

ENGINEERING EVALUATION

Facility ID No. 7638
APCT, Inc.
3495 De La Cruz Blvd, Santa Clara, CA 95050
Application No. 703163

Background

APCT, Inc. (“APCT”) is applying for an Authority to Construct/Permit to Operate for the following equipment:

S-10 Emergency Standby Natural Gas Generator (with integral Catalyst)
Make: Power Solutions International, Inc., Model: 5.7L, Model Year: 2024
Rating: 159 bhp, 0.744 MMBTU/hr; Fuel Use Rate: 709 ft³/hr

The criteria pollutants are nitrogen oxides (NO_x), carbon monoxide (CO), precursor organic compounds (POC) from unburned fuel, sulfur dioxide (SO₂) and particulate matter (PM₁₀). All of these pollutants are briefly discussed on the Air District’s web site at www.baaqmd.gov.

This application was submitted in response to NOV #A61632. This evaluation report will discuss compliance of the proposed project with all applicable rules and regulations.

Emissions

Annual emissions estimates for S-10 are included in Table 1. The following assumptions apply:

- Annual emissions based on 50 hours per year of Reliability-related activity
- Maximum daily emissions: 24-hour operation
- PM emission factors obtained from AP-42 Chapter 3, Table 3.2-3, “Uncontrolled Emission Factors for 4-Stroke Rich-Burn Engines.” (0.0095 lbs/MMBtu). In this evaluation, the emission factors for PM_{2.5} and PM₁₀ are assumed to be the same as PM.
- SO₂ emission factor calculated based on the following:
 - Complete conversion of sulfur in fuel to SO₂
 - SO₂ emission factor obtained from AP-42 Chapter 3, Table 3.2-3, “Uncontrolled Emission Factors for 4-Stroke Rich-Burn Engines,” which is based off a sulfur content in Natural Gas of 2,000 grains per million standard cubic feet of natural gas. (0.000588 lbs/MMBtu)
 - BAAQMD assumes a SO₂ content in Natural Gas of 10 grains per thousand standard cubic feet of natural gas (10,000 grains per MMSCF).
 - Adjusting the AP-42 emission factor for the BAAQMD sulfur content assumptions, the emission factor used is 0.00294 lbs/MMBtu (5 x 0.000588).

Table 1. Annual and Daily Emissions for S-10 from EPA Certified Data (NRSI)

Pollutant	Unabated Emission Factors		NSCR Abatement Factor ⁽²⁾	Abated Emission Factor ⁽¹⁾	Max Daily Emissions ⁽¹⁾		Average Annual Emissions ⁽¹⁾	
	(g/bhp-hour) ⁽²⁾	(pounds/MMBTU)	%	(g/bhp-hour)	(lbs/hr)	(lbs/day)	(lbs/yr)	(tons/yr)
NO _x	0.007	N/A	85	0.001	0.0004	0.01	0.02	8.77E-06
POC	0.108	N/A	50	0.054	0.0189	0.45	0.95	4.74E-04
CO	1.670	N/A	80	0.334	0.1172	2.81	5.86	2.93E-03
PM ₁₀	N/A	0.0095	N/A	N/A	0.0071	0.17	0.35	1.77E-04
PM _{2.5}	N/A	0.0095	N/A	N/A	0.0071	0.17	0.35	1.77E-04
SO ₂	N/A	0.0029	N/A	N/A	0.0022	0.05	0.11	5.47E-05

Table 1 Basis:

- ¹Emission factors of NO_x, POC, and CO provided by EPA certified data for engine family RPSIB5.70NGP (EPA Certificate #RPSIB5.70NGP-010).
- ²Unabated emissions of NO_x, POC, and CO from S-10 were estimated assuming mass emissions would be reduced via A-1 by 85%, 50%, and 80%, respectively, per BAAQMD default abatement factors.

Plant Cumulative Increase

Table 2 summarizes the cumulative increase in criteria pollutant emissions that will result from this application. As all sources were installed post 4/5/91 and the facility does not have any exempt and/or registered sources; therefore, the existing plant cumulative increase is equivalent to the plant PTE.

In accordance with the Air District’s Policy for Calculating Potential to Emit of Emergency Generators, Table 2 summarizes the cumulative increase in criteria pollutant emissions that will result from this application assuming S-10 will operate for 50 hours/year for reliability related testing.

Table 2. Plant Cumulative Emissions Increase, Post 4/5/91

Pollutant	Existing Emissions Post 4/5/91 (tons/yr)	Application Emissions (tons/yr)	Cumulative Emissions (tons/yr)
NO _x	0.0000	0.00001	0.00001
POC	1.6700	0.00047	1.67047
CO	0.0000	0.00293	0.00293
PM ₁₀ /PM _{2.5}	0.0000	0.00018	0.00018
SO ₂	0.0000	0.00005	0.00005

Health Risk Assessment (HRA)

In accordance with the Air District’s policy “Calculating Potential to Emit for Emergency Backup Power Generators”, annual Hazardous Air Pollutants (HAP)/Toxic Air Contaminants (TAC) emissions from S-10 summarized in Table 3 are based on 50 hours per year for reliability-related testing, a combined rating of 0.744 MMBtu/hr, and an abatement control efficiency of 50% by wt. was applied.

