

STATEMENT OF BASIS

For the issuance of Draft Air Permit # 1987-AOP-R1 AFIN: 30-00337

1. PERMITTING AUTHORITY:

Arkansas Department of Environmental Quality
8001 National Drive
Little Rock, Arkansas 72219-8913

2. APPLICANT:

Hot Spring Power Company, LP
Hwy 270, 6 Miles West of Malvern
Malvern, Arkansas 72104

3. PERMIT WRITER:

Bryan Leamons

4. PROCESS DESCRIPTION AND NAICS CODE:

NAICS Description: Electric Power Generation
NAICS Code: 221112

5. SUBMITTALS:

August 30, 2005

6. REVIEWER'S NOTES:

Suez Energy Generation owns and operates Hot Spring Power Company, LP (HSPC) in Malvern, Hot Spring County, Arkansas. The cogeneration facility consists of two natural gas-fired combustion turbines with heat recovery steam generator (each equipped with fired duct burner) coupled with a single steam turbine and associated equipment. Cooling towers are also permitted.

This permit issuance completes renewal requirement of Arkansas Regulation 26 and 40 CFR Part 70. Modifications are incorporated with this permit. The facility is permitted to operate 40 CFR 60, Subpart Db affected duct burners (SN-01 and 02). The previous permit was issued for 40 CFR 60, Subpart Da affected duct burners at these units. Affected conditions are updated. Another modification involves HAP emission limits. Stack testing has shown that formaldehyde is slightly above what was previously permitted. Other HAPs are lower. Emission limits are updated accordingly. A permit shield is also added with this renewal.

Changes to the permit are also made in regards to updates to 40 CFR 60, Subpart GG. This rule has changed allowing alternatives to emission monitoring requirements. Affected conditions are updated.

40 CFR Part 64, Compliance Assurance Monitoring (CAM) is addressed for applicable units. There are no CAM affected units at the facility at this time. The combustion turbines/ duct burners (SN-01 and 02) are subject to Federal Acid Rain Requirements and are therefore exempted for CO and NO_x CAM requirements. Also, the catalytic oxidizers on SN-01 and 02 control pre-control VOC emissions that are below major source thresholds eliminating CAM requirements. The Auxiliary Boilers utilize low NO_x burner design and the cooling towers utilize drift eliminating baffle design for minimizing emissions. Equipment found on the Auxiliary Boilers and Cooling Towers are passive emissions reducing devices and are not considered “add-on” pollution control devices for the purposes of CAM. These units are therefore not subject to CAM.

A typographical error is corrected with this permit revision. Previously, the SN-01/SN-02 combined VOC limit was listed at 63.4 tons per year. This was an error; it should be 70.2 tons per year. This correction does not affect past regulatory applications, including BACT analysis. BACT would have been triggered in either case and the analysis was performed using the correct figures.

7. COMPLIANCE STATUS:

The following summarizes the current compliance of the facility including active/pending enforcement actions and recent compliance activities and issues. This facility is operating under CAO LIS 05-120 because they built NSPS Subpart Db affected duct burners but they had a permit for Da sized duct burners. The CAO allowed for the difference and this permit makes the necessary changes in permit conditions. The CAO also allows HSPC to test SN-01 and SN-02 with duct burners locked out of operations. If or when the duct burners are ever used the units will be re-tested.

8. APPLICABLE REGULATIONS:

PSD Applicability

Did the facility undergo PSD review in this permit (i.e., BACT, Modeling, etc.)?	N
Has the facility undergone PSD review in the past?	Y
Is the facility categorized as a major source for PSD?	Y
≥ 100 tpy and on the list of 28?	Y
≥ 250 tpy all other?	N

PSD Netting

Was netting performed to avoid PSD review in this permit?	N
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Source and Pollutant Specific Regulatory Applicability

Source	Pollutant	Regulation
SN-01 thru SN-02	VOC, CO, NO _x , and PM10	NSPS Subpart GG (NO _x and SO ₂ only) PSD (all pollutants listed) NSPS Db (NO _x only)

9. EMISSION CHANGES:

The following table summarizes plantwide emission changes associated with this permitting action.

