



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

November 18, 2002

Mr. George A. Monasky, P.E.
Pennsylvania Department of
Environmental Protection
South East Regional Office
Lee Park - Suite 6010
555 North Lane
Conshohocken, PA 19428

Dear Mr. Monasky:

I am responding to your letter dated April 22, 2002, in which you ask the U. S. Environmental Protection Agency's (EPA) opinion on whether the activity of Florida Power and Light Energy (FPL), in making the bypass stack functional on its 52 MW combustion turbine at its Marcus Hook facility, constitutes routine repair and maintenance. In addition, you asked if EPA considered the operation of this turbine to supply steam to Sunoco and electricity for sale to the electrical grid a change in the method of operation of the unit requiring the project to undergo a Prevention of Significant Deterioration (PSD) analysis.

In an FPL letter dated March 8, 2002, the company states that the "repairs" to the bypass stack, i.e., making the bypass stack and associated dampers operational, are exempt from PSD review because these activities are considered routine repair replacement or maintenance. As you may know, the determination of whether a proposed physical change is "routine" is a case-specific one and takes into consideration the nature, extent, purpose, frequency and cost of the project, as well as other relevant factors. Based on a review of the information available to us we have provided a detailed discussion that will assist you in determining whether or not the changes FPL proposes to the bypass stack constitute a "physical change" as that term is used in the relevant regulations which do not meet the routine maintenance, repair and replacement exemption under 40 C.F.R. § 52.21, as incorporated by reference at 25 Pa. Code §§ 127.81 - 83. For a non-routine change, you must determine if the proposed changes constitute a "major modification" that will result in a significant emissions increase. If so, the facility must obtain a PSD permit before it commences construction on the proposed project.

This letter is intended to provide guidance to you to consider in your role as the PSD permitting authority. Our guidance on this matter is provided in Enclosure A to this letter. We considered the following materials in developing this document: your April 22, 2002 letter to us; FPL Energy letter dated April 23, 2002, responding to questions contained in your letter dated March 22, 2002; FPL letter of March 8, 2002; and your June 12 and June 13, 2002 e-mail responses to our e-mail dated June 10, 2002. In addition, we considered your e-mail of August 30, 2002 where you provided operating data for the cogeneration unit.



Based on EPA's review of the available information, we believe the proposed project is a physical change and/or a change in the method of operation that does not fall within the routine repair and maintenance exemption in 40 CFR 52.21. This document discusses our analysis of the information provided by your office.

Our response attempts to provide guidance on this matter, however, it does not represent final Agency action. Instead, this guidance is intended to assist in the decision-making process that the state must go through in its role as the PSD permitting authority.

Please feel free to contact me at 215-814-2187 or Paul T. Wentworth of my staff at (215) 814-2183 if you have any questions regarding this letter.

Sincerely,

Makeba A. Morris, Chief
Permits & Technical Assessment Branch

Enclosure

Enclosure A

I. BACKGROUND:

A. Physical Description of the Relevant Equipment

The relevant equipment (the “Unit”) consists of a combustion turbine that is combined with a compressor on the same drive shaft . The combustion turbine is rated at 51.77 MW. Permit No. OP-23-0084 allows the unit to burn as fuel either pipeline quality natural gas or reformer gas. The heat input to the Unit is 639 MMBTU/hr. The compressor compresses air at atmospheric pressure, into which fuel is injected and combustion takes place. Steam is injected in with the combustion gasses and the gasses are directed to the turbine. The turbine output shaft drives a gearbox which in turn drives a generator which can be used to produce electricity. The exhaust and steam mixture then proceeds to a heat recovery steam generator (HRSG) which provides make-up steam to produce process quality steam used in a petroleum refinery. This mode of operation is defined herein as the electricity-steam mode.

In the original configuration, a second operational mode was available known herein as the electricity-only mode. In this mode, the turbine exhaust gasses were diverted by a damper system to a bypass stack located after the combustion turbine where they bypass both the HRSG and the main stack after the HRSG¹. This mode allowed the unit to produce electricity without steam, the bypass stack was opened, allowing the exhaust gasses to exit the turbine and bypass the HRSG, in turn allowing Unit to deliver electricity to the grid without producing process steam². Only one of two modes could be used at one time.

B. Chronology

This chronology is based on details found in the Pennsylvania Department of Environmental Protection’s (PADEP) letter to us dated April 22, 2002. On December 1, 1986, Sun Refining and Marketing Company, herein referred to as Sunoco, submitted a plan approval application to PADEP for the installation of the Unit at Sunoco’s facility located at Delaware and Green street in the Borough of Marcus Hook, Delaware County, PA. PADEP issued permit No. 23-399-018 to construct this turbine on June 19, 1987.

