Progress Energy

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September 28, 2009

Mr. Jeffrey F. Koerner, Administrator
New Source Review Section
Air Quality Division
Florida Department of Environmental Protection
2600 Blair Stone Road,
MS 5000
Tallahassee, Florida 32399-2400

Re: **Additional Response to Request for Additional Information**
Progress Energy Florida, Crystal River Power Plant
Project No. 01700004-022-AC (PSD-FL-383B)

Dear Mr. Koerner:

This letter presents additional information in response to questions raised in your January 28, 2009 request for additional information regarding Progress Energy Florida's request for changes in the allowed operation of the acid mist mitigation (alkali injection system). In addition to this request, Progress Energy would like to discuss similar issues related to the operation of the selective catalytic reaction (SCR) system.

Specifically in response to questions from the January 28 letter, Progress Energy presents the following answers.

Alkali Injection System

(9) Please provide supporting information from the equipment vendor regarding: the proposed maintenance schedule; the amount of time needed for shakedown to conduct the maintenance; the shared or common equipment; the cost of the shared or common equipment; the cost to install redundant shared or common equipment; and a detailed description of the operational control of the alkali injection system.

Response: The alkali injection system, also referred to as the acid mist mitigation or AMM system, equipment has been designed to allow for proper preventative maintenance to provide long term reliability. The system manufacturer (Wahlco) recommends scheduled annual maintenance periods to perform inspections, service and maintenance of the equipment.

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Progress Energy has worked with Wahlco and our contractor to determine maintenance practices intended to minimize emissions related to system maintenance or downtime. These efforts are subject to several general constraints:

- Unit scheduled outages occur approximately every 18 months;
- Only one unit is typically scheduled for an outage at a time in order to maintain electrical system reliability; and
- Some of the AMM system equipment is common to both units. Thus, when scheduled maintenance is performed on one unit during a scheduled outage, the operating unit SAM emissions will be affected, because the AMM system common equipment would be out of service.

In general, the design philosophy for the ammonia supply systems associated with the AMM system and the common systems that support the operation of the AMM system was to provide a system with redundant back up for most key components in order to provide reliability in most cases of potential failure. Progress Energy has worked with our contractor to determine what additional equipment, piping, foundations, controls and other modifications would be required to make the systems fully redundant, i.e. able to supply ammonia to at least one unit while any given subsystem was out of service for maintenance. In order to meet this criterion, it was determined that the following additional pieces of equipment would be required:

- Urea Auxiliary Steam Supply Line;
- Condensate Return Line to Plant;
- Urea Steam Saturator;
- Urea Condensate Recovery Tank;
- AMM Urea Solution Day Tank;
- AMM Hydrolyzer Blowdown Tank; and
- Manual valves at each of the above equipment to change flow from one item to the redundant equipment

Progress Energy has reviewed the maintenance recommendations from Wahlco and has compiled the following list of activities and durations for preventative maintenance.

- Urea Auxiliary Steam Supply Line – periodic (annual) testing and maintenance of isolation valve and pressure relief valves (24 hours)
- Condensate Return Line to Plant – annual maintenance of isolation valves (24 hours)
- Urea Steam Saturator – annual inspection and cleaning of spray nozzles (24 hours plus 8 hours cool down and 8 hour reheat)
- Urea Condensate Recovery Tank – annual inspection and cleaning of spray nozzles (24 hours plus 8 hours cool down and 8 hour reheat)
- AMM Urea Solution Day Tank – annual tank inspection (24 hours plus 12 hours for preparing the tank for entry and refill).
- AMM Hydrolyzer Blowdown Tank – annual tank inspection (24 hours plus 12 hours for preparing the tank for entry and refill)

These activities represent a total of 192 hours or 8 days of annual planned maintenance during which time one unit would operate without benefit of controls. Note that this total is somewhat less than the 240 hours or 10 days listed in our previous correspondence. That total included an allowance for "anticipatable" but not planned maintenance such as steam line or valve leaks associated with these common systems or with common areas of piping. In the case of some minor leaks posing no hazard to safety or environment and only minor operational impact, Progress Energy personnel would typically contain the leak and schedule the maintenance at a time when operational schedules would allow the maintenance activity to be performed with minimum operational and emissions impact. In this example, such an activity would be performed when one unit, but not both was out of service. Some of these activities might be accomplished at times when the ammonia injection system is out of service for the routine planned maintenance listed above. In our initial request for a total maintenance allowance of 10 days per year Progress Energy approached these items as an addition to scheduled maintenance in judging the total required maintenance time.

Progress Energy continues to request recognition that a total of up to 10 days of single unit operation (a total of 10 days operation for either unit, but only one unit at a time) with the alkali injection system out of service is necessary to the normal and reliable operation of the alkali injection system and that this be allowed under the permit. In the alternative, the agency could authorize 8 days of this time representing actually scheduled preventative maintenance and recognizing that the other circumstances and activities discussed may need to be treated as response to system malfunctions.

In response to your request, Progress Energy requested and our contractor provided a cost to design, supply, install, and commission the additional equipment, taking into account that this additional equipment would tie into an existing system. The estimated contractor's cost for the additional equipment is $4,060,000. In addition, Progress Energy would provide oversight, administration, plant coordination, and other services for an estimated cost of $609,000 (15% of the contractor fee). The total cost to install this additional equipment is $4,669,000. A copy of the contractor estimate is attached.