Plantwide Permitted Emissions (tpy)			
Pollutant	Permit # 1987-AOP-R0	Permit #1987-AOP-R1	Change*
PM	239.8	239.8	0
PM ₁₀	239.8	239.8	0
SO ₂	13.2	13.2	0
VOC	63.4	70.2	6.8
CO	615.0	615.0	0
NO _x	294.6	294.6	0
1,3-Butadiene	0.02	0.5	0
Acetaldehyde	0.28	0.5	0
Acrolein	0.10	0.5	0
Benzene	0.06	0.5	0
Formaldehyde	0.48	3.8	3.3
Hexane	1.60	1.3	-0.3
Naphthalene	0.02	0.5	0
PAH	0.02	0.5	0
Propylene Oxide	0.20	0.5	0
Toluene	0.30	0.5	0
Xylene	0.10	0.5	0
Ammonia	311.6	311.6	0
Ammonium Sulfate	5.96	6.0	0

*some totals appear to have changed slightly but it is only due to the method used for rounding values during calculation. These changes were listed as 0. The VOC changed because of a typo in the previous version. HAPs change due to performance test results.

10. MODELING:

Criteria Pollutants

As part of the PSD permitting procedure a new source must perform an air quality analysis to assess impact to local NAAQS and to evaluate the increment consumption. The first step in this review is to evaluate the impact of pollutants that will increase by PSD significant levels. In this case, the pollutants evaluated are PM₁₀, NO₂, and CO. SCREEN3 dispersion modeling was used for various turbine load scenarios to determine worse-case operating rates for the pollutants screened. The pollutants were then modeled at these worse case conditions using ISCST3 modeling procedures. The dispersion modeling shows that these pollutants do not exceed PSD significant impact levels; therefore, multi-source refined modeling is not necessary to satisfy PSD requirements. The following table summarizes the highest-high results of dispersion modeling:

Pollutant		PSD Modeling Significant Impact	Impact from HS Power Project
PM ₁₀	annual	1	0.275
	24-hour	5	2.88
NO ₂	annual	1	0.359
CO	8-hour	500	23.8
	1-hour	2000	190.5

Ozone formation near the facility could result from the emissions of NO_x and VOCs. Scheffe Screening Tables are often used in this case as an initial step to estimating levels of ozone formation. In this case, the rural based ozone impact predicted by Scheffe tables is a negligible level because of the relatively low emission rates involved. It can therefore be assumed that the facility will have no noticeable impact on ozone formation.

Non-Criteria Pollutants:

An analysis was conducted to determine if emission rates of non-criteria pollutants associated with the facility trigger dispersion modeling requirements for any specific non-criteria pollutants. The analysis was conducted according to the Non-Criteria Pollutant Control Strategy. Contaminants with emission rates less than the Presumptively Acceptable Emission Rate (PAER) are exempt from dispersion modeling. Emission rates and PAER's for non-criteria pollutants associated with the facility are presented in the following table:

Non-criteria Pollutant	Emission Rate (lb/hr)	TLV (mg/m ³)	PAER* (lb/hr)	Modeling Required**
ammonia	91.6	17.4	1.91	Y
ammonium sulfate	4.4	0.5	0.055	Y
<u>VHAPS</u>				
1,3-Butadiene	<0.01	4.4	4.84	N
Acetaldehyde	ND	45	4.95	Y
Acrolein	0.026	0.23	0.025	N
Benzene	ND	32	3.52	N
Formaldehyde	0.98	1.5	0.165	Y
Hexane	0.46	176	19.36	N
Naphthalene***	<0.01	52	5.72	N
PAH	0.01	52	5.72	N
Propylene Oxide	0.05	48	5.28	N
Toluene	0.076	188	20.68	N
Xylene	ND	434	47.74	N

