

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION**

August 30, 2018

**PERMIT TO INSTALL
39-18**

**ISSUED TO
Eastern Michigan University**

**LOCATED AT
875 Ann Street
Ypsilanti, Michigan**

**IN THE COUNTY OF
Washtenaw**

**STATE REGISTRATION NUMBER
H5877**

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environmental Quality. This permit is hereby issued in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203:

March 5, 2018

DATE PERMIT TO INSTALL APPROVED:

August 30, 2018

SIGNATURE:

DATE PERMIT VOIDED:

SIGNATURE:

DATE PERMIT REVOKED:

SIGNATURE:

PERMIT TO INSTALL

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Common Abbreviations / Acronyms

Common Acronyms		Pollutant / Measurement Abbreviations	
AQD	Air Quality Division	BTU	British Thermal Unit
BACT	Best Available Control Technology	°C	Degrees Celsius
CAA	Clean Air Act	CO	Carbon Monoxide
CEM	Continuous Emission Monitoring	dscf	Dry standard cubic foot
CFR	Code of Federal Regulations	dscm	Dry standard cubic meter
CO _{2e}	Carbon Dioxide Equivalent	°F	Degrees Fahrenheit
COM	Continuous Opacity Monitoring	gr	Grains
EPA	Environmental Protection Agency	Hg	Mercury
EU	Emission Unit	hr	Hour
FG	Flexible Group	H ₂ S	Hydrogen Sulfide
GACS	Gallon of Applied Coating Solids	hp	Horsepower
GC	General Condition	lb	Pound
GHGs	Greenhouse Gases	kW	Kilowatt
HAP	Hazardous Air Pollutant	m	Meter
HVLP	High Volume Low Pressure *	mg	Milligram
ID	Identification	mm	Millimeter
LAER	Lowest Achievable Emission Rate	MM	Million
MACT	Maximum Achievable Control Technology	MW	Megawatts
MAERS	Michigan Air Emissions Reporting System	ng	Nanogram
MAP	Malfunction Abatement Plan	NO _x	Oxides of Nitrogen
MDEQ	Michigan Department of Environmental Quality (Department)	PM	Particulate Matter
MSDS	Material Safety Data Sheet	PM10	PM with aerodynamic diameter ≤10 microns
NESHAP	National Emission Standard for Hazardous Air Pollutants	PM2.5	PM with aerodynamic diameter ≤ 2.5 microns
NSPS	New Source Performance Standards	pph	Pounds per hour
NSR	New Source Review	ppm	Parts per million
PS	Performance Specification	ppmv	Parts per million by volume
PSD	Prevention of Significant Deterioration	ppmw	Parts per million by weight
PTE	Permanent Total Enclosure	psia	Pounds per square inch absolute
PTI	Permit to Install	psig	Pounds per square inch gauge
RACT	Reasonably Available Control Technology	scf	Standard cubic feet
ROP	Renewable Operating Permit	sec	Seconds
SC	Special Condition	SO ₂	Sulfur Dioxide
SCR	Selective Catalytic Reduction	THC	Total Hydrocarbons
SRN	State Registration Number	tpy	Tons per year
TAC	Toxic Air Contaminant	µg	Microgram
TEQ	Toxicity Equivalence Quotient	VOC	Volatile Organic Compound
VE	Visible Emissions	yr	Year

* For High Volume Low Pressure (HVLP) applicators, the pressure measured at the HVLP gun air cap shall not exceed ten (10) pounds per square inch gauge (psig).

GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **(R 336.1201(1))**
2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environmental Quality, P.O. Box 30260, Lansing, Michigan 48909-7760, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **(R 336.1201(4))**
3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to R 336.1210, operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **(R 336.1201(6)(b))**
4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **(R 336.1201(8), Section 5510 of Act 451, PA 1994)**
5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to R 336.1219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of R 336.1219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environmental Quality. **(R 336.1219)**
6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **(R 336.1901)**
7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**
8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.
9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.

11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of R 336.1301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with R 336.1303. **(R 336.1301)**
 - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
 - b) A visible emission limit specified by an applicable federal new source performance standard.
 - c) A visible emission limit specified as a condition of this Permit to Install.

