

US EPA ARCHIVE DOCUMENT

March 31, 2006

Mr. Daniel Brown
Manager, Air Permits, Toxics, and Indoor Programs Unit
EPA New England
1 Congress Street, Suite 1100
Boston MA 02114

**Subject: Fore River Development, LLC
MA PSD Permit MBR-99-COM-018
Request for Modifications**

Dear Mr. Brown:

Fore River Development, LLC (Fore River) is providing this letter to request modifications to the Prevention of Significant Deterioration (PSD) Permit for our 775 MW combustion turbine combined cycle electric generating facility in Weymouth, MA. The PSD permit was originally issued as a combined PSD and State Conditional Plan Approval by the Massachusetts Department of Environmental Protection (MassDEP) on May 5, 2000 (PSD/CPA). One minor revision to the PSD/CPA (updating certain parameters for the emergency diesel generator) was issued by MassDEP on October 17, 2001.

As you are aware, the MassDEP returned delegation of the PSD program to the U.S. Environmental Protection Agency (USEPA) effective March 3, 2003. Therefore, Fore River has separately applied to and received from MassDEP revisions to the Conditional Plan Approval, which include provisions relating to the Fore River facility's operations on oil. A copy of the Final Air Plan Approval issued by MassDEP on March 20, 2006 is included with this letter as Attachment A. By this letter, Fore River is separately requesting from the USEPA an updated PSD permit.

None of the modifications being requested to our PSD permit result in any increase to the currently approved short-term or long-term emission limits for the facility. Therefore, these modifications themselves do not constitute PSD "major modifications."

In Attachment B, we have provided a copy what we propose to be our separate "PSD" permit. Attachment B also includes a separate explanation document on how this proposed PSD Permit is different than the original PSD/CPA (as modified on October 17, 2001) as well as the MassDEP Final Plan Approval issued on March 20, 2006. A summary of the key conditions in our PSD permit for which updates are requested, based on provisions incorporated by MassDEP into our Final Plan Approval, are as follows:

- Alternate fuel oil provisions based on use of lower sulfur transportation grade distillate fuel oil (e.g., ultra low sulfur diesel).
- Changes to auxiliary boiler fuel use provisions.

- Revision to minimum normal operating load.
- Incorporation of startup/shutdown emission limits.

Discussion of each of these requested modifications is provided below, following a facility description.

Facility Description

Fore River Development, LLC (the Permittee) operates a new dual fuel combined-cycle electric generating facility in Weymouth, Massachusetts. The Project is referred to as the Fore River Station Project. The Project is configured as a new main power block generating nominal 775 MW of electric power.

Fore River Station (Units 11 and 12) includes two Mitsubishi Heavy Industries Model 501G combustion turbine generators (CTGs) each including a Heat Recovery Steam Generator (HRSG). The new power block is equipped with one steam turbine generator (STG). Each CTG has a nominal generating capacity of approximately 250 MW. The hot exhaust gases from each CTG pass through a HRSG, which uses the heat from these gases to produce steam. These exhaust gases also contain sufficient oxygen to allow the placement of supplemental firing burners in the ducts just upstream of the HRSG equipment. Each HRSG houses an oxidation catalyst for carbon monoxide (CO) control, followed by an ammonia (NH₃) injection grid and selective catalytic reduction (SCR) catalyst for control of nitrogen oxides (NO_x). The steam produced by each HRSG is fed into a single condensing STG. The STG has a nominal generating capacity of approximately 275 MW. An air-cooled condenser is used to condense the steam.

Other auxiliary equipment includes an aqueous ammonia storage tank, a continuous emissions monitoring system (CEMS), a new auxiliary boiler and a new emergency diesel generator. The new auxiliary boiler is designated as Fore River Unit AB and provides steam for plant startup when both CTGs are off line. The auxiliary boiler has a maximum energy input of 83 MMBtu/hr HHV. The new emergency generator, 1,500 kilowatts (kW) or 15.4 MMBtu/hr, HHV, is designated as Fore River Unit EDG1 and is required for facility backup power to support shut down operations if no power is available from the utility grid.

