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Pennsylvania Electric Co.

Pennsylvania Electric Company

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August 7, 1995

AUG 10 1995

Regulatory Reinvention Pilot Projects
FRL-5197-9
Water Docket
Mail Code 4101
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

RE: Homer City Station: Alternate Emissions XL Demonstration Project

New York State Electric & Gas Corporation and Pennsylvania Electric Company, the Owners of the Homer City steam electric generating station in Indiana County, Pennsylvania, are pleased to submit a proposal to conduct a facility-based XL demonstration project at the Homer City Station. Implementation of the proposed project would provide the opportunity to demonstrate the environmental and economic benefits of authorizing alternative methods of complying with Clean Air Act emission standards and limitations. As set forth in the attached proposal, the Owners of the Homer City Station would document through the XL Project Program that implementation of the proposed project would result in annual cost savings of $18 million, increased administrative efficiency, and significant reductions in air emissions, solid waste generation, and contaminated run-off. We look forward to discussing the specifics of the project with you in more detail.

Very truly yours,

R. P. Lantzy by L. H. Roberts

R. P. Lantzy
Generation Technical Services Director

RPL:pkb
Attachment
cc: (See Attached List)

2 pp + 5 ATT (44 pp)

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# HOMER CITY STATION
# ALTERNATE EMISSIONS XL DEMONSTRATION PROJECT

ATT (A)

Homer City Station is a 1,890 megawatt (MW) net coal-fired electric generating station located in Center Township, Indiana County, Pennsylvania. Units 1 and 2 (620 MW net each) began operations in 1969 and Unit 3 (650 MW net) began operation in 1977. Pennsylvania Electric Company (Penelec) and New York State Electric & Gas Corporation (NYSEG) each own 50 percent of the station, and Penelec operates the station.

## 1. ENVIRONMENTAL RESULTS

The Homer City Station Alternate Emissions XL Demonstration Project would utilize an innovative regulatory approach to demonstrate the environmental and economic benefits of emissions trading between "existing" (Units 1 and 2) and "new" (Unit 3) $SO_2$ sources at the Homer City Station. Specifically, approval of the proposed project would demonstrate that station $SO_2$ emissions would be lower than if the units met their individually applicable emission limitations. Approval also would demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) for $SO_2$ and the $SO_2$ allowance requirements established in accordance with Title IV of the Clean Air Act Amendments of 1990. All this would be consistent with EPA's recent policies supporting market-based innovative environmental compliance programs. Once $SO_2$ trading between the units is established, the fuel source for Homer City Unit 3 would shift from a more remote and expensive low sulfur coal to a less costly local higher sulfur coal that would be cleaned on-site by an innovative technology coal cleaning facility. Major multi-media environmental and economic benefits, as discussed below, would result from having a single fuel supply for all three units rather than the two separate supplies currently required for the "existing" and "new" sources. For example, normalized annual reductions in air emissions are anticipated to be at least 34,595 tons of $SO_2$, 1,340 tons of $NO_x$, 278 tons of $PM_{10}$, 109 tons of VOCs, 94 tons of particulate, and 303 tons of fugitive emissions. In summary, the Homer City Station XL Demonstration Project would result in significant reductions in air emissions, solid waste generation and contaminated runoff at a cost savings of $18 million annually.

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**a. Background**

Penelec operates four major coal-fired electric generating stations in the Chestnut/Laurel Ridge Region of southwestern Pennsylvania. Conemaugh Station (1,986 MW gross), Keystone Station (1,983 MW gross), Homer City Station (1,944 MW gross) and Seward Station (214 MW gross) are all located within a distance of 25 miles of one another. The air quality impacts of these facilities can overlap leading to regulatory concerns regarding attainment and maintenance of NAAQS for $SO_2$ in the region.

