

**TECHNICAL REVIEW AND EVALUATION FOR
UNS ELECTRIC, INC.
AIR QUALITY PERMIT NO. 52663**

I. COMPANY INFORMATION

This is a renewal permit for the continued operation of a peaking power plant for UniSource Energy Corporation (UNSE). This is a stationary facility located at 1741 North Grand Avenue in Nogales, AZ. This is a renewal of Operating Permit #32961. UNSE is a major source for Title V purposes, with potential emissions of nitrogen oxides (NO_x), carbon monoxide (CO), and sulfur dioxide (SO₂) each exceeding 100 tons per year.

A. Company Information

Facility Name: Valencia Power Plant

Mailing Address: 1710 North Mastick Way, Nogales, AZ 85621

B. Attainment Classification

This source is located in a non-attainment area for PM₁₀.

II. PROCESS DESCRIPTION

The UNSE Valencia Power Plant (VPP) is a peaking power plant currently operating four (4) simple cycle combustion turbine generator units, three supporting starter CI engines, and one emergency internal combustion engine.

The four combustion turbines located at the VPP include three Hitachi MS 5001 M-series units rated at 13.5 MW each and one General Electric LM2500 unit rated at 23 MW. Each of the combustion turbines can be fired on natural gas, distillate fuel oil, or a combination of the two fuels. Natural gas is supplied via a pipeline owned by El Paso Natural Gas (EPNG) that runs through Nogales. Distillate fuel oil is stored onsite in two 50,000-gallon storage tanks.

VPP utilizes water injection on each of the four combustion turbines to control NO_x emissions. Each of the combustion turbines is equipped with NO_x and CO continuous emission monitoring systems (CEMS) for the purpose of demonstrating compliance with 365-day rolling average emission limits voluntarily accepted to avoid major source status under the prevention of significant deterioration (PSD) regulations.

III. EMISSIONS

The VPP has the potential to emit regulated air pollutants, including nitrogen oxides (NO_x), carbon monoxide (CO), and sulfur dioxide (SO₂) in excess of the 100 ton-per-year Title V major source threshold. Enforceable emission limitations have been voluntarily accepted by VPP to limit NO_x, CO, and SO₂ emissions below applicable PSD major source thresholds. Unrestricted potential

emissions of all other PSD regulated pollutants are below major source thresholds. Nogales area in Santa Cruz County is designated nonattainment for PM₁₀. Potential emissions of PM₁₀ from the VPP are below 100 tons per year; therefore, the facility constitutes a minor source with respect to nonattainment NSR. The VPP is a minor source of hazardous air pollutants (HAP) emissions, with potential emissions below 10 and 25 tons per year for any single HAP and total combined HAPs, respectively. The VPP combustion turbines are designed to fire natural gas, distillate fuel oil, or a combination of both fuels. The potential to emit for the facility was calculated assuming all four combustion turbines operating continuously at peak heat input rates firing the highest-emitting fuel. Facility-wide potential to emit is summarized in Table 1 below.

TABLE 1: FACILITYWIDE POTENTIAL TO EMIT (PTE)

POLLUTANT	POTENTIAL EMISSIONS, TONS PER YEAR (tpy)**
CO	240*
NO _x	240*
SO ₂	200*
VOC	8.6**
PM ₁₀	63
PM _{2.5}	45.52
GHG	595,188**
Total HAP	4.75**

* VPP has voluntarily accepted limits on NO_x & CO emissions of 240 tons per year (365-day rolling total). For SO₂, a limit of 200 tons per year has been accepted, expressed as a 12-month rolling total.

** GHG PTE is based on 8,760 hours which is overestimated, since VPP is limited by 240 tpy CO/NO_x emission limits.

IV. LEARNING SITES IN VICINITY

In accordance with ADEQ's Environmental Permits and Approvals near Learning Sites Policy, the Department conducted an evaluation to determine if any nearby learning sites would be adversely impacted by the facility. Learning sites consist of all existing public schools, charter schools and private schools the K-12 level, and all planned sites for schools approved by the Arizona School Facilities Board. The learning sites policy was established to ensure that the protection of children at learning sites is considered before a permit approval is issued by ADEQ. The Department identified 16 learning sites within a two mile radius of the UNSE's facility located at 1741 N Grand Avenue, Nogales, AZ 85621.

In the year 2005, a dispersion modeling analysis was conducted by the Permittee to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) and the Arizona Ambient Air Quality Guidelines (AAAQGS). This modeling documented compliance with all applicable NAAQS and AAAQGS. Based on this, ADEQ has determined that the facility will not adversely

impact the learning sites.