Alternate Fuel Oil Provisions

The original PSD/CPA restricted fuel oil use in the two CTGs to no more than 29,074,350 gallons of transportation grade distillate fuel oil (maximum of 0.05% sulfur content) per rolling 12-months (Condition III.E. of the PSD/CPA). This quantity of fuel was calculated based on 720 hours of oil firing at 100% load at -12°F. Oil use was further restricted during the period of May 1 through September 30 to only emergency situations (with a variance from MassDEP), natural gas unavailability, commissioning and periodic readiness testing. Currently, oil firing has not yet been commissioned in the CTGs. In conjunction with our plans to commission fuel oil operation for availability late this year¹, we have proposed alternate fuel oil provisions that should significantly reduce SO₂ and other emissions, and also provide greater operating flexibility.

¹ In their recent Regional System Plan 2005, ISO New England has identified an urgent and growing need for increased dual fuel generation for electric system reliability. This plant has been identified by ISO New England as one which is required for regional system reliability (Regional System Plan 2005 (RSP05) dated October 29, 2005 by ISO New England, Executive Summary, page 13, "Findings"). The facility's ability to operate more flexibly on oil will therefore address a key regional power issue.

Under the alternate fuel oil provisions, the Fore River facility could fire lower sulfur distillate fuel oil (e.g., ultra low sulfur diesel) rather than the currently approved 0.05% sulfur distillate fuel. SO₂ emissions would be reduced substantially from what they would be with 0.05% sulfur distillate fuel.

The other key aspect of the alternate fuel oil provisions is that oil operations would be based on actual measured emissions compared to calculated oil firing emission allotments, rather than the current limit of 29,074,350 gallons of 0.05% sulfur distillate fuel. The original PSD/CPA (and current MassDEP Final Plan Approval) have overall limits for tons per year (tpy) of NO_x, SO₂, PM, CO, VOC, and NH₃. These tpy limits are based on gas and oil firing allotments as calculated during the application process. The oil firing tpy allotments are based on the use of 29,074,350 gallons of 0.05% sulfur distillate fuel. Fore River is proposing to use these oil firing tpy allotments as documented during the application process, to calculate proposed rolling 12-month oil fired limits. At the end of each month, the actual rolling 12-month oil emissions will be compiled and compared to the rolling 12-month oil emission limits. The most restrictive pollutant will limit the total amount of lower sulfur distillate fuel oil that can be fired. The tpy of emissions for each individual pollutant on oil will be less than or equal to the quantity of emissions that would have been allowed with 29,074,350 gallons of 0.05% sulfur distillate fuel. Fore River's ability to achieve additional operating flexibility will depend on lower actual oil firing emissions rates compared to the short-term oil limits.

These proposed alternate fuel oil provisions will provide a significant benefit in terms of reduced amounts of SO₂ emissions during oil firing. The emissions of all other pollutants will be no greater than those already allowed under the original PSD/CPA. Therefore, we do not believe that these alternate fuel oil provisions have any New Source Review implications or represent a substantive alteration of our current Permit.

We are not requesting any modifications to the current time of year oil firing restrictions. We will continue to be subject to the provision that only allows oil firing between May 1 and September 30 for initial commissioning/testing, readiness testing, natural gas unavailability, or an emergency variance. No such restrictions are applicable from October 1 – April 30.

The MassDEP has endorsed these alternate fuel oil provisions, and has incorporated them into our Final Plan Approval. These MassDEP provisions are found in Attachment A. We are requesting similar provisions be included in the separate PSD Permit, as shown in Attachment B.

Auxiliary Boiler Fuel Use Provisions

The original PSD/CPA restricted fuel use in our auxiliary boiler to no more than 48,000 MMBtu of fuel (which operation could be either natural gas or 0.05% sulfur transportation diesel fuel oil) per rolling 12-month period (Condition III.H. of the PSD/CPA). Our auxiliary boiler is used primarily during startup of the facility when both turbines are off-line. The current limitation of 48,000 MMBtu was developed when it was expected the facility would be primarily a baseload plant and startups would be relatively infrequent. Due to the current market conditions, it is anticipated that the plant will cycle more frequently, at least for the relatively near term. Therefore, greater use of the auxiliary boiler than had been previously anticipated will be necessary. Based on our anticipated cycling schedule, we are requesting that the rolling 12-month fuel quantity for the auxiliary boiler be increased to a total of 132,000 MMBtu. We are requesting that the oil portion of the rolling 12-month fuel quantity be limited to 24,000 MMBtu.

