

STATEMENT OF BASIS

For the issuance of Draft Air Permit # 1987-AOP-R2 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, LLC
Hwy 270, 6 Miles West of Malvern
Malvern, Arkansas 72104

3. PERMIT WRITER:

Ann Sudmeyer

4. PROCESS DESCRIPTION AND NAICS CODE:

NAICS Description: Electric Power Generation
NAICS Code: 221112

5. SUBMITTALS:

December 18, 2006

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 permitting action is necessary to:

1. Increase the acetaldehyde and benzene hourly emission rate limits from 0.1 lb/hr to 0.5 lb/hr for SN-01 and SN-02;
2. Increase the acetaldehyde, benzene, and xylene annual emission rate limits for SN-01 and SN-02;
3. Modify Specific Condition #31 to allow for the use of continuous emission monitoring systems to determine compliance with the NO_x emission limits of §60.44b(a)(4);

4. Add other applicable provisions of 40 CFR Part 60, Subpart Db;
5. Specify rolling or block average for Specific Conditions #3, 9, 13, 15, 18, and 20; and
6. Specify 24-hr average as the averaging period for Specific Condition #20.

The total permitted annual emission rate limit increases associated with this modification include: 3.9 tons per year (tpy) acetaldehyde, 3.9 tpy benzene, and 0.5 tpy xylene.

Stack testing has shown that acetaldehyde is above the previous permit limit and benzene is at the permit limit. Therefore, the facility is requesting the hourly limits for these two pollutants to be increased.

7. COMPLIANCE STATUS:

The following summarizes the current compliance of the facility including active/pending enforcement actions and recent compliance activities and issues.

The last inspection for this facility was conducted on August 23-25, 2006 and showed them to be out of compliance for: exceeding the CO BACT limit of 12 ppmvd at 15% O₂ on a 24-hr average at SN-01; exceeding the NO_x BACT limit of 3.5 ppmvd at 15% O₂ at SN-01 and SN-02; exceeding the NO_x NSPS limit of 0.2 lb/MMBtu at SN-02; failing the acetaldehyde stack test; failing to provide upset conditions for exceeding emission limits outside of the 4 hour startup period; failing to conduct TDS testing on cooling towers; and failing to maintain records on TDS testing on cooling towers. The enforcement section plans to write a CAO for the violations. Based on the data attached to the inspection report, it appears that the facility was not out of compliance for the CO ppmvd limit (24-hr rolling average) for the 9th, 10th, and 11th hours of 9-1-05 at SN-01; the NO_x ppmvd limit (24-hr rolling average) for the 14th hour of 11-10-05 at SN-01; and the NO_x ppmvd limit (24-hr rolling average) for the 12th hour of 5-21-06 at SN-02 since the source was still in start-up for the 24-hr rolling average. It also appears that SN-01 was not out of compliance at the 10th hour of 8-5-05 for the NO_x ppmvd limit (24-hr rolling average) since the value indicated was the 1-hr average and not the 24-hr rolling average.

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 PM ₁₀	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-R1	Permit #1987-AOP-R2	Change*
PM	239.8	239.8	0
PM ₁₀	239.8	239.8	0
SO ₂	13.2	13.2	0
VOC	70.2	70.2	0
CO	615.0	615.0	0
NO _x	294.6	294.6	0
1,3-Butadiene	0.5	0.5	0
Acetaldehyde	0.5	4.4	3.9
Acrolein	0.5	0.5	0
Benzene	0.5	4.4	3.9
Formaldehyde	3.8	3.8	0
Hexane	1.3	1.3	0
Naphthalene	0.5	0.5	0
PAH	0.5	0.5	0
Propylene Oxide	0.5	0.5	0
Toluene	0.5	0.5	0
Xylene	0.5	1.0	0.5
Ammonia	311.6	311.6	0
Ammonium Sulfate	6.0	6.0	0

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

Non-criteria Pollutant	Emission Rate (lb/hr)	TLV (mg/m ³)	PAER* (lb/hr)	Modeling Required**
<u>VHAPS</u>				
1,3-Butadiene	<0.01	4.4	4.84	N
Acetaldehyde	1.0	45	4.95	N
Acrolein	0.026	0.23	0.025	N
Benzene	1.0	1.59	0.175	Y
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	0.2	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
benzene	1.0	1.59	15.9	0.08801*	Y

*AERMOD result. Benzene was the only pollutant with an increase in hourly emission rate and did not pass the PAER for 1987-AOP-R2. All other pollutants listed were modeled under previous permit revisions.

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. Acetaldehyde and benzene emission rates are based on testing	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
Part of 31c	Removed parts of this condition and replaced with the wording contained in the regulation.

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17. VOIDED, SUPERCEDED, OR SUBSUMED PERMITS:

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

Permit #
1987-AOP-R1

18. CONCURRENCE BY:

The following supervisor concurs with the permitting decision.

David Triplett, P.E.