12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in R 336.1370(2). **(R 336.1370)**

13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with R 336.2001 and R 336.2003, under any of the conditions listed in R 336.2001. **(R 336.2001)**

SPECIAL CONDITIONS

EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date / Modification Date	Flexible Group ID
EU- POWERGENERATION	One Solar turbine with heat recovery steam generator (HRSG). Turbine is a Solar Taurus 70-10801S Axial turbine fired with natural gas. The turbine is equipped with So-Lo-Nox technology for the control of NOx emissions. The turbine has a rated heat release of 90.3 MMBtu/hr. This emission unit also includes a 62.2 MMBtu/hr. duct burner and heat recovery boiler fired with natural gas.	12/01/2017	FGFACILITY
Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.			

The following conditions apply to:
EU-POWERGENERATION

DESCRIPTION: One Solar turbine with heat recovery steam generator (HRSG). Turbine is a Solar Taurus 70-10801S Axial turbine fired with natural gas. The turbine is equipped with So-Lo-Nox technology for the control of NO_x emissions. The turbine has a rated heat release of 90.3 MMBtu/hr. This emission unit also includes a 62.2 MMBtu/hr. duct burner and heat recovery boiler fired with natural gas.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT: SO-LO-NO_x technology for the control of NO_x emissions.

I. EMISSION LIMITS

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. CO	30 ppmv at 15% oxygen	Hourly	EU-POWERGENERATION	SC V.2	R 336.1205(1)(a),
2. CO	10.30 pph	Hourly	EU-POWERGENERATION	SC V.2	R 336.1205(1)(a)
3. CO	45.1 tpy	12-month rolling time period as determined at the end of each calendar month	EU-POWERGENERATION	SC V1.2	R 336.1205(1)(a)
4. NO _x	25 ppmv at 15% oxygen	30-day rolling average (when using a CEMS or equivalent)	EU-POWERGENERATION	SC V.1	40 CFR 60.4320, R 336.1205(1)(a)
5. NO _x	10.90 pph	Hourly	EU-POWERGENERATION	SC V.1	R 336.1205(1)(a) 40 CFR 52.21 (c) & (d)
6. NO _x	44.7 tpy	12-month rolling time period as determined at the end of each calendar month	EU-POWERGENERATION	SC VI.2	R 336.1205(1)(a)
7. PM10	0.015 lb/MMBtu	Hourly	EU-POWERGENERATION	SC V.2 SC VI.3	R 336.1205(1)(a)
8. PM10	2.01 pph	Hourly	EU-POWERGENERATION	SC V.2	R 336.1205(1)(a)
9. PM10	8.8 tpy	12-month rolling time period as determined at the end of each calendar month	EU-POWERGENERATION	SC VI.2	R 336.1205(1)(a)
10. PM2.5	0.015 lb/MMBtu	Hourly	EU-POWERGENERATION	SC V.2 VI.3	R 336.1205(1)(a)
11. PM2.5	2.01 pph	Hourly	EU-POWERGENERATION	SC V.2 SC VI.3	R 336.1205(1)(a) 40 CFR 52.21 (c) & (d)
12. PM2.5	8.8 tpy	12-month rolling time period as determined at the end of each calendar month	EU-POWERGENERATION	SC VI.2	R 336.1205(1)(a)

II. MATERIAL LIMITS

NA

III. PROCESS/OPERATIONAL RESTRICTIONS

1. The turbine shall not be fired with any fuel other than pipeline quality natural gas in EU-POWERGENERATION. Pipeline natural gas is defined in 40 CFR Part 72 Section 72.2. **(R 336.1205(1)(a))**
2. The permittee shall submit to the AQD District Supervisor a plan that describes how emissions will be minimized during startup and shutdown within 60 days of completion of modifications to EU-POWERGENERATION. The plan shall incorporate procedures recommended by the equipment manufacturer as well as incorporating standard industry practices. Unless notified by the AQD District Supervisor within 30 business days after plan submittal, the plan shall be deemed approved. **(R 336.1205(1)(a), R 336.1911, R 336.1912)**