As discussed in more detail below, although the permit (No. 23-399-018) for the Unit indicated that it would be used to generate steam for Sunoco refinery operations and electricity

¹The current configuration does not allow the operation of dampers associated with the stack

²A small amount of steam is used for emissions control.

for sale to the local electric utility (PECO), Evidence leads us to conclude that Sunoco did not run the unit in the electricity-only mode.

In May 1999, FPL Energy purchased the Unit from Sunoco. The sale did not change the physical location of the Unit (which is located within the boundaries of the Sunoco Marcus Hook, Pennsylvania refinery). On January 25, 2002, PADEP received a letter from FPL, who proposed to make certain changes, characterized as “repairs,” to the existing secondary emissions stack of the Unit (the “Stack” or “Bypass Stack”). FPL requested a meeting with your office to discuss this modification, which would give the flexibility to unit so it could operate in either the either the electricity-steam mode or the electricity-only mode. They characterized this as “full operations.” [See letter: FPL to PADEP dated January 24, 1999 and Section I.B for a discussion of the proposed changes].

FPL in its letter to PADEP on March 7, 2002, claimed that the changes to the bypass stack and associated dampers³ “to restore full operation of the Cogeneration Facility” were exempt from review under the Prevention of Significant Deterioration (PSD) regulations, because “such repairs constitute ‘routine repair replacement or maintenance’.” On March 22, 2002, your office sent a letter to FPL requesting additional information regarding the proposed project.

PADEP’s letter dated April 22, 2002 to Region III requested our assistance in this matter. In our June 10, 2002 e-mail to your office, we wanted to know if Sunoco had primarily operated the turbine in the steam-electricity mode⁴ or was the unit operated primarily in the electricity-only mode.⁵

In e-mails dated June 12 and June 13, 2002, PADEP has indicated to us that Sunoco did not primarily operate the turbine in “fully functional mode”⁶ and the information provided in their e-mail dated August 30, 2002 seems to bear this out [see section D, “Historical Operation of the Unit”]. According to PADEP, Sunoco used the turbine in the electricity-steam mode, only at such times as the additional steam was needed by the refinery. Otherwise, the turbine

³The dampers are devices in the exhaust portion of the Unit and function similar to control valves allowing turbine exhaust to the heat recovery steam generator (HRSG) to produce steam or to by pass the HRSG to allow production of electricity without producing steam.

⁴See Footnote (1)

⁵ This was our understanding of the term “full operations,” as used by FPL in its January 24, 2002 letter—we contrast “full operations” with the unit being constrained to operate only one way, with the bypass stack permanently closed to produce steam for refinery processes along with electricity (the way it is currently operated).

⁶We use the term “fully functional mode to mean the same as “full operations”, i.e., the ability of the Cogeneration unit to be operated in electricity-only mode or electricity/steam mode.

was not operated. It appears from the evidence provided by PADEP, Sunoco never wanted to produce electricity only steam, however, they did not decouple the turbine from the electrical generator, so that every time they operated the turbine to produce steam they also produced electricity. PADEP also indicated that approximately four years after Sunoco received permit, No. 23-399-018, for this Unit, Sunoco physically modified the bypass stack so that the turbine could not be run with the bypass open. That is, Sunoco physically prevented the unit from operating in the “fully functional mode”, i.e., Sunoco removed the capacity for the unit to operate in electricity-only mode. To recover the flexibility to operate in either of two modes would require undoing the physical modifications performed on the bypass stack by Sunoco sometime in the early 1990's.

C. FPL's Proposed Changes to the Unit

FPL proposes to make changes to the bypass stack. The bypass stack is located in the turbine exhaust stream, just before the heat recovery steam generator (HRSG). According to the information contained in the e-mails and letters referenced above, we understand that the proposed changes to the bypass stack consist of removing a metal plate Sunoco installed inside the Bypass stack. The plate replaced the damper that was originally there. FPL proposes to install a completely new damper and associated parts in the Bypass stack, thereby allowing the operation of the bypass stack damper system that Sunoco had physically closed off in the early 1990's. Once FPL has made these changes, the bypass can be opened when the facility wants to bypass the HRSG. Bypassing the HRSG will allow this Unit to operate in either the electricity-only mode, or the electricity-steam mode which is the mode it is currently limited to. In short, we believe this is what FPL means when they use the term, “fully operational mode.”

D. Historical Operation of the Unit

As stated in the plan approval No. 23-399-018, dated June 19, 1987, Sunoco originally intended to use the Unit to generate electricity for sale to PECO and steam for its refinery. However, Sunoco, according to PADEP's 6/12/2002 e-mail to us, never actually operated the Unit for any reason other than to generate steam to supplement its process steam. Based on information from PADEP, for a period of 15 years, Sunoco (and FPL after it acquired the Unit) always operated the Unit in electricity-steam mode, with the bypass closed. FPL currently operates the Unit to provide steam to Sunoco based on the refinery's demand for steam. If Sunoco does not need the steam FPL does not operate the Unit. The operating data provided by PADEP [see e-mail from G. Monasky to P. T. Wentworth dated August 30, 2002] shows that the unit spent an approximately equal part of its time operating at about 50% power or shut down.