In 1993 the Chestnut/Laurel Ridge Power Plant Owners formed a committee to develop a compliance strategy for the allowable $SO_2$ emission rate for each facility that affects the ambient $SO_2$ concentrations in the region to comply with the approved full dispersion modeling analysis of the region. The protocol that delineates the maintenance strategy of the Chestnut/Laurel Ridge Region has been submitted to the Pennsylvania Department of Environmental Protection (PaDEP) for approval. The plan would limit $SO_2$ emissions from each facility as follows:

| Facilities | Pennsylvania Present SIP Limits lbs $SO_2$/MBtu | Chestnut/Laurel Ridge Maintenance Plan lbs $SO_2$/MBtu |
|---|---|---|
| Conemaugh Station | 4.0[1] (unscrubbed) | 0.20 (scrubbed) |
| Keystone Station | 4.0[1] | 3.50 |
| Homer City Units 1&2 | 4.0[1] | 3.10 |
| Homer City Unit 3 | 1.2 | 1.2 |
| Seward Station | 4.0[1] | 1.48 |

[1]Maximum $SO_2$ limit with a 30-day average limit of 3.7 lbs. $SO_2$/MBtu.

With the advent of the 1990 Acid Rain Amendments, a major new regulatory program under Title IV was established for the control of $SO_2$ emissions. The centerpiece of the Title IV program is a market-based program encompassing emissions allowance and trading provisions for $SO_2$ control. Sources are allocated $SO_2$ allowances under a formula prescribed in the statute. An allowance is an authorization to emit one ton of $SO_2$ during or after a specific year. A source's annual $SO_2$ emissions are not allowed to exceed the number of allowances the source holds for use at the time of surrender. The allowances can be received from EPA or purchased and/or transferred from other affected sources.

Even with the enactment of the 1990 Clean Air Act Amendments, emission trading at a facility having a combination of "existing sources" and "new sources" cannot be used for complying with the original 1970 "command and control limits", the NSPS and/or SIP limit for each individual emission source. Early attempts by the Homer City Owners to obtain approval for this type of emission trading, known as "Bubbling", were unsuccessful due to EPA's position on the development of NSPS (see Exhibit 1). The establishment of a single $SO_2$ emission limitation for the units at Homer City Station with an Alternate Emissions XL Demonstration Project would prove the environmental and economic benefits (i.e., a market-based approach) of an alternative method to establish and implement SIP limitations and NSPS. Proposed limitations for the Homer City Station Units 1, 2 and 3 and resulting emissions under the XL Demonstration Project would be:

| Homer City Station | Chestnut/Laurel Ridge Strategy Emission Rate lbs. $SO_2$/MBtu | Demonstration Project Emission Rate lbs. $SO_2$/MBtu | Annual $SO_2$ Emissions (Tons) at 100% Capacity Factor: Chestnut/Laurel Ridge Strategy | Annual $SO_2$ Emissions (Tons) at 100% Capacity Factor: Demonstration Project Normalized Annual |
|---|---|---|---|---|
| Unit 1 ("existing source") | 3.1 | 2.44 | 92,222 | 64,555 |
| Unit 2 ("existing source") | 3.1 | 2.44 | 92,222 | 64,555 |
| Unit 3 ("new source") | 1.2 | 2.44 | 38,158 | 69,002 |
| Station (total $SO_2$ tons) | | | 222,602 | 198,112 |

The Homer City Station XL Demonstration Project would operate with a 3-hour enforceable $SO_2$ limit of 2.44 lbs/MBtu. In order to convert the XL Demonstration Project $SO_2$ emission rate of 2.44 lbs/MBtu on a 3-hour basis to an annual basis, the project emission rate is multiplied by the annualization factor of 0.89 for an unscrubbed unit, 3-hour averaging period, and one exceedance per ten years. When the XL Demonstration Project proposed $SO_2$ emission data is normalized for inclusion into the national allowance data base, the annual averaging period emission rate would be 2.17 lbs. $SO_2$/MBtu. Therefore, the expected normalized annual $SO_2$ emissions produced from the XL Demonstration Project would be 198,112 tons. This is a reduction of 34,490 tons of $SO_2$ (15.5%) from the Chestnut/Laurel Ridge maintenance plan for the region. In short, on a normalized annual basis, the proposed emissions reductions from Units 1 and 2 would be sufficient to "offset" virtually all the emissions from Unit 3.