* PAER is the TLV of the HAP X 0.11

** If the proposed lb/hr is less than the PAER, then no further modeling is required.

*** Naphthalene used as representative POM

ND Some pollutants were not detectable during stack testing though the permittee chose to leave them in the permit limited to 0.1 lb/hr

This analysis shows that most non-criteria pollutants passed the first level of modeling (not ammonia, ammonium sulfate, and formaldehyde). These two species are modeled with ISCST3 dispersion methods to show compliance with the Presumptively Acceptable Impact Level (PAIL). PAIL is the maximum ambient 24-hour average concentration, for Hazardous Air Pollutants (HAPs), less than or equal to 1/100th of the Threshold Limit Value (TLV) or an acceptable concentration that has been established by the Department for each substance emitted. The ambient concentration resulting from the proposed emission rate of a substance is determined by using atmospheric dispersion models to obtain the maximum ambient, ground level concentration expressed as a 24-hour average.

Non-criteria Pollutant	Emission Rate (lb/hr)	TLV (mg/m ³)	PAIL (μg/m ³)	ISCST3 Result (μg/m ³)	Pass
ammonia	91.6	17.3	173	1.29	Y
ammonium sulfate	4.4	0.5	5	0.063	Y
formaldehyde	0.98	1.5	15	0.014	Y
acrolein	0.026	0.23	2.3	0.0003	Y

11. CALCULATIONS:

SN	Emission Factor Source	Emission Factor and Units	Control Equip. Type	Control Equipment Efficiency	Comments
01-02	Vendor data for criteria, and AP-42 for HAPs. 10 ppm for ammonia slip.	emission factors can be found in the permit BACT determinations	SCR, and low-NO _x oxidation catalyst	70% 22%	HAP testing showed some pollutants needed higher limit than AP-42 so they have been increased, others were non-detectable but have been left in the permit at 0.1 lb/hr
04-15	AP-42	see application	drift eliminator		0.0005 % drift 1500 ppmw TDS

12. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

SN	Pollutant	Test Method	Test Interval	Justification For Test Requirement
1 of SN-01 through 02	PM/PM ₁₀	5+201/202	5 yr	Confirmation of BACT limit(s)
	VOC	25A	5 yr	Confirmation of BACT limit(s)
1 of SN-01 through 02	NH ₃	206	5 yr	verify compliance
1 of SN-01 through 02	HAPs	18	initial	verify compliance if/when duct burners are started

13. MONITORING OR CEMS

The permittee must monitor the following parameters with CEMS or other monitoring equipment (temperature, pressure differential, etc.)

SN	Parameter or Pollutant to be Monitored	Method of Monitoring	Frequency	Report
01-02	NO _x	CEMS	Continuously	Y
	CO	CEMS	Continuously	Y

14. RECORD KEEPING REQUIREMENTS:

The following are items (such as throughput, fuel usage, VOC content, etc.) that must be tracked and recorded.

SN	Recorded Item	Limit	Frequency	Report
01-02	sulfur content of fuel	0.015% by volume at 15% oxygen on a dry basis	daily	Y
01-02	combined hours of duct burner fire	5,000 hr/yr total	monthly	Y
04-15	TDS	1280 ppmw	monthly	Y

15. OPACITY:

SN	Opacity	Justification	Compliance Mechanism
01-02	5%	Dept. Standard while firing natural gas	Use of natural gas
04-15	20%	Standard for cooling towers	TDS limit

16. DELETED CONDITIONS:

Former SC	Justification for removal
16, 21	NOx and CO testing has been completed, CEMS will show continuing compliance

17. VOIDED, SUPERCEDED, OR SUBSUMED PERMITS:

List all active permits voided/superceded/subsumed by the issuance of this permit.

Permit #
1987-AOP-R0

Permit #: 1987-AOP-R1

AFIN: 30-00337

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18. CONCURRENCE BY:

The following supervisor concurs with the permitting decision.

Phillip Murphy, P.E.