



# K A N S A S

RODERICK L. BREMBY, SECRETARY

KATHLEEN SEBELIUS, GOVERNOR

DEPARTMENT OF HEALTH AND ENVIRONMENT

## **AIR EMISSION SOURCE REVISED CONSTRUCTION PERMIT**

**Source ID No.:** 0550087

**Effective Date:** October 8, 2002 (Amended April 5, 2004)

**Revised Date:** June 16, 2005

**Source Name:** Sand Sage Power, LLC Holcomb Unit #2

**NAICS:** 221112, Fossil fuel power generation (SIC 4911)

**Site Location:** Holcomb, Kansas

**Site Owner/Operator Name:** Sand Sage Power, LLC

**Site Owners/Operators  
Mailing Address:** 301 West 13th Street  
Hays, KS 67601

**Contact Person:** Mr. Wayne Penrod  
Senior Manager, Environment/Production Planning  
Telephone Number (620)-272-5418

**This permit is issued pursuant to K.S.A. 65-3008 as amended.**

### **Description of Activity Subject to Air Pollution Control Regulations**

Sand Sage Power, LLC is proposing to install and operate a new 660-megawatt coal-fired generating unit (Holcomb2) with associated coal, lime, auxiliary boiler, ash handling equipment, and a new cooling tower at the site adjacent to the existing Holcomb #1 unit owned by Sunflower Electric Power Corporation. While there may be some new

DIVISION OF ENVIRONMENT  
Bureau of Air & Radiation  
Air Construction/Operating Permits & Compliance Section  
CURTIS STATE OFFICE BUILDING, 1000 SW JACKSON ST., STE 310, TOPEKA, KS 66612-1366  
Voice 785-296-1570 Fax 785-291-3953 <http://www.kdhe.state.ks.us>

equipment requirements, much of the existing coal, lime, and ash handling equipment will be utilized by the new unit with addition of conveyors, etc. This equipment was designed and installed in accordance with appropriate NSPS standards when the original Holcomb #1 unit was constructed prior to 1983.

The proposed addition will be subject to the requirements of 40 CFR 52.21, Prevention of Significant Deterioration (PSD) as adopted under K.A.R. 28-19-350. It is a new source for which at least one regulated pollutant is emitted in excess of the PSD significant emission levels. The coal-fired boiler will be subject to the requirements of 40 CFR Part 60, Subpart Da, Standards of Performance for Electric utility Steam Generating Units for which Construction Commenced after September 18, 1978. The coal handling system additions will be subject to the requirements of 40 CFR Part 60, Subpart Y, Standards of Performance for Coal Preparation Plants. The auxiliary boiler will be subject to the requirements of 40 CFR 60, Subpart Db, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units. Holcomb2 is an affected source subject to Title IV of the Federal Clean Air Act. The monitoring system, as required by Title IV and other applicable regulations, may be used to satisfy some of the monitoring requirements of 40 CFR Part 60, Subpart Da as specified therein.

Emissions of oxides of nitrogen (NO<sub>x</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), volatile organic compounds (VOC), particulate matter (PM), particulate matter less than 10 microns in diameter (PM<sub>10</sub>), and lead were evaluated for this permit review. This project is subject to the provision of K.A.R. 28-19-300 (Construction permits and approvals; applicability) because the potential-to-emit of NO<sub>x</sub>, CO, SO<sub>2</sub>, VOC, PM, and PM<sub>10</sub> exceeds 40, 100, 40, 40, 25, and 15 tons per year, respectively.

An air dispersion modeling impact analysis, an additional impact analysis, and a Best Available Control Technology (BACT) determination were conducted as a part of the construction permit application process.

The primary purpose of this revision is to clarify the terms and conditions relating to particulate matter less than 10 microns in diameter (PM<sub>10</sub>) emission limitations.

### **Significant Applicable Air Pollution Control Regulations**

The main boiler (Holcomb2), auxiliary boiler, the coal handling equipment, and the lime storage/handling system, as proposed, are subject to Kansas Administrative Regulations relating to air pollution control. The following significant Kansas air quality regulations were determined to be applicable to this source:

K.A.R. 28-19-11 Exceptions Due to Breakdown or Scheduled Maintenance

K.A.R. 28-19-31 Emissions Limitations

K.A.R. 28-19-650 Opacity Requirements

K.A.R. 28-19-275 Special Provisions; Acid Rain Deposition

K.A.R. 28-19-300 Construction permits and approvals; applicability

K.A.R. 28-19-720 New Source Performance Standards, which adopts 40 CFR Part 60 Subpart Da, Db, and Subpart Y.