IV. DESIGN/EQUIPMENT PARAMETERS

NA

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. Within 60 days after achieving the maximum production rate, but not later than 180 days after initial startup, federal Standards of Performance for New Stationary Sources require verification of NO_x emission rates from EU-POWERGENERATION, by testing at owner's expense, in accordance with 40 CFR Parts 60.8 and 60.4400.
 - a. The permittee shall conduct three separate test runs, at least 20 minutes each, at ambient temperatures greater than 0 °F, and at any load condition within ±25 percent of 100 percent peak load.
 - b. Testing must be conducted annually (at least every 14 calendar months).
 - c. If the stack test result is less than or equal to 75 percent of the NO_x limits in SC I.3, I.2, and I.4, the test plan can be changed to once every two years (at least every 26 calendar months). If subsequent test results yield NO_x emissions greater than 75 percent of the NO_x limit in SC I.1, I.2, and I.3, annual testing must be resumed.
 - d. Subsequent stack testing is not required if the permittee shows continuous compliance with the NO_x emission limits with the continuous parameter monitoring system pursuant to 40 CFR 60.4340(b)(ii), as specified in SC VI.1.
 - e. Stack testing procedures and the location of stack testing ports shall be in accordance with the applicable Federal Reference Methods, 40 CFR Part 60 Appendix A.

No less than 45 days prior to testing, a complete test plan shall be submitted to the AQD. The final plan must be approved by the AQD prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test. **(40 CFR 60.4400)**

2. Within 60 days after notification of the Air Quality Division, the permittee shall verify, CO, PM10 and PM2.5 emission rates from EU-POWERGENERATION by testing at the owner's expense, in accordance with Department requirements. Testing shall be performed using an approved EPA Method listed in:

Pollutant	Test Method Reference
PM10	40 CFR Part 60, Appendix A
PM2.5	40 CFR Part 60, Appendix A
CO	40 CFR Part 60, Appendix A

An alternate method, or a modification to the approved EPA Method, may be specified in an AQD approved Test Protocol. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing, including any modifications to the method in the test protocol that are proposed after initial submittal. The permittee must submit a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. **(R 336.1205(1)(a)), R 336.1331(1)(c), R 336.2001, R 336.2003, R 336.2004, 40 CFR 52.2 (c) and (d))**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. In lieu of the subsequent stack test requirements listed in SC V.1, the permittee may instead continuously monitor appropriate parameters to determine that the turbine is operating in low-NO_x mode. The parameters must be continuously monitored and recorded during the initial performance test to establish acceptable values and ranges. The permittee must develop and keep on-site a parameter monitoring plan pursuant to 40 CFR 60.4355 (a)(1) through (6). **(40 CFR 60.4340(b)(ii), 40 CFR 60.4355, 40 CFR 60.4410)**
2. The permittee shall maintain the following records for EUPOWERGENERATION:
 - a. PM₁₀ emission rate, in tons/month, and tons per 12 month rolling time period as determined at the end of each calendar month.
 - b. CO emission rate, in tons/month, and tons per 12 month rolling time period as determined at the end of each calendar month.
 - c. PM_{2.5} emission rate, in tons/month, and tons per 12 month rolling time period as determined at the end of each calendar month.
 - d. NO_x emission rate, in tons/month, and tons per 12 month rolling time period as determined at the end of each calendar month.**(R 336.1205(1)(a), R 336.2802(4))**
3. The permittee shall keep, in a satisfactory manner, records of testing required in SC V.1 or manufacturer certification documentation indicating that EUPOWERGENERATION complies with the PM₁₀ and PM_{2.5} limits contained in SC I.7 and SC I.10. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1205(1)(a))**

VII. REPORTING

1. If a continuous parameter monitoring system to determine continuous compliance with the NO_x emission limits pursuant to SC VI.1 is used, the permittee shall submit excess emissions and monitor downtime in accordance with 40 CFR 60.7(c) and 60.4380(c). An excess emission is a 4-hour rolling operating hour average for the turbine in which any monitored parameter does not achieve the target value or is outside the acceptable range defined in the monitoring plan. Monitor downtime is a turbine operating hour in which any of the required parametric data are either not recorded or invalid. All reports must be postmarked by the 30th day following the end of each 6-month period. **(40 CFR 60.4375(a), 40 CFR 60.4380(c), 40 CFR 60.4395)**
2. The permittee shall provide written notification of construction and operation to comply with the federal Standards of Performance for New Stationary Sources, 40 CFR 60.7. The permittee shall submit this notification to the AQD District Supervisor within the time frames specified in 40 CFR 60.7. **(40 CFR 60.7)**
3. If the permittee is required to monitor the sulfur content in the fuel pursuant to 40 CFR 60.4360, the permittee shall submit excess emissions and monitor downtime in accordance with 40 CFR 60.7(c) and 60.4385. An excess emission is the turbine operating hour beginning on the date and hour that any sample shows an exceedance in the applicable sulfur limit and ending on the date and hour that a subsequent sample is taken that demonstrates compliance with the sulfur limit. Monitor downtime begins when a required sample is not taken by its due date or the date and hour that invalid results are obtained. Monitor downtime ends on the date and hour of the next valid sample. All reports must be postmarked by the 30th day following the end of each 6-month period. **(40 CFR 60.4375(a), 40 CFR 60.4385, 40 CFR 60.4395)**