The emission factors used to estimate TAC emissions from S-10 are from either:

- The California Air Toxics Emission Factor (CATEF) database maintained by the California Air Resources Board (Internal Combustion Engine; Natural Gas; 4S/Rich/<650Hp); or
- AP 42 Table 3.2-3

The emission factors used to estimate TAC emissions from S-10 were selected in the order of priority listed below:

- 1) Unabated CATEF factors, for pollutants identified in Footnote 8 of Table 2 5 1 of Air District Regulation 2, Rule 5 to calculate Polycyclic Aromatic Hydrocarbon (PAH) emissions. The unabated CATEF factor for each chemical species was multiplied by their corresponding Potency Equivalency Factor (PEF) listed in Footnote 8 and then each product was summed. The CATEF database provides maximum, mean, and median emission factors. Consistent with the methodology suggested in the Air District's Petroleum Refinery Emissions Inventory Guidelines, the mean PAH emission factors from the CATEF database were used to estimate TAC emissions in this evaluation report.
- 2) Unabated CATEF factors, where available. The CATEF database provides maximum, mean, and median emission factors. Consistent with the methodology suggested in the Air District's Petroleum Refinery Emissions Inventory Guidelines, the mean emission factors for non-PAHs from the CATEF database were used to estimate TAC emissions in this evaluation report.
- 3) AP 42 Table 3.2-3 factors, for any remaining TACs not already listed in items 1 or 2 above.

There are several xylene emission factors available from these data sources: AP-42 Table 3.2-3 for "Xylene", unabated CATEF for "Xylene (m,p)", unabated CATEF for "Xylene (o)", and unabated CATEF for "Xylene (Total)". The highest emission factor of these options was the sum of unabated CATEF Xylene (m,p) and Xylene (o). This factor was used to estimate total Xylene emissions.

Table 3: Hourly and Annual Project TAC Emissions

Compound	Chosen Emission Factor	Unit	Basis	Acute Emissions lbs/hour	Acute Trigger Level (lbs/hour)	Emissions > Acute Trigger?	Chronic Emissions lbs/year	Chronic Trigger Level (lbs/year)	Emissions > Chronic Trigger?
1,1,2,2-Tetrachloroethane	2.53E-05	lb/MMBtu	AP-42	1.9E-05	None	None	9.4E-04	1.4E+00	no
1,1,2-Trichloroethane	1.27E-05	lb/MMBtu	AP-42	9.4E-06	None	None	4.7E-04	5.0E+00	no
1,1-Dichloroethane	7.65E-06	lb/MMBtu	AP-42	5.7E-06	None	None	2.8E-04	5.0E+01	no
1,3-Butadiene	9.90E-05	lb/MMBtu	CATEF	7.4E-05	1.5E+00	no	3.7E-03	4.8E-01	no
Acetaldehyde	8.41E-04	lb/MMBtu	CATEF	6.3E-04	1.0E+00	no	3.1E-02	2.9E+01	no
Acrolein	5.21E-04	lb/MMBtu	CATEF	3.9E-04	5.5E-03	no	1.9E-02	1.4E+01	no
Benzene (no control)	1.82E-03	lb/MMBtu	CATEF	1.4E-03	6.0E-02	no	6.8E-02	2.9E+00	no
Carbon Tetrachloride	9.10E-04	lb/MMBtu	AP-42	6.8E-04	4.2E+00	no	3.4E-02	1.9E+00	no
Chlorobenzene	8.85E-06	lb/MMBtu	AP-42	6.6E-06	None	None	3.3E-04	3.9E+04	no
Chloroform	6.45E-06	lb/MMBtu	AP-42	4.8E-06	3.3E-01	no	2.4E-04	1.5E+01	no
Ethylbenzene	1.10E-05	lb/MMBtu	CATEF	8.2E-06	None	None	4.1E-04	3.3E+01	no
Ethylene Dibromide	1.24E-05	lb/MMBtu	AP-42	9.2E-06	None	None	4.6E-04	1.1E+00	no
Formaldehyde (no control)	2.24E-03	lb/MMBtu	CATEF	1.7E-03	1.2E-01	no	8.3E-02	1.4E+01	no
Methanol	3.06E-03	lb/MMBtu	AP-42	2.3E-03	6.2E+01	no	1.1E-01	1.5E+05	no
Methylene Chloride	4.12E-05	lb/MMBtu	AP-42	3.1E-05	3.1E+01	no	1.5E-03	8.2E+01	no
Naphthalene	7.29E-05	lb/MMBtu	CATEF	5.4E-05	None	None	2.7E-03	2.4E+00	no
PAH Equivalent as Benzo(a)pyrene	2.06E-07	lb/MMBtu	CATEF	1.5E-07	None	None	7.7E-06	3.3E-03	no
Propylene	1.52E-02	lb/MMBtu	CATEF	1.1E-02	None	None	5.7E-01	1.2E+05	no
Styrene	7.62E-03	lb/MMBtu	AP-42	5.7E-03	4.6E+01	no	2.8E-01	3.5E+04	no
Toluene	1.02E-03	lb/MMBtu	CATEF	7.6E-04	8.2E+01	no	3.8E-02	1.2E+04	no
Vinyl Chloride	5.10E-04	lb/MMBtu	AP-42	3.8E-04	4.0E+02	no	1.9E-02	1.1E+00	no
Xylene (total)	6.27E-04	lb/MMBtu	CATEF	4.7E-04	4.9E+01	no	2.3E-02	2.7E+04	no