The final details of the operational control of the alkali injection system will be developed after the performance testing required by Section III Condition 16. In general, the rate of ammonia injection to the flue gas exhaust stream is regulated by a control valve at the ammonia flow control unit (AFCU). The ammonia is mixed with an air stream which in turn serves as a carrier to bring the ammonia to the flue gas and allow it to mix properly with the flue gas stream. The setting of the control valve and thus the rate of ammonia flow will be controlled in proportion to the expected mass flow rate of SO_3 in the flue gas exhaust stream. The SO_3 mass flow is expected to be directly proportional to the mass of sulfur contained in the coal combusted. The exact proportionality of the ammonia to the sulfur and the potential importance of other factors will be determined in the performance testing. Once that testing is complete, an algorithm will be developed and programmed into the plant control system regulating the ammonia flow based on the mass of sulfur combusted and other factors determined during the performance testing.

(10) The department understands that scheduled maintenance on the alkali injection system will be performed when at least one unit (unit 4 or 5) is shutdown. However, during this period, the alkali system must also be shutdown since the systems share critical common equipment. Please estimate the sulfuric acid mist (SAM) emissions rate during this shutdown for maintenance (one unit in operation without control by alkali injection). Please describe the measures that will be taken to minimize excess emissions during these periods.

Response: As presented in Table B-1 of the application, the calculated emissions rate for SAM is 0.009 lb/mmBtu. This is also the limit expressed in the permit. Based on the maximum hourly heat input rate of 7,200 MMBtu/hr, this represents a maximum emission of 64.8 lb/hr with the system in operation. Progress Energy calculates that the maximum emission with the ammonia injection off line will be 504 lb/hr (for one unit in operation). Based on the understanding that the ammonia system would be off line for a maximum of 10 days per year during which time one unit would be off line, this represents a maximum increase in emissions (potential to emit) of 52.7 tons per year from the unit that is operating. The calculations are shown in the table below.

Operation	Units	AMM System On	AMM System Off
Maximum Coal Sulfur Content	%	3.13	3.13
Coal Heat Content	Btu/lb	11375	11375
Uncontrolled SO2 Emissions	lb/mmBtu	5.5	5.5
Combustion Factor		0.011	0.011
SAM from Combustion	lb/mmBtu	0.093	0.093
SCR factor		0.005	0.005
SAM produced by SCR	lb/mmBtu	0.042	0.042
SAM leaving SCR	lb/mmBtu	0.135	0.135
Air Heater Factor		0.9	0.9
SAM leaving Air Heater	lb/mmBtu	0.121	0.121
ESP w/ AMM system		0.1	0.77
SAM leaving ESP	lb/mmBtu	0.012	0.093
FGD System Factor		0.75	0.75
SAM Leaving FGD	lb/mmBtu	0.009	0.070
Heat Input	mmbtu/hr	7200	7200
SAM Emission Rate (lb/hr)	lb/hr	64.8	504
Potential Emissions for 10 days per year	Tons	7.8	60.5
Change in Emissions (annual PTE)	Tons		52.7

The emissions presented here are maximum potential to emit. Progress Energy will make efforts to minimize these emissions. As discussed above, the primary step toward emissions minimization will be to schedule preventative maintenance activities during periods when one unit is out of service. Where possible, Progress Energy will schedule these activities for periods when the operating unit is scheduled for reduced load (and thus lower emissions).

SCR

The ammonia supply system to the SCR is essentially of the same design as that which supplies the alkali injection system. The SCR and AMM systems rely on the same common systems that support operation of both systems. As a result, the same maintenance issues discussed previously with regard to the alkali injection system apply to the SCR ammonia supply. Although the permit contains a recently added provision that the SCR shall operate "continuously", the treatment of NO_x (controlled by the SCR) under the permit is different from the treatment of sulfuric acid mist (controlled by the alkali injection system). NO_x is subject to an annual cap (2,085 tons per year per unit) and is monitored continuously. These values have been determined with appropriate allowance for start up, shut down, and malfunction. Progress Energy has determined that this allowance is sufficient to allow for all identified maintenance requirements while maintaining compliance with the limit.

Progress will continue to operate and maintain the units in a manner to reasonably minimize emissions during periods of upset, maintenance, start up, and shut down. Progress will also operate the SCR "continuously" during all periods of normal operating conditions. Progress requests that the agency acknowledge that periods of unit operation with the SCR out of service may occur (as in the maintenance examples given above) as long as the emissions remain in compliance with the limits stated in the permit; and that "operate continuously" as presented in the permit is intended only to be in contrast to previous revisions of the permit in which Progress was explicitly allowed to manage SCR operation to minimize CAIR compliance costs.

Progress Energy looks forward to working with you regarding this matter. For additional information or to discuss any issues regarding this application, please contact Mr. David Meyer in our St. Petersburg office by telephone at (727) 820-5295 or via email at dave.meyer@pgnmail.com.

Sincerely,

Larry E. Hatcher

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Plant file: 12510-D

CERTIFIED MAIL ARTICLE NO.: 7009 0080 0001 6934 3815