### **Air Emission Unit Technical Specifications**

The following equipment or equivalent is approved:

1. One coal-fired steam generator, Holcomb2, is to be equipped with low-NOx burners, separated over-fire air (SOFA) and selective catalytic reduction (SCR) to control NOx emissions, dry flue gas desulfurization (dry FGD) to control SO<sub>2</sub> emissions, and a dry fabric-filter system to control particulate emissions. Maximum design fuel input shall be 6,501 million BTUs per hour (MMBtu/hr). Maximum fuel sulfur content will be 0.60 percent on an average annual basis. Fuel shall be powder river basin (PRB) sub-bituminous coal.
2. Additions and improvements to the existing coal unloading, storage, handling and feed system, if any, shall be designed to meet the requirements of 40 CFR 60 Subpart Y.
3. Additions and improvements to the existing ash transport, loading, storage, and handling systems, if any, shall be designed to meet the requirements of K.A.R. 28-19-650.
4. Additions and improvements to the lime unloading, storage, transfer, and preparation systems, if any, shall be designed to meet the requirements of K.A.R. 28-19-650.
5. Additions and improvements to the ferric sulfate and soda ash storage and handling systems, if any, shall be designed to meet the requirements of K.A.R. 28-19-650.
6. One gas-fired auxiliary boiler with low-NOx burners. Maximum design heat input shall be 200 MMBtu/hr. Fuel shall be pipeline quality natural gas.
7. One cooling tower sufficient to service the Holcomb2 unit shall be designed with efficient commercially available mist eliminators to reduce aerosol and particulate emissions from the tower.

**Air Emissions Estimates from the Proposed Activity**

Pollutant Type	Post Permit Potential-To-Emit (Tons per Year) <sup>1</sup>
Nitrogen Oxides (NOx)	2286
Carbon Monoxide (CO)	4278
Sulfur Dioxide (SO <sub>2</sub> )	3417
Volatile Organic Compounds (VOC)	99.7
Particulate Matter (PM/PM <sub>10</sub> )	545.5/1115
Elemental Lead	<0.6
Individual HAP	<10
Combined HAPs	<25

**Air Emission Limitations**

1. K.A.R. 28-19-650(a)(3): Opacity of visible emissions at the outlet of any installed control device shall not exceed 20 percent.

2. Holcomb2 Main Boiler:

On and after the required performance tests referenced in 40 CFR Part 60 and K.A.R. 28-19-212, the emissions of each pollutant that is expressed as lbs/mmBtu shall not exceed the limit referenced hereunder. Test requirements and compliance with this standard is described in the section entitled Compliance and other Performance Testing.

a. The operator of the source shall not emit or cause to be emitted any NOx emissions exceeding 0.08 pounds per million BTU heat input (lb/MMBtu) on a 30-day rolling average, excluding periods of startup, shutdown, and malfunction.

<sup>1</sup> Potential-to-emit estimates are based on operation at full capacity for 8760 hours per year while in compliance with all conditions of this permit.

- b. During the first 18 months following initial startup, the unit shall not emit or cause to be emitted any NO<sub>x</sub> emissions exceeding 0.12 lb/MMBtu on a 30-day rolling average, excluding periods of startup, shutdown, and malfunction, in lieu of the 0.08 lb/MMBtu limit in item (2a). During this period, the owner or operator must operate and maintain the SCR system and demonstrate “best practices” to achieve 0.08 lb/MMBtu. Best practice includes but is not limited to, evaluation of control equipment capabilities and characteristics to assure proper and effective operation, effective evaluation of catalyst efficiency, evaluation of CEM data to assure optimal process and control equipment operation for practical reduction of NO<sub>x</sub> emissions, and data obtained from evaluations conducted at similar facilities.

If the unit and similar units burning PRB coal at other facilities are unable to achieve 0.08 lb/MMBtu, the limit shall be subject to revision in coordination with KDHE and the U.S. EPA, after opportunity for public comment .

