

Filename: I:\wp11\permits\ENGREV\V20649.tsd.wpd
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Date: 9/15/11

Technical Support Document
Title V Permit Renewal
APS - Saguaro Power Plant
Permit # V20649.000

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**Technical Support Document
APS - Saguaro Power Plant**

This technical support document (TSD) summarizes some of the main items analyzed for this facility's original permit. More in-depth discussion can be found in previous TSDs from 2001-2010.

1. APPLICANT

Arizona Public Service Company
P.O. Box 53933, Mail Sta. 4535
Phoenix, Arizona 85072-3933

2. BACKGROUND

2.1 PROJECT LOCATION

This permit renewal pertains to an existing electrical power plant owned and operated by Arizona Public Service Company, located at Mile Post Marker 2265, I-10, Red Rock, Arizona. The SIC Code is 4911. The source is situated in an area classified as "attainment" for all pollutants.

2.2 PROCESS DESCRIPTION

The source consists of 5 electrical generating units, including 4 "grandfathered" generating units: 2 steam-electric units (Unit 1 & 2) nominally rated at 115 megawatt ("mW") and 105 mW, and two 55 mW Westinghouse W-501AA simple cycle gas turbine generators (CT1 & CT2). The steam-driven generators constitute the preferred steady-state producers, while the 55 mW gas turbine generators provide quick-start capacity. Those "grandfathered" generating units were installed between 1953 and 1973. As such, while those units fall subject to "existing source" performance standards, they antedates all applicable "new source" performance standards. Each steam unit includes a boiler, steam turbine-generator, and associated equipment. Two cooling towers are used to supply cooled circulating water to the unit condensers. The fifth unit is CT3, a GE 7EA simple cycle combustion turbine rated at 80 mW.

CT1 and CT2 may combust diesel oil, which is stored on site as a secondary fuel for the combustion turbines. The steam generating units may also combust residual oil or "bunker oil" as a secondary fuel. For units allowed to burn secondary fuels, there are no limitations on the extent of use of such secondary fuels. The permit currently allows the installation and operation of fogging systems on CT1 and CT2 but APS has not done so to date.

This source constitutes a major source of NOx and HAPs (if burning oil/diesel), and operates under authority of a "Title V" unitary permit. Since the steam and combustion turbines have not been modified or reconstructed, and the auxiliary generators fall subject to synthetic minor limitations, the facility does not have to go through Prevention of Significant Deterioration (PSD).

2.3 PERMITTING HISTORY

The Title V permit for this facility, V20601.000, was issued on 10/4/01. It included the requirements from previous installation permits A20501.000 and A20501.R02, and also authorized the installation and operation of the GE Frame 7EA once the 5 TM2500 units were removed.

Revision "V20601.R01", issued 1/22/2002, corrected an error in the original permit by increasing the allowable percentage of sulfur in the fuel for the steam generators from 0.8 to 0.9 percent.

Revision "V20601.R02" changed the basis for emissions averaging to assess compliance with the 7EA turbine emission caps from daily to monthly. In addition, requirements relating to photochemical reactive solvents are being removed. This requirements were deleted from SIP at 66 FR 49293 on 9/27/2001.

Renewal "V20627.000", issued 12/22/06, updated the list of Federally Enforceable Applicable Requirements, and the requirements applying to the TM2500 turbine units were removed since these units were replaced by CT3. In addition, this renewal authorized the installation and operation of an inlet fogging with overspray systems on the simple cycle turbines (CT1 and CT2).

2.4 COMPLIANCE/ENFORCEMENT HISTORY

The last inspection of this facility was conducted in July of 2009. The facility was in compliance.

The annual RATA tests were conducted in August 2009.

This facility does not have any history of compliance problems or enforcement.