**b. Environmental Benefits**

The proposed Homer City Station Alternate Emissions XL Demonstration Project would demonstrate multi-media environmental benefits in three categories: On-Site, Off-Site and Resource Conservation.

**b1. On-Site Environmental Benefit**

- A 34,490 ton reduction in normalized annual $SO_2$ emissions from Units 1, 2 and 3.
- Reduction of on-site coal handling fugitive dust emissions and $PM_{10}$ emissions of 223 tons per year and 135 tons per year, respectively, by minimizing truck travel on paved and unpaved roads (see Exhibit 2).
- Reduction of on-site vehicular emissions from reduced truck idling time to unload coal because of improved inventory management with one coal supply versus two different coal supplies. The preliminary estimate of these reductions is 44 tons per year of $SO_2$, 810 tons per year of $NO_x$, 57 tons per year particulate, 57 tons per year of $PM_{10}$ particulate and 66 tons per year of VOC (see Exhibit 2).
- Possible zero coal storage fugitive emissions and PM-10 emissions by incorporating various management practices with a one-product stockpile.
- Reduction in particulate emissions for Unit 3 since increased $SO_2$ emissions would improve electrostatic precipitator performance.
- Reduction in $NO_x$ emissions from Unit 3 by using a higher volatility coal.
- Reduction in trace elements (air toxic) emissions by the coal cleaning process. The coal cleaning process can provide large reductions in the concentration of many trace elements that, if released into the atmosphere, are considered to be potentially toxic or environmentally harmful (see Exhibits 3 & 4).
- Reduction in contaminated liquid runoff from the coal storage area via the improved management practices available with a single coal storage pile.
- Reduction in environmental effects associated with ash disposal by virtue of the higher pH ash produced from the local coals.

**b2. Off-Site Environmental Benefit**

- Reduction of vehicular emissions by elimination of 5,150,000 truck miles per year, equating to a reduction of 1.3 truck miles per ton of coal delivered. This is because the sources of raw coal for the coal cleaning plant are closer to the station than the available Unit 3 compliance coal sources. The preliminary estimate of these reductions is 61 tons per year for $SO_2$, 530 tons per year for $NO_x$, 37 tons per year for particulate, 37 tons per year of $PM_{10}$ particulate and 43 tons per year of VOC (see Exhibit 2).
- A reduction in damage to the state infrastructure system with the elimination of 5,150,000 truck miles per year, thereby reducing emissions from equipment and material used for repairing and/or replacing the infrastructure system.
- Elimination of approximately 1,300 truck tires from solid waste disposal annually and avoidance of the environmental effects associated with their manufacture (see Exhibit 2).
- Elimination of off-site fugitive dust and $PM_{10}$ emissions of 80 tons per year and 49 tons per year, respectively, from blending facilities and associated truck traffic (see Exhibit 2).
- Elimination of various small widespread coal refuse disposal areas with the elimination of low sulfur coal production at off-site coal cleaning facilities.

**b3. Resource Conservation**

The Homer City Station single $SO_2$ emission limitation concept reduces the likelihood of needing a $SO_2$ scrubber to address escalating fuel costs for Unit 3 because under the terms of the Homer City XL Demonstration Project emission limits can be met without the use of a scrubber. As a result, the environment also would derive the following benefits:

- Elimination of truck miles to haul limestone and gypsum to and from the station.
- Elimination of limestone mining activities, preserving the limestone resource and elimination of the polluting activities associated with mining.

- Conservation of raw materials and avoidance of the environmental effects, including land-related construction impacts associated with fabricating and installing an $SO_2$ scrubber system.
- Conservation of the local water resources.
- Elimination of the need to discharge additional dissolved solids loading into the local streams.
- Avoidance of energy consumption associated with the operation of an $SO_2$ scrubber system and contaminants from the generation of additional electricity to replace the power necessary to operate the scrubber system.