- c. The operator of the source shall not emit or cause to be emitted any SO<sub>2</sub> emissions exceeding 0.12 lb/MMBtu on a 30-day rolling average. Such limitation shall not apply during periods of startup and shutdown, or when emergency conditions defined in 40 CFR 60.41a exist and the procedures under 40 CFR 60.46a(d) are implemented.
- d. Emissions of PM<sup>2</sup> shall not exceed 0.015 lb/MMBtu, averaged over the period of three (3) runs of at least 120 minutes in duration, excluding periods of startup, shutdown, and malfunction.
- e. Initially, emissions of PM<sub>10</sub><sup>3</sup> shall not exceed 0.035 lb/MMBtu, averaged over the period of six (6) runs of at least 120 minutes in duration, excluding periods of startup, shutdown, and malfunction. If the initial performance test demonstrates that an emissions limitation of 0.018 lb/MMBtu is consistently achievable, this limitation shall supersede the initial PM<sub>10</sub> emission limitation of 0.035 lb/MMBtu.
- f. If the initial performance test does not indicate that a PM<sub>10</sub> emissions limitation of 0.018 lb/MMBtu is consistently achievable, then either the emissions limitation indicated by the initial performance test, contingent upon approval by KDHE, shall be incorporated into a revised permit, or additional testing shall be accomplished (in accordance with "Compliance

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<sup>2</sup> The term “PM” as used in this permit means that particulate matter emitted by the Holcomb2 boiler that can be quantified by analysis under Reference Method 5 set forth in Appendix A of 40 C.F.R. Part 60.

<sup>3</sup> The term “PM<sub>10</sub>” as used in this permit means that particulate matter (existing as solid, liquid, and gaseous form) emitted by the Holcomb2 boiler that can be quantified by analysis either under Reference Method 5 and 202 or under 201 (or 201A) and 202 or as approved by both KDHE and Region VII of the U.S. EPA.

and other Performance Testing" Paragraphs 7 and 8 below) to determine the revised emissions limitation. Additional testing, if done, shall be accomplished in 12 months from the date of completion of the initial

performance test. Thereafter a new emissions limitation shall be determined by KDHE and incorporated into a revised permit, with such new emissions limitation to be deemed effective as of the date of the initial performance test.

- g. Emissions of Volatile Organic Compounds (VOC) shall not exceed 0.0035 lb/MMBtu, averaged over the period specified in the test protocol approved by KDHE, excluding periods of startup, shutdown, and malfunction. If the VOC and NO<sub>x</sub> emission limits cannot be achieved simultaneously, the NO<sub>x</sub> emission limit shall take precedence and a new VOC BACT emission limit shall be established by KDHE after opportunity for public comment, based on a review of performance test results.
- h. Emissions of Carbon Monoxide (CO) shall not exceed 0.15 lb/MMBtu, averaged over the period specified in the test protocol approved by KDHE, excluding periods of startup, shutdown, and malfunction. If the CO and NO<sub>x</sub> emission limits cannot be achieved simultaneously, the NO<sub>x</sub> emission limit shall take precedence and a new CO BACT emission limit shall be established by KDHE after opportunity for public comment, based on a review of performance test results.
- i. Total elemental Lead (Pb) portion of Lead compounds' emissions shall not exceed 0.136 lbs/hr, averaged over the period specified in the test protocol approved by KDHE.

NSPS standards referenced in 40 CFR 60, Subpart Da apply limits to the emission of NO<sub>x</sub>, SO<sub>2</sub> and PM to this boiler. The limits expressed above in Conditions 2.a, 2.c, and 2.d are more restrictive than these requirements, thus no NSPS emission limits are included in this permit.

3. Coal System:

40 CFR Part 60, Subpart Y limits visible emissions from any new or modified coal handling equipment to 20 percent opacity.

4. Ash System:

K.A.R. 28-19-650 limits visible emissions from any new or modified ash system equipment to 20 percent opacity.

5. Lime System:

K.A.R. 28-19-650 limits visible emissions from any new or modified lime system equipment to 20 percent opacity.