V. COMPLIANCE HISTORY

Inspections are being regularly conducted at the VPP to ensure compliance with its applicable permit conditions. No cases or violations have been developed as a result of inspections.

VI. APPLICABLE REGULATIONS

As part of the Title V renewal and significant revision permit applications, the Permittee performed a regulatory review and identified air quality regulations applicable to the existing and proposed new emission units at the VPP. Table 2 summarizes the findings of the Department with respect to the applicability or non-applicability of specific regulations to emission units and emission units groups. Previous permit conditions are discussed under Section VI of this technical review document.

TABLE 2: APPLICABLE REGULATIONS

Unit ID	Start-up date	Control Equip.	Regulation(s)	Verification
Hitachi MS 5001 Gas Turbine Units P1, P2, & P3 13.5 MW Each	1988	Water Injection Systems	<u>NSPS Gen. Provisions</u> A.A.C R18-2-901(1), (2) 40 CFR 60 Subpart A NSPS Subpart GG	Gas Turbine Units P1, P2, P3, and P4 commenced construction after October 3, 1977 and have a heat input at peak load greater than 10.7 GJ/hr (10 MMBtu/hr). The units are subject to the NO _x and SO ₂ standards of 40 CFR Subpart GG and the associated general provisions in 40 CFR 60 Subpart A.
General Electric LM 2500 Gas Turbine Unit P4 20 MW	1987		<u>NSPS Subpart KKKK</u> 40 CFR 60.4300 and - 4420	This is applicable to stationary combustion turbines that commenced construction, modification or reconstruction after February 18, 2005. Combustion Turbine P4, though installed at the VPP in the year 2006, was manufactured in the year 1987. Therefore NSPS Subpart KKKK is not applicable.
			<u>NESHAP Subpart YYYY</u> 40 CFR 63.6080 - 63.6175	40 CFR 63 Subpart YYYY applies to stationary combustion turbines located at major sources of HAP emissions. As documented in Section III, the VPP is a minor source of HAP. Therefore, NESHAP/MACT standards are not applicable.
			<u>Acid Rain Program</u>	

Unit ID	Start-up date	Control Equip.	Regulation(s)	Verification
			A.A.C. R18-2-333 40 CFR 72 – 78	P4 Unit was manufactured in the year 1987 and was installed at VPP in the year 2006. P4 has a generating capacity of 23 MW. 40 CFR 72.6(b).2 states that ‘any unit that commenced commercial operation before November 15, 1990 and that did not, as of November 15, 1990, and does not currently, serve a generator with a nameplate capacity of greater than 25 MW is not an affected facility under Acid Rain program.’ Therefore, acid rain program is not applicable to VPP.
Emergency Diesel Generator Engine (EGEN)	2010	None	40 CFR 60, Subpart III NESHAP Subpart ZZZZ	New Source Performance Standards for Internal Combustion Engines (ICEs) are applicable. EGEN is termed as ‘New’ ICE since this it was manufactured after June 2006. As per 40 CFR 63.6590(c)(1), requirements of NESHAP Subpart ZZZZ are met by meeting the requirements of NSPS Subpart III.
Black start Engines BSP1, BSP2, and BSP3	1988	None	A.A.C. R18-2-719 NESHAP Subpart ZZZZ	Standards of Performance for Existing Stationary Rotating Machinery. NESHAP Subpart ZZZZ is applicable to these ICEs. These are categorized as ‘Existing CI Black start engines (<500 HP)’ in an area source under Subpart ZZZZ. Under Subpart ZZZZ, a black start engine is defined as an engine whose only purpose is to start up a combustion turbine. These engines meet this definition.
Fuel Oil Storage Tanks P8 and P9; 50,000 Gallons Each	1949 (P9) 1997 (P8)	None	A.A.C. R18-2-730 <u>NSPS Subpart Kb</u> 40 CFR 60.110b - 60.117b	Standards of Performance for Unclassified Sources. Fuel oil storage tank P8 was constructed after July 23, 1984 and has a capacity greater than 151 cubic meters. However, the maximum true vapor pressure of the fuel oil stored is less than 3.5 kPa, therefore, in accordance with 40 CFR 60.110b (b), the NSPS is not applicable.