## 2. COST SAVINGS AND PAPERWORK REDUCTION

The Homer City Station Alternate Emissions XL Demonstration Project would demonstrate and document how using market incentives would minimize the costs of meeting SIP limitations and NSPS and provide economic opportunity in the region. In contrast, the traditional approach of "command and control" would not take advantage of lower cost pollution reduction strategies, nor would it provide incentives for the facility to use its own expertise to advance pollution control techniques and technology. Finally, the project would investigate and document methods for expanding EPA's existing emissions trading policy and market incentive programs to include trading between "new" and "existing" sources.

The Homer City Station Alternate Emissions XL Demonstration Project would document the following savings, economic opportunities and reduction in paperwork:

- Reduce fuel costs by $18,000,000 per year; additional fuel cost savings should be achieved during Phase II of the Acid Rain Program.
- Maintain and possibly increase the number of local mining jobs in Pennsylvania.
- Expand the use of a coal cleaning facility to reduce sulfur in raw coal produced from the central Pennsylvania high sulfur region.
- Reduce and/or eliminate small and dispersed environmental polluting activities.
- Reduce the number of required reports with one emission standard and one coal supply.

## 3. STAKEHOLDER SUPPORT

On November 13, 1981, at 46 Fed. Reg. 55975, EPA granted an Innovative Technology Waiver, pursuant to Section 111 (j) of the 1977 Clean Air Act, to the Homer City Station (see 40 C.F.R. § 60.47). The deep cleaned coal portion of the Multi-Stream Coal Cleaning System (MCCS) was not producing coal to comply with the NSPS $SO_2$ limit on Unit 3; therefore, the facility required additional time to complete modifications to the MCCS to produce deep cleaned coal to meet the NSPS $SO_2$ limit. The waiver allowed $SO_2$ emissions from Unit 3 to exceed the NSPS $SO_2$ limit for a limited period of time and under specific conditions. All three units were combined together as one $SO_2$ emission source, requiring Units 1 and 2 to reduce their $SO_2$ emissions. The total annual $SO_2$ emissions under the Innovative Technology Waiver were reduced from 276,150 tons under the MCCS concept to 262,258 tons under the Innovative Technology Waiver, which was approximately a 5% reduction in $SO_2$ emissions.

EPA, PaDER (now PaDEP), the Pennsylvania legislative delegation, industry-wide organizations and local groups were supportive of the Homer City Owners' efforts during the Innovative Technology Waiver for the MCCS concept and continue to be supportive of recent environmental efforts at Homer City Station, such as: the Units 1&2 Low $NO_x$ Burners Demonstration Project. PaDEP was very supportive of recent environmental efforts by the Homer City Station and a compliance coal supplier to consolidate numerous off-site, delivery, crushing and blending operations of one million tons of low sulfur coal into one on-site delivery, crushing and blending yard. The Owners believe PaDEP, industry-wide organizations and local groups would be supportive of the Homer City Station Alternate Emissions XL Demonstration Project and will reconfirm their continued support during the EPA screening process for the XL Demonstration Project.

## 4. INNOVATION/MULTI-MEDIA POLLUTION PREVENTION

The Homer City Station Alternate Emissions XL Demonstration Project will demonstrate innovative emissions control of $SO_2$, help reach small and dispersed emissions sources that are difficult to control directly and secure more reliable, less polluting changes to the energy production process. The innovative strategy for the alternate emission project is the allowance of facility-wide trading between "existing" and

"new" sources. The project will provide actual operating experience to document the benefits of this approach.

The Homer City Station Owners agree with EPA that there should be a systematic approach to environmental protection. It has been our experience that while trying to reduce one pollutant emission from a source, other pollutants at the same source and/or pollutants in other environmental medium have a tendency to increase. Therefore, another aspect of the Alternate Emission XL Demonstration Project is to demonstrate and document how an innovative control strategy for $SO_2$ emissions can control other pollutants at the same source and/or prevent the generation of other pollutants in different environmental mediums. As explained above, under "Environmental Results", the multi-media pollution benefits of the Homer City XL Demonstration Project would be significant.