6. Cooling Tower:

The cooling tower will be equipped with commercially available high efficiency mist eliminators with a maximum total liquid drift not to exceed 0.002 percent of circulating water flow rate. Compliance with this requirement is demonstrated by maintaining records of the vendor-guaranteed maximum total liquid drift. No chromium-based water treatment chemicals will be used in the circulating water system and thus the requirements of 40 CFR 63, Subpart Q shall not apply.

Emissions of total dissolved solids in the cooling tower circulating water shall not exceed 9,000 ppm by volume.

**Permit Conditions**

1. Coal handling equipment, either newly constructed or modified, if any, shall be enclosed and vented to a baghouse with a 99% manufacturers guarantee control efficiency.
2. Newly constructed or modified systems for use of fly ash, lime, ferric sulfate and soda ash systems, if any, shall be enclosed and vented to a baghouse with a 99% manufacturers guarantee control efficiency.
3. The baghouses for the newly constructed or modified equipment shall be in place and continuously operating to control emissions of PM and PM<sub>10</sub> whenever the equipment is in operation. Maintenance and repair of the baghouses shall be conducted in a manner to minimize emissions.
4. A written pollution control equipment maintenance plan will be developed, implemented and maintained for the referenced baghouses.
5. The total fuel consumed in the auxiliary boiler shall not exceed 175,000 MCF/calendar year. NSPS emission standard for NO<sub>x</sub> referenced in 40 CFR Part 60, Subpart Db does not apply for boilers of less than 250 MMBtu/hr operated at an annual capacity factor of less than 10% (40 CFR 60.44b(k)) while firing natural gas. Should the owner or operator ever exceed the 10% annual capacity factor (uses more than 175,000 MCF/calendar year), the schedule for starting the initial performance test would commence as soon as the exceedance occurred .
6. The pre-controlled emission rate of sulfur dioxide (SO<sub>2</sub>), as measured at the scrubber inlet, for Holcomb2 shall not exceed 1.65 lbs SO<sub>2</sub>/MMBtu.

## Compliance and Other Performance Testing

1. Within 60 days after achieving the maximum production rate at which the Holcomb2 boiler will be operated, but not later than 180 days after initial start-up, the owner or operator shall conduct performance tests to demonstrate compliance with the applicable conditions and limitations set forth in this permit for CO, VOC, and PM and furnish KDHE a written report of the results of such performance tests.
2. Within 60 days after achieving the maximum production rate at which the Holcomb2 boiler will be operated, but not later than 180 days after initial start-up, the owner or operator shall conduct Method 9 performance test(s) to demonstrate compliance with the opacity limitations set forth for the new or modified coal, lime and ash handling equipment and furnish KDHE a written report of the results of such performance test(s).
3. Within 18 months after initial start-up of the Holcomb2 boiler, the owner or operator shall conduct performance test(s) to demonstrate compliance with the applicable conditions and limitations set forth in this permit for elemental lead and shall furnish to KDHE a written report of the results of such performance test(s). During this time frame, the owner or operator shall conduct performance tests to verify that HAP emissions do not exceed 10 tons per year of any individual HAP or 25 tons per year of combined HAPs. Compliance with the HAPs limits shall be demonstrated using the formula:  
$$ER * 8760 * 1/2000 < \text{Threshold}$$

where:

ER	=	the hourly emission rate (in pounds per hour) measured during performance test averaged over the period of the performance test.
8760	=	hours per year.
1/2000	=	ton per pounds.
Threshold	=	10 tons per year of individual HAP. 25 tons per year of combined HAPs*.
	*	Those HAPs to be measured for purposes of determining emissions of combined HAPs shall be included in the testing protocol approved by KDHE.

4. Within 60 days after achieving the maximum production rate at which the Holcomb2 boiler will be operated, but not later than 180 days after initial start-up, the owner or operator shall demonstrate compliance with the cooling tower total dissolved solids concentration limit and furnish KDHE a written report of the results of such performance test(s). For the six (6) months thereafter, the owner or operator shall perform monthly analyses to verify the limitation is not exceeded. Once this has been verified, the analyses shall be performed semiannually.