2.5 CHANGES MADE DURING RENEWAL

3. EMISSIONS FROM THE PROJECT

3.1 ACTUAL EMISSIONS

2010 Emissions (TPY)						
CO	NOx	SOx	PM10	PM2.5	VOC	HAP
2.14	5.78	0.03	0.23	0.23	0.80	0.0

3.2 POTENTIAL EMISSIONS

Maximum Emission Summary (tons/year) - Potential to Emit

	SO ₂	NOx	PM ₁₀	CO	VOC	HAPs	CO _{2e}
Steam 1- Gas	3.49	987.56	44.15	139.42	31.95	0.68	683,432
Steam 1- Oil	5625.88	1274.09	323.71	199.08	30.26	21.98	995,379
Steam 2 -Gas	3.2	907.7	40.58	128.14	29.37	0.63	628,169
Steam 2 - Oil	4972.66	1126.15	286.12	175.96	26.75	19.43	879,805
CT1 - Gas	2.47	1315.45	27.13	337.08	8.63	3.84	452,187
CT1 - Diesel	201.71	3514.97	47.93	13.18	1.64	15.56	627,103
CT2 - Gas	2.47	1315.45	27.13	337.08	8.63	3.84	452,187
CT2 - Diesel	201.71	3514.97	47.93	13.18	1.64	15.35	627,103
CT3	0.7	39	13.5	70	2.2	3.84	449,681
TOTAL - 4 Oil/Diesel Turbines	11001.96	9430.18	705.69	401.40	60.29	72.32	3,129,390
TOTAL - Natural Gas	12.32	4565.161	152.49	1011.73	80.79	12.83	2,665,656
C.Tower 1			77.11			0.07	
C.Tower 2			77.11			0.07	
Diesel Tank #2					1.8		
Emergency Generator	0.01	0.17	0.01	0.04	0.01	0.0	

4. AIR QUALITY IMPACTS ANALYSIS

The following provides a summary of the facility-specific ambient impacts, as described in the technical support document for the original Title V permit issued on 10/01. **For a more in-depth explanation of the Impact Analysis, see the TSD from 2001.**

4.1 SO2 EMISSIONS

During the initial Title V permit review for this facility, PCAQCD performed a modeling analysis to assess the SO₂ emission impact from the steam units and the combustion turbines existing at the time (not CT3) when combusting secondary fuel. From that analysis, PCAQCD concluded that the fuel-sulfur content in the permit adequately assured that the facility itself would not cause a violation of the SO₂ ambient air quality standard. In addition, the Acid Rain sulfur dioxide allowances establish a practical constraint on this facility ever emitting anywhere near its SO₂ emission potential.

4.2 NOX EMISSIONS

PCAQCD performed a modeling analysis during the initial Title V permit review for this facility, to assess the NO_x ambient impacts from the “grandfathered” units, and concluded that this facility will not cause a violation of the NO_x ambient air quality standards. The table below shows the results.

4.3 PM10 EMISSIONS

PCAQCD performed a modeling analysis during the initial Title V permit review for this facility, to assess the PM₁₀ ambient impacts from the “grandfathered” units, and concluded that this facility will not cause a violation of the ambient air quality standards. The table below shows the results.

4.4 CO EMISSIONS

PCAQCD performed a modeling analysis during the initial Title V permit review for this facility, to assess the CO ambient impacts from the “grandfathered” units, and concluded that this facility will not cause a violation of the CO ambient air quality standards. The table below shows the results.

WORST-CASE AMBIENT IMPACTS

Pollutant	Max. Concentration (µg/m ³)	NAAQS average	Allowable Concentration (µg/m ³)	Actual/Allowable (%)
SO ₂	181.5	3-hr	1,300	14
SO ₂	25.8	24-hr	365	7.1
SO ₂	3.73	annual	80	4.6
NO _x	0.26	annual	100	0.26
CO	11.5	1-hr	40,000	0.03
CO	2.3	8-hr	10,000	0.02
PM ₁₀	1.71	24-hr	150	1.1
PM ₁₀	0.17	annual	50	0.3

Note: These impacts only reflect the emissions from the steam units 1 and 2, CT1 and CT2. However, CT3 will only add limited additional emissions, having a negligible impact on the values shown in the table.

WORST-CASE AMBIENT IMPACTS + BACKGROUND EMISSIONS

Pollutant	Max. Concentration (µg/m ³)	Background Concentration ¹ (µg/m ³)	Total Allowable (µg/m ³)	NAAQS Allowable (µg/m ³)	Maximum/Total/ Allowable (%)	
SO ₂ (3-hr)	182	21.3	203.3	1,300	1.6	15.6

¹ SO₂ background from www.epa.gov/air/data/monvals.html, based on lowest annual mean, lowest 2nd max. for 3-hr and 24-hr averages; there are no SO₂ monitors within about 40 miles of this facility. NO_x data taken at Saguro National Monument for years 1995 and 1996. PM₁₀ data taken at Coolidge for years 1995 through 1999. CO data taken at Casa Grande for years 1995 through 1997.