It can be seen from Table 3 that a Health Risk Assessment (HRA) is not required for this application since it is exempt from Regulation 2-5 per Section 2-5-110, which exempts low emitting sources.

Best Available Control Technology (BACT)

In accordance with Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NO_x, CO, SO₂, PM₁₀ or PM_{2.5}. Per Table 1, BACT is not triggered.

Offsets

Offset must be provided for any new or modified source at a facility that will have the potential to emit more than 10 tons per year of NOx or POC, as specified in Regulation 2-2-302; 100 tons per year or more of PM_{2.5}, PM₁₀ or sulfur dioxide, as specified in Regulation 2-2- 303.

Table 4. Potential to Emit

Pollutant	Existing Annual Emissions (TPY)	Application Annual Emissions* (TPY)	Facility Annual Emissions (TPY) *	Offset Requirement (TPY)	Offset Required
NOx	0.0000	0.00003	0.00003	>10	N
POC	1.6700	0.00142	1.67142	>10	N
CO	0.0000	0.00879	0.00879	-	N
PM ₁₀ /PM _{2.5} ¹	0.0000	0.00053	0.00053	≥100	N
SO ₂	0.0000	0.00053	0.00053	≥100	N

**Annual emissions: Reliability-related activity of 50 hours and emergency operation of 100 hours for S-10.*

Since the facility’s potential to emit is below the offsets trigger levels specified in Regulation 2-2, offsets are not required.

Statement of Compliance

The owner/operator is expected to comply with all applicable requirements. Key requirements are listed below:

District Rules

Regulation 6-1 (Particulate Matter – General Requirements)

S-10 is subject to Regulation 6, Rule 1. Opacity and visible emissions from S-10 are limited by Regulations 6-1-303.1 (internal combustion engines of less than 25 liters (1500 in3) displacement) and 6-1-303.2 (engine used solely as a standby source of motive power) to Ringelmann 2.

Regulation 6-1-305 prohibits emission of particles from any operation in sufficient number to cause annoyance to any other person where the particles are large enough to be visible as individual particles at the emission point, or of such size and nature as to be visible individually as incandescent particles. S-10 is not expected to produce visible emissions or fallout in violation of this regulation and will be assumed to be in compliance with Regulation 6-1-305.

Regulation 6-1-310 (*Total Suspended Particulate (TSP) Concentration Limits*) prohibits emissions in excess of 0.15 gr/dscf of exhaust gas volume.

Regulation 8, Rule 1, "Organic Compounds – General Provisions"

All internal combustion engines are exempt from Regulation 8 per Section 8-1-110.2. Therefore, S-10 is exempt from all Regulation 8 rules.

Regulation 9-1-301 (Limitations on Ground Level Concentrations)

S-10 is subject to and is expected to comply with the applicable SO₂ limitations in Regulation 9, Rule 1 (“Inorganic Gaseous Pollutants – Sulfur Dioxide”). Because SO₂ emissions from S-10 are negligible, it is unlikely the APCO will require APCT to conduct ground level monitoring.

Regulation 9-8 (Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines)

S-10 will be operated as an emergency standby engine and is therefore not subject to the emission rate limits in Regulation 9, Rule 8 ("Inorganic Gaseous Pollutants – NO_x and CO from Stationary Internal Combustion Engines"). S-10 is exempt from the requirements of Sections 9-8-301 through 305, 501, and 503 per Regulation 9-8-110.5 (Emergency Standby Engines). S-10 is subject to and is expected to comply with 9-8-330.3 (Emergency Standby Engines, Hours of Operation) since non-emergency hours of operation will be limited in the permit conditions to 50 hours per year. S-10 is also subject to and is expected to comply with monitoring and recordkeeping requirements of Regulations 9-8-502.1 and 9-8-530, which are incorporated into the proposed permit conditions.