The proposed XL Demonstration Project also would further demonstrate the effectiveness of an innovative technology coal cleaning facility. In the spring of 1991, the coal cleaning plant was converted from a MCCS facility to a single-product facility due to changing washability characteristics of the raw coal which prevented the coal cleaning plant from producing adequate quantities of deep cleaned coal to meet the Unit 3 NSPS $SO_2$ limit. Additional modifications currently being made to the coal cleaning plant will allow the facility to produce coal to meet the proposed Alternate Emission XL Demonstration Project limit of 2.44 lbs. $SO_2$/MBtu on a 3-hour basis, resulting in normalized annual emissions approximately 16 percent below annual $SO_2$ emissions under the Chestnut/Laurel Ridge maintenance plan.

## 5. TRANSFERABILITY

Implementation of the Homer City XL Demonstration Project would provide the opportunity to audit, document and promptly report on the effectiveness and benefits, from an environmental and cost perspective, of allowing facilities to apply an emissions trading concept to achieve compliance with SIP limitations and NSPS. A successful Homer City XL Demonstration Project would provide the basis for authorizing the use of alternative NSPS or alternative methods of measuring NSPS compliance at all types of facilities subject to NSPS, whether those facilities are comprised of "existing" and "new" sources or only "new" sources. In addition, the environmental benefits associated with

reducing the number and types of coal used could be realized at any coal-fired plant that currently uses more than one type of coal to achieve compliance. Finally, the documentation provided by the Homer City XL Demonstration Project may establish a record to support an amendment to Section 111 of the Clean Air Act to clarify that facility compliance with NSPS may be accomplished in a number of ways, provided that overall facility emissions would be no greater than if compliance were measured at each individual unit.

## 6. FEASIBILITY

The technical and administrative feasibility of the Homer City Station Alternate Emissions XL Demonstration Project has been previously demonstrated at the Homer City Station by the Innovative Technology Waiver. Furthermore, the experience and modeling at the Homer City Station under the Innovative Technology Waiver has shown that trading of $SO_2$ emissions between "existing" and "new" sources does not affect regional NAAQS attainment and protects local mining jobs. The proposed Alternate Emissions XL Demonstration Project has been designed to demonstrate, quantify and document the environmental, economic and financial benefits derived from an expanded market-based emission trading program.

The Homer City Owners have successfully completed other demonstration projects during the past 25 years, including the Units 1&2 Low $NO_x$ Burners Demonstration and the MCCS Demonstration Project, in which EPA invested approximately six million dollars. The Homer City Owners have demonstrated the financial resources for the completion of these demonstration projects and have the resources necessary to complete the proposed project.

## 7. MONITORING, REPORTING AND EVALUATION

The Homer City Station Owners will work with EPA and the other stakeholders to develop clear objectives and requirements for the project that are measurable and to bring the Homer City Station Alternate Emissions XL Demonstration Project to a successful completion. With the experience of the Homer City Owners in various demonstration projects, many different methods have been developed for collecting, analyzing and transmitting information and performance data to the public, industry and

agencies, e.g., by utilizing CEMs systems in accordance with 40 C.F.R. Part 75 (Acid Rain Monitoring Requirements), coal sampling and analysis systems, as well as reports, papers, conferences, seminars, etc. The Owners would be willing to use these information forms or any other suggested method to deliver the project results to the public and/or to EPA and PaDEP. The information would include results on:

- Technical evaluation of the cleaning plant to utilize local coals to comply with the single facility-wide $SO_2$ emission limit.
- Administrative evaluation of how the single facility-wide $SO_2$ emission limit can be incorporated into the Title IV market-based program.
- Evaluation, quantification and documentation of the multi-media benefits produced from the project implementation.

## 8. SHIFTING OF RISK BURDEN

Consistent with Executive Order 12898, the Homer City Alternate Emissions XL Demonstration Project will not result in any disproportionate shift of adverse human health or environmental effects on to minority or low-income populations. The lowered cost of environmental compliance obtained through the project will result in lowered product cost and hence, increased production. Any resulting shift of environmental burden will result in a geographical shift toward the Homer City Facility. The Homer City Facility is located on a rural 2,400 acre tract in Indiana County, Pennsylvania with limited exposure to the local population. Indiana County does not have a substantial minority or low income segment in its population. The additional production shift toward the Homer City Facility will replace generation from other more costly facilities within the Owner's respective Power Pools resulting in a lessening of the environmental burden on their local populations. These are generally older, less efficient, facilities located more closely to metropolitan areas which boast a much larger minority or low income population segment than that of Indiana County, Pennsylvania.