SO ₂ (24-hr)	25.8	8	33.8	365	2.2	9.3
SO ₂ (annual)	3.73	2.7	6.4	80	3.4	8.0
NO _x (annual)	0.26	14.2	14.5	100	14.2	14.5
CO (1-hr.)	11.5	2052	2064	40,000	5.1	5.2
CO (8-hr.)	2.3	1,368	1,370	10,000	13.7	13.7
PM ₁₀ (24-hr.)	1.71	104.5	106.2	150	69.7	70.8
PM ₁₀ (annual)	0.17	37.1	37.3	50	74.2	74.6

4.5 AIR TOXICS

During the initial Title V permit review, modeling of HAPS was conducted, and the results were compared with the Arizona Ambient Air Quality Guidelines. None of the AAAQGs were exceeded.

5. TITLE V PERMIT ANALYSIS

5.1 APPLICABLE REQUIREMENTS -GENERAL

The Saguaro Power Plant commenced operation in 1954. The plant, with the exception of CT3, antedates any installation permit, PSD or NSPS requirements. Permittee has accepted federally enforceable limits on emissions from CT3 in order to avoid PSD review.

The 2001 TSD includes an explanation of general facility-wide applicable requirements.

5.2. APPLICABLE REQUIREMENTS

5.2.1 REASONABLE PRECAUTIONS SIP APPROVED 4/6/10

This was already part of the Pinal County Code of Regulations but became SIP approved in 2010. Requires the applicant to take measures to prevent fugitive dust emissions.

5.2.2 COMPLIANCE ASSURANCE MONITORING (CAM) - 40 CFR 64

The CAM rule is applicable to pollutant-specific emissions units at major sources when the emission unit is subject to an emission limit or standard, the emission unit uses a control device to achieve compliance with such emission limit or standard, and the emission unit has potential pre-control device emissions equal or above major source thresholds.

As indicated in the renewal permit application (1/04/06), page 8-20, the potential pre-control device emissions for the steam units, CT1 and CT2 could potentially be subject to the CAM rule for one or more of the criteria pollutants and HAPs. However, since none of these units are equipped with control devices, CAM is not applicable. CT-3's pre-control device emissions are below the major source threshold, and therefore CAM is not applicable to this unit either.

5.2.3 MACT FOR TURBINES - 40 CFR 63 SUBPART YYYY

Subpart YYYY of 40 CFR 63 was promulgated on 3/5/04. It establishes national emission limitations and operational limitations for HAP emissions from stationary combustion turbines located at major sources of HAP emissions. The Saguaro facility has the potential to emit above major source threshold of HAPs.

Per 40§63.6090(a)(1), the turbines at this facility are existing, and in accordance with 63.6090(b)(4), these turbines do not have to meet the requirements of the subpart and of subpart A. No initial notification is necessary either.

5.2.4 NESHAP FOR ENGINES - 40 CFR 63 SUBPART ZZZZ

Subpart ZZZZ was last revised in August 2010. Since the emergency generator is located at a major source of HAPs, some of the requirements of the subpart apply, specifically those for emergency generators <500 hp located at major sources of HAPs. The generator is not limited to any emission rates but it is subject to maintenance requirements, recordkeeping and reporting requirements.

5.3 REGULAR COMPLIANCE REPORTING/PERFORMANCE TEST REPORTING

The steamer units and CT3 fall subject to the SO₂ and NO_x emission limitations of the Acid Rain Program, and must comply with the monitoring requirements fo 40 CFR Part 75 for SO₂, NO_x and CO₂. CT1 and CT2 are grandfathered, and one of these units will be tested for CO and NO_x to verify emission rates.

The permit includes a testing regime for CO and NO_x which is only triggered when emissions show that the facility is being utilized, or that secondary fuel is being used, above a 10% capacity factor. Otherwise, while the facility is not being utilized on a frequent basis, emission factors and parametric monitoring are used for compliance demonstrations.

Semi-annual reports required by the permit require sufficient information to adequately show compliance.

6. CONCLUSION

Based on the information supplied by Applicant and analyses conducted by the PCAQCD, PCAQCD concludes that the proposed project will not cause or contribute to a violation of any federal ambient air quality standard or cause any applicable PSD increment to be exceeded. Therefore, PCAQCD intends to issue to Applicant the renewal permit.