California Environmental Quality Act (CEQA)

The Air District has determined that the issuance of this Authority to Construct is exempt from CEQA because the Air District's approval was "ministerial" and therefore exempt from CEQA under CEQA § 21080(b)(1). The Air District regulatory requirements that governed the approval of this project involved objective numerical standards, which did not allow for or require any subjective judgment or discretion to interpret or apply; and the Air District was legally compelled to approve the project where it complied with such standards. Thus, the Air District's action was ministerial.

The Air District has determined that the issuance of this Authority to Construct is also exempt from CEQA because the permitting of the project involved no expansion of use beyond that existing at the time of the Air District's CEQA determination. (CEQA § 21084; Guidelines § 15301).

New Source Performance Standards (NSPS)

S-10 is subject to 40 CFR 60, Subpart JJJJ (NSPS JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines per §60.4230(a)(4) since it will be constructed after June 12, 2006 and the engine was manufactured after January 1, 2009. Per §60.4233(e), S-10 is subject to the NO_x+HC and CO emissions standards in Table 1 of NSPS JJJJ of 2.0 g/hp-hour and 4.0 g/hp-hour, respectively. It can be seen from Table 1 in this evaluation report that S-10 complies with the emission standards in NSPS JJJJ.

National Emissions Standards for Hazardous Air Pollutants (NESHAP)

S-10 is subject to 40 CFR 63, Subpart ZZZZ (MACT ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines because the engine will be constructed (~installed) on/after June 12, 2006. Per §63.6590(c)(1), "new" sources such as S-10 are required to meet the requirements in MACT ZZZZ by meeting the requirements in NSPS JJJJ. As previously discussed, S-10 complies with NSPS JJJJ and therefore, will comply with MACT ZZZZ as well.

Prevention of Significant Deterioration (PSD)

This application is not part of a PSD project as defined in Regulation 2-2.

Public Notification (Regulation 2-1-412)

The public notification requirements of Regulation 2-1-412 apply to new or modified projects which either 1) will result in an increase in the emission of toxic air contaminant, hazardous air contaminant, or is on the list required to be prepared pursuant to subdivision (a) of Section 25532

or Section 44321 subsections (a) to (f) inclusive of the Health and Safety Code and are located within 1,000 feet of the boundary of a K-12 school, or 2) are located within an overburdened community (OBC) and require an HRA. The project involves a new source and, though the facility site is not located within an OBC, the following K-12 schools are located within 1,000 feet of the source and the project will result in an increase in toxic air contaminant emissions:

- Montague Elementary School (750 Laurie Ave, Santa Clara, CA 95054)

Therefore, this application is subject to the public notification requirements of Regulation 2-1-412.

Permit Condition

Permit Condition #23112 for S-10

1. The owner or operator shall operate the stationary emergency standby engine, only to mitigate emergency conditions or for reliability-related activities (maintenance and testing). Operating while mitigating emergency conditions and while emission testing to show compliance with this part is unlimited. Operating for reliability related activities are limited to 50 hours per year. (Basis: Emergency Standby Engines, Hours of Operation Regulation 9-8-330)
2. The Owner/Operator shall equip the emergency standby engine(s) with: a non-resettable totalizing meter that measures hours of operation or fuel usage. (Basis: Emergency Standby Engines, Monitoring and Recordkeeping 9-8-530)
3. Records: The Owner/Operator shall maintain the following monthly records in a District approved log for at least 36 months from the date of entry, (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on site, either at a central location or at the engine's location and made immediately available to the District staff upon request.
 - a. Hours of operation (maintenance and testing).
 - b. Hours of operation for emission testing.
 - c. Hours of operation (emergency).
 - d. For each emergency, the nature of the emergency condition.
 - e. Fuel usage for engine.(Basis: Emergency Standby Engines, Monitoring and Recordkeeping 9-8-530)

End of Conditions

Recommendation

The Air District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of Air District, state, and federal air quality-related regulations. The preliminary determination is to issue an Authority to Construct for the equipment listed below. However, the proposed source will be located within 1,000 feet of a K-12 school and will result in an increase in the emission of toxic air contaminants, which triggers the public notification requirements of District Regulation 2-1-412. After the comments are received and reviewed, the Air District will make a final determination on the permit.

I recommend that the Air District initiates a public notice and considers any comments received prior to taking any final action on issuance of an Authority to Construct for the following source:

S-10 Emergency Standby Natural Gas Generator (with integral Catalyst)
Make: Power Solutions International, Inc., Model: 5.7L, Model Year: 2024
Rating: 159 bhp, 0.744 MMBTU/hr; Fuel Use Rate: 709 ft³/hr

Prepared By: Eric Grulke, Senior Air Quality Engineer, 7/17/2024