

ATTACHMENT J-1 AMENDMENT

Addendum to SPECIFICATION NO. K90032, Steam Vacuum System NOx Emission Reduction System, is provided:

**SVS NOx Emission Reduction System Specifications Amendment
05-17-2011**

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1.1.1 Submittal description (add the following)

All construction documents such as submittals, Requests For Information (RFIs), daily reports, field clarifications, schedules, and change orders, shall be submitted and approved electronically using NASA's SharePoint Portal. Adobe Digital signatures shall be the legal equivalent to pen and ink signatures. A free version of Adobe Acrobat reader will suffice for all reviewers and most readers. A recent version of Adobe Acrobat Pro, compatible with Adobe Acrobat Pro Version 9, is required to upload submittals and RFIs.

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1.6.1 through 1.6.7 (add the following)

All submittals shall be in electronic format submitted through NASA's SharePoint Portal.

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3.1 Instructing operating personnel (replace with the following)

Upon completion of work and at time designated by contracting officer , provide services of manufacturer's technical representative for period of not less than one 4-hour working day for instruction of government operating personnel in proper operation and maintenance of equipment.

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1.8.1 b (add the following)

A stack analysis shall be performed to model the exposure levels.

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1.10 Emissions Monitoring

a. (add the following)

Currently BAAQMD has approved the Horiba model –VA-3000 CEMS.

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3.5.1 System performance test (add the following)

Electricity, water and test conditions shall be furnished by the government.

Attachment 1 - Arc Jet Test Schedule/Performance Requirements for Design of Nox Emission Reduction System

	Maximum		Typical		Minimum	
	Current	Future	Current	Future	Current	Future
Arc Jet Test Days per Year	160	160	160	160	120	120
Total SVS Operating Time (standby plus testing), hrs/day	8	8	6	6	2	2
Frequency of Tests	1 per day/3 per day 5 days per week	1 per day 3 days per week	4 per day 5 days per week	3 per day 3 days per week	2 per day 2 days per week	2 per day 2 days per week
Duration of Tests	1 hr/15 min	30 min	15 min	15 min	5 min	5 min
Inflow Conditions						
Test Gas Mass Flow, kg/sec	2.1	4.5	0.07-0.7	0.5-2.0	0.02	0.2-0.4
NOx Concentration, ppmv	63,000	63,000	30,000	30,000	1,000	1,000
NO Mass Flow, kg/sec	0.137	0.294	0.00218-0.0218	0.0155-0.0621	0.0000207	0.000207-0.000414
Added Steam, kg/sec	3.15	6.75	0.105-1.05	0.75-3.0	0.03	0.3-0.6
Pressure, bar	1.005	1.005	1.005	1.005	1.005	1.005
Temperature, °F (°C)	195 (90.6)	195 (90.6)	195 (90.6)	195 (90.6)	195 (90.6)	195 (90.6)
Outflow Conditions						
Treated Gas NOx	<4.54 kg/day	<4.54 kg/day	<4.54 kg/day	<4.54 kg/day	<4.54 kg/day	<4.54 kg/day
Spent Scrubber Solutions	<5,000 mg/L TDS	<5,000 mg/L TDS	<5,000 mg/L TDS	<5,000 mg/L TDS	<5,000 mg/L TDS	<5,000 mg/L TDS
Note 1: The test gas is air. Use mass composition 76.85% N ₂ /Inerts and 23.15% O ₂ . Use molar composition 79.05% N ₂ /Inerts and 20.95% O ₂ . Use average molecular weight 28.97 kg/kg-mole.						
Note 2: There is no net change in molar flow in the arc jet – N ₂ + O ₂ ⇌ 2NO						
Note 3: The test gas exiting the arc jet is dry. Passing through the SVS, the test gas becomes saturated with water vapor.						
Note 4: BACT trigger point is 4.54 kg NOx per day, prefer to stay below the trigger point.						
Note 5: Spent scrubber solutions discharge to city sewer, must be <5,000 mg/L TDS						

(End of Amendment)