Unit ID	Start-up date	Control Equip.	Regulation(s)	Verification
Mobile Sources	Not Applicable	Control Measures	A.A.C. R18-2-801 R18-2-802.A R18-2-804	These regulations are applicable to all mobile sources.
Fugitive Dust Sources	Not Applicable	Control Measures	A.A.C. R18-2-602 R18-2-604 R18-2-605.A R18-2-804.B	The regulations listed are applicable to non point sources.
Abrasive Blasting	Not Applicable	Wet blasting, enclosures or equivalent approved by Director	A.A.C. R-18-2-726	This standard is applicable to any abrasive blasting operation.
Spray painting operations	-	Enclosed area	A.A.C. R-18-2-727	This standard is applicable to any spray painting operation.
Demolition/renovation operations	-		A.A.C. R18-2-1101.A.8, Subpart M	This standard is applicable to any asbestos related demolition or renovation operations.

VII. PREVIOUS PERMITS AND CONDITIONS

A. Previous Permits

Table 3 lists the previous permits that have been issued to UNSE, Inc. for operation of VPP.

TABLE 3: PREVIOUS PERMITS

PERMIT NUMBER	DATE ISSUED	APPLICATION BASIS
32961	1/19/2006	Title V Operating Permit
50989	4/29/2010	Significant Revision

B. Previous Permit Conditions

The following is a discussion of the previous operating permit and subsequent revisions that

were issued to the source.

Title V Operating Permit #32961

Condition No.	Determination				Comments
	Revise	Keep	Delete	Stream-line	
Attachment "A"					
Att. A.	x				General Provisions - Revised to represent most recent permitting language
Attachment "B"					
I.		x			Facility wide requirements
II.A	x				General provisions revised by removing the initial notification and performance testing requirements for Unit P4.
II.B		x			Condition for 'Operational Limitations'.
II.C.1		x			Emission Limitations for NO _x
II.C.2		x			Air Pollution Control Requirements.
II.C.3.	x				Monitoring, recordkeeping, and reporting requirements revised since NSPS Subpart GG was revised in February, 2006.
II.C.4			x		Performance testing for gas turbines deleted since source has CEMS for emission monitoring.
II.C.5		x			Permit shield
II.D.1	x				Emission/Limitations for SO ₂ revised by adding applicable limits of NSPS Subpart GG.
II.D.2.a	x				Revised since NSPS Subpart GG was revised by EPA in February, 2006.
II.D.2.b		x			Annual SO ₂ Emission Limit
II.D.3		x			Permit Shield
II.E.1		x			Emission Limitations for CO.

Condition No.	Determination				Comments
	Revise	Keep	Delete	Stream-line	
II.E.2		x			Monitoring, Recordkeeping, and Reporting Requirements for CO.
II.F		x			Monitoring, Recordkeeping, and Reporting Requirements for annual NO _x and CO emission limits.
III		x			Fugitive Dust Requirements
IV		x			Mobile Source Requirements
V		x			Other Periodic Activities like abrasive blasting, use of paints, demolition and renovation

Significant permit revision #50989 to Title V Permit #32961

Condition No.	Determination				Comments
	Revise	Keep	Delete	Stream-line	
Attachment "B"					
VI.A	x				Applicability condition for ICEs revised
VI.B			x		Hourly limitation for EGEN has been deleted since facility wide emission of NO _x is limited to 240 tons per year on a 365-day basis.
VI.C.1, 2, 3, 5, and 6.		x			Operating Requirements for ICE
VI.C.4	x				Condition for fuel requirements for ICEs revised by removing requirements for 'before October, 2010.'
VI.D		x			Condition for emission limitations for ICE
VI.E		x			Condition for Monitoring and Recordkeeping Requirements
VI.F		x			Condition for Permit Shield

VIII. EMISSION LIMITS AND PERIODIC MONITORING

A. Gas Turbine Units P1, P2, P3, and P4

1. NO_x

The units are subject to the NO_x standard in NSPS Subpart GG, 40 CFR 60.332(a)(1). The permit contains a voluntarily accepted facility-wide emission limit of 240 tons per year of NO_x. This limit applies to the total combined emissions from Gas Turbine Units P1, P2, P3, P4, EGEN, and black start CI engines BSP1, BSP2, & BSP3 calculated as a rolling 365-day total.

The Permittee must operate CEMS and fuel flow rate monitoring systems which, in conjunction with the data acquisition and handling system (DAHS) be used to calculate total combined NO_x emissions from Gas Turbine Units P1, P2, P3, and P4; and calculate the emissions of NO_x from black start CI engines BSP1, BSP2, & BSP3 from the operating hour data and using respective emission factors to show compliance with the NO_x emission limitation.

2. SO₂:

The units are subject to the SO₂ standard in NSPS Subpart GG, 40 CFR 60.333(b), which requires that no fuel with a sulfur content in excess of 0.8 percent may be combusted in any gas turbine. The permit contains a more stringent fuel sulfur limitation of less than or equal to 0.2 percent, which was voluntarily accepted by UNSE. The permit also contains a voluntarily accepted facility-wide emission limit of 200 tons per year of SO₂. This limit applies to the total combined emissions from Gas Turbine Units P1, P2, P3, and P4, calculated as a rolling 12-month total.

