of the standard permit to determine a maximum predicted concentration for each pollutant. The applicable thresholds (either SIL or 2 percent of SPL) were divided by the maximum predicted concentrations to determine the number of engines at each setback distance that yield predictions that are less than the thresholds. Complete documentation of the AQA is available at: www.tceq.texas.gov/permitting/air/nav/standard.html.

VI. Public Notice and Comment Period

In accordance with 30 TAC §116.603, Public Participation in Issuance of Standard Permits, TCEQ will publish notice of the proposed standard permit in the Texas Register and newspapers of the largest general circulation in Austin, Houston, and Dallas. The public comment period will run from the date of publication until midnight on July 30, 2024.

After the public comment period, TCEQ may revise the draft standard permit if appropriate. The final standard permit will be considered by the commission for adoption. Upon adoption of the standard permit by the commission, the final standard permit and a response to all comments received will be made available on TCEQ's website.

Written comments may be submitted to Ms. Gwen Ricco, MC 205, Office of Legal Services, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087, or faxed to fax4808@tceq.texas.gov. Electronic comments may be submitted at: www6.tceq.texas.gov/rules/ecomments/. File size restrictions may apply to comments being submitted via the eComments system. All comments should reference Non-Rule Project Number 2024-005-OTH-NR. The comment period closes midnight on July 30, 2024. Copies of the standard permit can be obtained from the commission's website at www.tceq.texas.gov/permitting/air/nav/standard.html.

For further information, please contact Ms. Suzanne Alexander, Air Permits Division, at 512-239-2134.

VII. Public Meeting

The commission will hold a hybrid in-person and virtual public meeting on this proposal in Austin on Tuesday, July 30, 2024, at 10:00 a.m. in Building F, room 2210, at the commission's central office located at 12100 Park 35 Circle. The meeting is structured for the receipt of oral or written comments by interested persons. Individuals may present oral statements when called upon in order of registration. Open discussion will not be permitted during the meeting; however, commission staff members will be available to discuss the proposal 30 minutes prior to the meeting.

Individuals who plan to attend the meeting virtually and want to provide oral comments and/or want their attendance on record or want to participate in the informal question and answer period prior to the meeting must register by Friday, July 26, 2024.

Instructions for participating in the meeting will be sent on Monday, July 29, 2024. To register, please email Rules@tceq.texas.gov and provide the following information:

1. Subject: Register for NRPN 2024-005-OTH-NR
2. Your Name
3. Title
4. Whom you represent (self or company/client)
5. Mailing Address
6. Phone Number
7. Whether you wish to provide official testimony, want your attendance on the record, or want to participate in the informal question-and-answer period prior to the meeting.

Members of the public who do not wish to participate in the meeting but would like to view the meeting may do so at no cost at:

teams.microsoft.com/l/meetup-join/19%3ameeting_MmUwYzJmZTgtNjhiNi00ODA3LWJhZDltYjcwZDY1Yzq0ZTU0%40thread.v2/0?context=%7b%22Tid%22%3a%22871a83a4-a1ce-4b7a-8156-3bcd93a08fba%22%2c%22Oid%22%3a%22e74a40ea-69d4-469d-a8ef-06f2c9ac2a80%22%2c%22IsBroadcastMeeting%22%3atrue%7d

Persons who have special communication or other accommodation needs who are planning to attend the hearing should contact Ms. Gwen Ricco, Office of Legal Services at (512) 239-2678 or 1-800-RELAY-TX (TDD). Requests should be made as far in advance as possible in order to allow adequate time to set up accommodations.

Please periodically check www.tceq.texas.gov/permitting/air/nav/nsr_news.html before the meeting date for meeting related updates.

If you need translation services, please contact TCEQ at 800-687-4040. Si desea información general en español, puede llamar al 800-687-4040.

VIII. Analysis of Comments

Section VIII (Analysis of Comments) will be completed following the end of the public comment period.

IX. Statutory Authority

This standard permit is proposed under THSC, §382.011, General Powers and Duties, which authorizes the commission to control the quality of the state's air, THSC §382.023, Orders, which authorizes the commission to issue orders necessary to carry out the policy and purposes of the TCAA, THSC §382.051, Permitting Authority of the Commission; Rules, which authorizes the commission to issue permits, including standard permits for similar facilities for numerous similar sources, THSC §382.0513, Permit Conditions, which authorizes the commission to establish and enforce permit conditions consistent with Subchapter C of the TCAA, and THSC §382.05195, Standard Permits, which authorizes the commission to issue standard permits according to the procedures set out in that section.