VIII. STACK/VENT RESTRICTIONS

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter/Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SV-POWERGENERATION	60	74	R 336.1225, 40 CFR 52.21(c) & (d)

IX. OTHER REQUIREMENTS

1. If the permittee chooses to use a Predictive Emissions Monitoring System (PEMS) to monitor NOx emissions, the permittee shall follow the protocol delineated in the Environmental Protection Agency's (EPA) April 5, 2006, approval letter for GTP1. **(40 CFR Part 75 Subpart E, 40 CFR Part 75.66(d))**
2. If the permittee chooses to use a Predictive Emissions Monitoring System (PEMS) to monitor CO emissions, the permittee shall follow the protocol delineated in Performance Specification 16 in Appendix B of 40 CFR Part 60. **(40 CFR Part 60 Appendix B).**
3. The permittee shall comply with the provisions of the federal Standards of Performance for New Stationary Sources as specified in 40 CFR Part 60 Subpart A and Subpart KKKK, as they apply to EU-POWERGENERATION. **(40 CFR Part 60 Subparts A & KKKK)**

Footnotes:

¹This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

FLEXIBLE GROUP SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FGFACILITY	All process equipment source-wide including equipment covered by other permits, grand-fathered equipment and exempt equipment.	

The following conditions apply to:
FG-FACILITY

I. EMISSION LIMITS

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. CO	73.1 tpy	12-month rolling time period as determined at the end of each calendar month	FGFACILITY	SC VI.2	R 336.1205(3)
2. NOx	89.7 tpy	12-month rolling time period as determined at the end of each calendar month	FGFACILITY	SC VI.2	R 336.1205(3)

II. MATERIAL LIMITS

1. The distillate oil usage for FGFACILITY shall not exceed 1,878,261 gallons per year based on a 12-month rolling time period as determined at the end of each calendar month. **(R 336.1205(3))**
2. The natural gas usage for FGFACILITY shall not exceed 1,955,662 thousand cubic feet per year based on a 12-month rolling time period as determined at the end of each calendar month. **(R 336.1205(3))**
3. The fuel oil sulfur content shall not be greater than 0.1% sulfur by weight by initial fuel reservoir sampling, followed by sampling of each load of fuel oil added to fuel reservoirs or storage tanks. The sample shall be submitted for an independent analysis of the density; sulfur content, in percent by weight; and BTU per gallon utilizing ASTM Method D1552 or D4294 for sulfur content or other method approved by AQD. **(R 336.1205(1)(a))**
4. All natural gas combusted at this facility shall be pipeline quality natural gas. Pipeline natural gas is defined in 40 CFR Part 72 Section 72.2. **(R 336.1205(1)(a))**

III. PROCESS/OPERATIONAL RESTRICTIONS

NA

IV. DESIGN/EQUIPMENT PARAMETERS

NA

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

NA

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor by the last day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition. **(R 336.1205(1)(a))**
2. The permittee shall keep the following information on a monthly basis:
 - a. Fuel usage for all fuel-burning equipment in FG-FACILITY and equipment specific emission factors for all emission units of flexible groups at this facility
 - b. NOx and CO emissions on a monthly and rolling 12-month rolling time period basis.

The permittee shall keep the records in a format acceptable to the AQD District Supervisor. The permittee shall keep all records on file for a period of at least five years and make them available to the Department upon request. **(R 336.1205(1)(a))**

VII. REPORTING

NA

VIII. STACK/VENT RESTRICTIONS

NA

IX. OTHER REQUIREMENTS

NA

Footnotes:

¹This condition is state only enforceable and was established pursuant to Rule 201(1)(b).