These changes will not affect the annual facility-wide emissions or emission limits. That annual facility-wide limits assume 8760 hours per year of turbine operation, which is still our controlling case. As stated in our original PSD/CPA (footnote 6 to Tables 1 & 2 in Section III.A.), the facility emissions are equal to total combustion turbine emissions without a specific increment included for the auxiliary boiler or emergency generator. If the auxiliary boiler operates, it means both turbines have been offline with a period of no emissions. Our accounting of annual emissions includes turbine operation, startups, and auxiliary boiler/emergency generator operation. Facility cycling is “self-correcting” for annual emissions, in that the net effect of shutdown, downtime, startup, and auxiliary boiler operation results in fewer emissions (on average) than straight baseload operation of the plant.

The potential emissions for the auxiliary boiler itself will change a small amount due to these proposed changes. Attachment C presents the comparison of current and proposed auxiliary boiler potential emissions. NO_x potential emissions from the auxiliary boiler will only increase by 0.7 tons per year (tpy). CO potential emissions will increase by 3.4 tpy. SO₂ and PM potential emissions will actually decrease (by 0.5 and 0.6 tpy respectively) due to the drop in potential auxiliary boiler oil use.

The MassDEP has endorsed these changes, and these Final Plan Approval conditions are also found in Attachment A. We are requesting similar provisions be included in the separate PSD Permit, as shown in Attachment B.

Minimum Turbine Operating Load Condition

The original PSD/CPA included a restriction that the turbines not operate at less than 75% power, excluding startups, shutdowns, and fuel transfers (Condition X.2. of the PSD/CPA). This restriction was based on the manufacturers’ minimum load guarantees for emissions performance of the system.

Actual operation of the Fore River facility on natural gas has demonstrated that emissions compliance can be maintained at lower operating load levels. Reduced load emission testing was conducted on August 13, 2003. The reduced load testing was done in accordance with a Protocol that was approved by the MassDEP. This testing demonstrated that the Fore River turbines could operate in compliance with the approved emission rates down to 55% turbine load. Dispersion modeling was also conducted which demonstrated that the exhaust conditions at 55% load were consistent with ambient air quality compliance. The MassDEP approved a Plan Approval modification (October 7, 2003) revising the minimum operating load from 75% to 55%. This restriction is also included in Attachment A. We are requesting similar provisions be included in the separate PSD Permit, as shown in Attachment B.

The ability to operate down to 55% load rather than 75% load provides ISO New England with more flexibility in how the Fore River units are dispatched. This means these low emitting units can operate more frequently, and displace higher emitting older units more often, than they otherwise would.

Startup/Shutdown Emission Limits and Duration

The original PSD/CPA required Fore River to conduct initial compliance tests for startup and shutdown conditions in order to allow the MassDEP to approve maximum allowable emission rate limits for these

conditions (Condition X.12. of the PSD/CPA). This testing was conducted, and facility CEMS data has also been reviewed in order to develop recommended startup/shutdown limits. The data which served as the basis for the proposed startup/shutdown limits was reviewed by MassDEP. The startup/shutdown limits that MassDEP has incorporated into the Final Plan Approval are found in Table 4 (page 14 of 72) of Attachment A. We are requesting similar provisions be included in the separate PSD Permit, as shown in Attachment B.

The original PSD/CPA also included a condition which restricted turbine operation below 75% power (now 55% power as discussed above) to no more than 3 hours duration for each startup, shutdown and fuel transfer or for a duration that may otherwise be practical to achieve startup from a cold, warm, or hot turbine condition. (Condition X.2. of the PSD/CPA) Based on actual operating experience with the facility, this condition has been modified in the MassDEP Final Plan Approval to allow this duration to be no more than 5.0 hours for startups, 3.0 hours for fuel transfers, and 2.0 hours for shutdowns, or for a duration that may otherwise be practical to achieve startup from a cold, warm, or hot turbine condition. We are requesting similar provisions be included in the separate PSD Permit, as shown in Attachment B. These changes will not alter the actual startup/shutdown durations that the facility experiences. These changes are just a more accurate description of the actual startup/shutdown durations for the plant. Also, as noted above, facility cycling is "self-correcting" for annual emissions, in that the net effect of shutdown, downtime, startup, and auxiliary boiler operation results in fewer emissions (on average) than straight baseload operation of the plant (on which the potential/permitted emissions are based).

We are available to meet with you at your convenience to discuss any issues related to these requested modifications, and other items related to issuance of a separate PSD Permit for the Fore River facility. I may be reached at 617-381-2420.

Very truly yours,

George G. Wilson
General Manager
Fore River Station

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