5. Continuous monitoring systems and monitoring devices required shall be installed and operational prior to conducting compliance performance tests under 40 CFR 60.8. Verification of operational status, at a minimum, include completion of the manufacturer's written requirements or recommendations for installation, operation, and calibration of the devices as required by 40 CFR 60.13.
6. In conducting the compliance performance tests required by this permit, the reference test methods and procedures outlined in K.A.R. 28-19-212 and 40 CFR 60.48a shall be used to demonstrate compliance with the limitations and conditions set forth in this permit.
7. Within 180 days after commencing commercial operation, the owner or operator shall conduct a performance test of PM<sub>10</sub> emissions and furnish KDHE a written report of the results of such test within 60 days of completion of said test. If, after evaluating the test data, the report reasonably concludes that the emissions limitation of 0.018 lb/MMBtu for PM<sub>10</sub> in Condition 2.e. of the Air Emissions Limitations section above may not be achievable, then the owner or operator may perform additional testing to determine an emission limitation for PM<sub>10</sub> that the boiler can and should be able to consistently comply with such limit while operating in a manner of good operating practices and regularly scheduled maintenance of the boiler, pollution control equipment and ancillary equipment.
8. If the owner or operator requests that the PM<sub>10</sub> emissions limitation be adjusted through additional testing, it shall include within the report required by Paragraph 7, a complete plan for establishing a PM<sub>10</sub> measurement protocol, including the method(s), number of test runs, and a tentative timeline, not to exceed 12 months, necessary to establish by appropriate statistical methods the new PM<sub>10</sub> emissions limitation for the unit under the range of normal operating conditions. Such plan shall include a requirement for quarterly reporting, to include an analysis of test results, unit operating parameters, air pollution control device operating parameters, fuel conditions, and other such matters as might influence the test results.

In due course thereafter, KDHE shall take measures to adjust the PM<sub>10</sub> emissions limitation to that which is determined by the test results, as follows: KDHE shall establish a revision to the PM<sub>10</sub> emissions limitation for Holcomb2 which: (i) insures that there will be no exceedence of either the NAAQS nor the PSD increment consumption allowance for PM<sub>10</sub>, (ii) is based upon a statistical analysis, and (iii) is consistently achievable on a sustained and long term basis with the exercise of due care and good operating practices.

## **Monitoring Requirements**

1. Within 60 days after achieving the maximum production rate at which the Holcomb2 boiler will be operated, but not later than 180 days after initial start-up of the boiler, the owner or operator of the Holcomb2 unit shall install and operate a continuous monitoring system to monitor and record emissions of SO<sub>2</sub>, and NO<sub>x</sub> as required by 40 CFR 60.47a (including paragraph (k)) and of opacity or alternatives to monitoring procedures or requirements approved by the Administrator of the U.S. EPA pursuant to 40 CFR 60.13(i).
2. All continuous monitoring systems required by 40 CFR Part 60 shall meet the applicable requirements of 40 CFR 60.13, Appendix B, and Appendix F for certifying, maintaining, operating and assuring quality of the systems, and with the requirements of 40 CFR Part 75.

## **Recordkeeping**

1. The owner or operator of the emission source shall maintain records of the occurrence and duration of any start-up, shut-down, or malfunction in the operation of Holcomb2; any malfunction of any air pollution control equipment; or any periods during which a continuous monitoring system or monitoring device is inoperative. These requirements are described in 40 CFR 60.7(b).
2. The owner or operator of the emission source shall maintain records of the occurrence and duration of any emergency condition in the operation of the Holcomb2 scrubber. These requirements are described in 40 CFR 60.7(b).
3. The owner or operator of the emission source shall maintain records of the occurrence and duration of any periods during which a continuous monitoring system or monitoring device is inoperative. These requirements are described in 40 CFR Part 75.
4. The owner or operator of the emission source shall maintain records of the reports, notifications, and performance tests required by this permit.

All of the above records shall be maintained on site for a period of 5 years.

## **Reporting**

Reports demonstrating compliance shall be submitted to the KDHE in the same units as stated in the applicable requirements.