Monitoring, recordkeeping, and reporting requirements for the fuel sulfur content limit are consistent with NSPS Subpart GG. For compliance demonstration with the annual SO₂ emission limit, the Permittee is required to use fuel sulfur specification data, fuel usage records, and approved emission factors to calculate total combined SO₂ emissions as a monthly 12-month total.

3. CO

The permit contains a voluntarily accepted facility-wide emission limit of 240 tons per year of CO. This limit applies to the total combined emissions from Gas Turbine Units P1, P2, P3, P4, EGEN, and black start CI engines BSP1, BSP2, & BSP3 calculated as a rolling 365-day total.

The Permittee must operate CEMS and fuel flow rate monitoring systems which, in conjunction with the DAHS be used to calculate total combined CO emissions from Gas Turbine Units P1, P2, P3, and P4; and calculate the emissions of CO from EGEN, black start CI engines BSP1, BSP2, & BSP3 from the operating hour data and using respective emission factors to show compliance with the CO emission limitation.

IX. COMPLIANCE ASSURANCE MONITORING

CAM is applicable to emission units at sources with uncontrolled potential emissions equal to or greater than 100 tons per year (10 & 25 tons per year for HAP) those are subject to a non-exempted emission limitation or standard and are equipped with a control device to achieve compliance with the subject limitation or standard. The gas turbine units at the VPP have potential emissions of NO_x, CO, and SO₂ in excess of 100 tons per year. There are no controls installed for CO and SO₂

emissions; therefore CAM does not apply to these two pollutants.

Gas Turbine Units P1, P2, P3, and P4 are subject to NO_x emission limitations associated with NSPS Subpart GG and PSD minor source status. The facility utilizes water injection systems for NO_x emission control on the turbines, making CAM potentially applicable to these pollutant-specific emission units. Under NSPS, two compliance monitoring approaches are available for NO_x emissions – Continuous water to fuel ratio monitoring or CEMS. For compliance demonstration with the annual NO_x emission limit, the permit specifies the use of CEMS and continuous fuel flow rate monitoring systems. Both continuous water to fuel ratio monitoring as prescribed in NSPS Subpart GG and CEMS qualify as “continuous compliance determination methods” as defined in 40 CFR 64.1. CEMS provide continuous data in the units of the standard with a consistent averaging period for the purpose of NSPS. CEMS in conjunction with fuel flow rate monitoring systems and calculations performed by the DAHS provide continuous data in the units of the applicable standard (tons per year) and with a consistent averaging period. Therefore, in accordance with 40 CFR 64.2(b)(1)(vi), CAM is not applicable to NO_x emissions from the gas turbine units.

X. INSIGNIFICANT ACTIVITIES

The following activities were proposed as insignificant by the Applicant and are approved as such by the Department.

Table 7: Insignificant Activity List

S. No.	Activity	Determination	Justification
1	Three Diesel Black Start CI Engines Day Tanks (100-Gallon each)	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.c- Diesel and fuel oil storage tanks with capacity less than 40,000 gallons.

XII. LIST OF ABBREVIATIONS

- A.A.C. Arizona Administrative Code
- ADEQ Arizona Department of Environmental Quality
- CAM Compliance Assurance Monitoring
- CEMS..... Continuous Emission Monitoring System
- CFR..... Code of Federal Regulations
- CO Carbon Monoxide
- DAHS..... Data Acquisition and Handling System
- EPA Environmental Protection Agency
- HAP Hazardous Air Pollutants
- Hr Hour
- ICE..... Internal Combustion Engine
- kPa Kilopascal
- MACT..... Maximum Achievable Control technology
- MMBtu..... Million British Thermal Units
- MW Megawatts
- NESHAP National Emission Standards for Hazardous Air Pollutants
- NO_x Nitrogen Oxide

NSPS.....	New Source Performance Standards
NSR.....	New Source Review
PM.....	Particulate Matter
PM _{2.5}	Particulate Matter Nominally less than 2.5 Micrometers
PM ₁₀	Particulate Matter Nominally less than 10 Micrometers
PSD.....	Prevention of Significant Deterioration
PTE.....	Potential-to-Emit
SO ₂	Sulfur Dioxide
TPY.....	Tons per Year
UNSE.....	UniSource Electric, Inc.
VOC.....	Volatile Organic Compound
VPP.....	Valencia Power Plant