In discussion of the impact of this project on the low income population, it is worthwhile to note that the end result of this project will be lower cost electricity available to the consumer, with a net decrease in the environmental impact. Electricity has become a basic human need, and as such, the cost of electricity has a substantial bearing on the

disposable income of the low income population. As the cost of compliance with environmental regulations increases, the subsequent increased cost of service has a detrimental effect on the quality of life for those in the lower income brackets. This proposed project, with its maintenance of environmental standards at substantially lower cost, will result in a net positive effect on the quality of life of those in the lower income brackets by resulting in a net increase in their disposable income.

## 9. LEGAL MECHANISMS FOR IMPLEMENTING THE HOMER CITY STATION XL DEMONSTRATION PROJECT

Three alternative legal strategies for implementing the proposed Homer City Station XL Demonstration Project are outlined below. The conditions of each approach would be similar, but the method of imposing them would differ. First, for the term of the project, a consent decree with EPA and PaDEP could be developed and used to implement to Homer City XL Demonstration Project. A condition of the consent decree would be that Units 1, 2 and 3 individually comply with an emissions limitation of 2.44 lbs. $SO_2$/MBtu. Resulting emissions for the station as a whole would be lower than if each unit individually complied with the currently applicable limitations. A failure to comply with the limitations of the consent decree would be grounds for enforcement action.

A second approach would be to establish an alternative methodology for determining Homer City Station's compliance with NSPS. This would be accomplished by authorizing, as part of the Final Project Agreement, a "compliance bubble" for the Homer City Station to measure adherence to NSPS. Station compliance with NSPS would be measured by establishing a bubble that would reduce emissions at the existing units to a point that total emissions from the station as a whole would be less than that which would occur if all units were in compliance with currently applicable limitations. Specifically, the Final Project Agreement would require that all three units individually comply with a 2.44 lbs. $SO_2$/MBtu emissions limitation. EPA previously took this type of approach when it authorized a bubble to determine the Central Illinois Public Service Company Newton Power Station's compliance with NSPS. See 40 C.F.R. §§ 60.43(e), 60.46(h), and Part 60, App. G.

As a third alternative, EPA could establish, as part of the Final Project Agreement, an alternative NSPS for the Homer City Station pursuant to 40 C.F.R. Part 60. This standard, which would be 2.44 lbs. $SO_2$/MBtu, would be applied to all three units individually for the term of the proposed Homer City XL Demonstration Project. EPA took a similar approach when it granted the Innovative Technology Waiver pursuant to Section 111(j) of the Clean Air Act to the Homer City Station in 1981. The terms and conditions of that Innovative Technology Waiver, which are set forth at 40 C.F.R. § 60.47, could provide a model for the terms and conditions for the Homer City XL Demonstration Project Final Agreement.

## 10. CONCLUSION

The approval of an XL Demonstration Project for the Homer City Station would demonstrate the environmental and economic benefits of applying a single emission limitation to existing and new units at the station. This approach is consistent with the 1990 amendments of the Clean Air Act, by further demonstrating the benefits of a market-based approach to air pollution control. Additionally, the Homer City XL Demonstration Project would provide the opportunity to document and quantify the multi-media effects of using the proposed approach at a coal-fired utility plant. Specifically, in addition to saving $18 million dollars annually, the proposed project would yield anticipated normalized annual reductions in air emissions of at least 34,595 tons of $SO_2$, 1,340 tons of $NO_x$, 303 tons of fugitive emissions, 278 tons of $PM_{10}$, 109 tons of VOCs and 94 tons of particulate. Finally, the project would result in lower trace elements emissions, the production of less acidic ash, reduced solid waste generation, less runoff from coal storage areas, and increased administrative efficiency. Stated simply, the proposed project represents the cleanest, cheapest, and smartest approach to generating electricity at the Homer City Station.