2. Items that are required to be reported quarterly (opacity excess emission reports per 40 CFR 60.49a(h)) shall be submitted to KDHE and postmarked by the 30th day following the end of each calendar quarter.
3. Items that are required to be reported semiannually (NO<sub>x</sub> and SO<sub>2</sub> per 40 CFR 60.49a) shall be submitted to KDHE and postmarked by the 30th day following the end of each calendar half.
4. Items that are required to be reported annually (natural gas consumption of the auxiliary boiler) shall be submitted to KDHE and postmarked by the 30th day following the end of each calendar year.
5. Within 90 days after the 18 months NO<sub>x</sub> trial period, if the data demonstrates that the 0.08 lb/MMBtu limit cannot be met, then the owner or operator shall submit a performance assessment report and, as part of this report, the minimum NO<sub>x</sub> emission rate, in lb/MMBtu, that Holcomb2 can achieve during long-term load dispatch operation, and justification thereof. In that event, “best practices” shall continue to be used until an alternative emission rate is effective.
6. The Holcomb2 unit’s excess emissions and monitoring systems performance report and/or a summary report for opacity per 40 CFR 60.49a(h) shall be submitted to the KDHE as required by 40 CFR 60.7(c). The summary report form shall contain the information and be in the format as specified in 40 CFR 60.7(d). Written reports of excess emissions shall include the following information:
  - a. The magnitude of excess emissions computed in accordance with 40 CFR 60.13(h), any conversion factor(s) used, the date and time of commencement and completion of each time period of excess emissions, and the process operating time during the reporting period.
  - b. Specific identification of each period of excess emissions that occurs during start-ups, shut-downs, and malfunctions, the nature and cause of any malfunction (if known), the corrective action taken or preventative measures adopted. The date and time identifying each period during which the continuous monitoring system was inoperative except for zero span checks and the nature of the system repairs and adjustments.
  - c. When no excess emissions have occurred or the continuous monitoring system(s) have not been inoperative, repaired, or adjusted, such information shall be stated in the report.

## **Notification**

1. The Bureau of Air and Radiation shall be notified when installation of the equipment is complete so an evaluation may be conducted to verify compliance with applicable regulations.
2. K.A.R. 28-19-720 (40 CFR 60.7(a)) requires that written notifications of the following be submitted to KDHE:
  - a. The date construction of Holcomb2, associated fuel and ash handling equipment, and the associated air pollution control systems is commenced. The notification is to be postmarked no less than 30 days after such date.
  - b. The actual date of initial startup of Holcomb2. The notification is to be postmarked within 15 days after such date.
  - c. The date when the initial performance testing is to commence. The notification is to be postmarked no less than 30 days prior to such date.

Please use the enclosed NSPS notification form to submit the above required notifications.

## **Acid Rain Requirements**

Holcomb2 is subject to certain Acid Rain Requirements. A complete Acid Rain permit application shall be submitted in accordance with the deadlines specified in 40 CFR Part 72. Notification regarding applicable monitoring equipment will be made as required.

## **General Provisions**

1. This document shall become void if construction, installation or modification of Holcomb2 has not commenced within 18 months of the amended effective date of this permit, or if the construction, installation or modification of Holcomb2 is interrupted for a period of 18 months or longer.
2. A construction permit or approval must be issued by KDHE prior to commencing any construction or modification of equipment or processes which result in an increase in potential-to-emit equal to or greater than the thresholds specified at K.A.R. 28-19-300.
3. Upon presentation of credentials and other documents as may be required by law, the operator shall allow a representative of the KDHE (including authorized contractors of the KDHE) to:

- a. enter upon the operator s premises where a regulated facility or activity is located or conducted or where records must be kept under conditions of this document;
  - b. have access to and copy, at reasonable times, any records that must be kept under conditions of this document;
  - c. inspect at reasonable times, any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this document; and
  - d. sample or monitor, at reasonable times, for the purposes of assuring compliance with this document or as otherwise authorized by the Secretary of the KDHE, any substances or parameters at any location.
4. The emission units or stationary sources that are the subject of this document shall be operated in compliance with all applicable requirements of the Kansas Air Quality Act and the Federal Clean Air Act.
  5. This document does not relieve the operator of the obligation to obtain other approvals, permits, licenses or documents of sanction that may be required by other federal, state or local government agencies.
  6. Issuance of this document does not relieve the owner or operator of any requirement to obtain an air quality operating permit under any applicable provision of K.A.R. 28-19-500.

**Permit Engineer**

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Rick Bolfig, P.E.  
Environmental Engineer  
Air Construction/Operating Permits & Compliance Section

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Date Signed

RJB:saw  
c: SCDO (for SWDO)  
C-5800