II. PSD Applicability

The project to alter the bypass to the Unit is subject to preconstruction review and permitting under the Clean Air Act's (“the Act”) PSD provisions if it is a “major modification”

within the meaning of the Act and EPA’s regulations. The federal PSD regulations under 40 C.F.R. Part 52 govern this analysis because Pennsylvania has incorporated-by-reference the federal PSD regulations into its SIP-approved state regulation, 25 Pa. Code §§ 127.81 - 83. These regulations impose emissions control and other requirements upon certain new or modified “major stationary sources” of air emissions in the Commonwealth of Pennsylvania.

As an initial matter, the PSD regulations only apply to major sources. PADEP has identified the Unit as a “major stationary source” within the terms of the PSD program. PADEP must evaluate whether the changes FPL proposes amount to a “major modification” for PSD purposes. The definition of “major modification” given at 40 C.F.R. § 52.21(b)(2)(i) requires us to analyze several factors that may be grouped under two general questions:

- Will the work entail a “physical change in or change in the method of operation of a major stationary source”? If so,
- Will the change “result in a significant net emissions increase of any pollutant subject to regulation under the Act”? See 52.21(b)(2)(i).

If the answer to both questions is “yes,” the major stationary source is subject to the PSD permit program requirements.

A. Physical Change or Change in the Method of Operation

1. Physical Change

The proposed changes to the FPL turbine bypass consist of unsealing the Bypass stack and restoring the damper system that is used by the Bypass stack. The changes represent a “physical change” to the Unit for PSD purposes unless exempted. FPL has claimed that the changes are exempt as routine maintenance, repair and replacement.

In analyzing whether proposed work at an existing facility is “routine,” the permitting authority makes a case-by-case evaluation weighing the nature, extent, purpose, frequency, and cost of the work, as well as other relevant factors, to arrive at a common-sense finding.

As set forth in detail below, after considering the available information herein, EPA believes that the changes to the bypass stack and the damper to make these components of the Unit operational for the first time in over a decade, do not qualify as routine maintenance, repair or replacement activities.

(a) Nature and Extent of the Changes

The information PADEP has supplied indicates that the Unit historically has operated only at such times as Sunoco’s other steam supplies were inadequate for operation of the refinery

processes. In addition, the Unit has never operated the unit in electricity-only mode. In fact, we understand that Sunoco physically configured the Unit about a decade ago to limit it to the electricity-steam mode to produce steam when it needed it. This physical change by Sunoco made it impossible for the unit to produce electricity alone. That configuration is precisely what FPL seeks to now undo. Undoing Sunoco's physical change to the Unit gives the unit an additional operational mode, namely the electricity-only mode. Reconfiguring the bypass stack means that the operating hours of the Unit can be expanded from the former restrictive electricity-steam mode which was configured by Sunoco for its need at times for additional process steam. This additional mode is an obvious enhancement designed to expand the historical capabilities of the Unit. In addition, the re-installation of parts, components or equipment that were removed about a decade ago, which are not part of the current operating configuration of the Unit for over a decade, and which have not been relevant to the restrictive operation of the Unit, should be considered an "addition" of parts. The proposed changes to the unit are not trivial. We consider this strong evidence of a non-routine change.

FPL has indicated that the changes will be performed during a routine scheduled outage when the turbine is not in operation and asserts that many routine repairs must be performed when the Unit is not operational. FPL also stated that it would take about two weeks to do the changes to the Unit. In light of the other evidence discussed herein, it is important for the PADEP to consider if two weeks of complete in-operation for the purpose of completing the proposed changes more than a de minimis outage and supports a non-routine description of the proposed changes.

(b) Purpose

The purpose of the proposed change is to restore an operational mode (the electricity-only mode) which by design the unit has been physically incapable of achieving for over a decade. We consider this evidence that the changes are not-routine.

(c) Frequency

From the information contained in FLP's April 23, 2002 letter, the changes FPL is proposing will be a singular event for this Unit. The changes proposed would only have to be carried out again if at some point the Bypass stack and associated damper are again physically sealed off from the steam flow (as Sunoco did some time in the early 1990's) to prevent generation of electricity and no steam, and, subsequently, that decision is again undone.

We feel the unique nature of the proposed changes in the operating life of the Unit support a finding that such changes are not "routine".⁷

⁷Unique events are hard to square with the dictionary definition of "routine" which is "of commonplace or repetitious character." See Webster's New Collegiate Dictionary. If PADEP were to consider the above definition alone (which we do not necessarily advocate), then the unique nature of this change would likely be sufficient to disqualify the proposed changes as being "routine."

(d) Cost

FPL estimated the cost of the proposed changes to be \$133,000. Based on current information, FPL estimates that the replacement of the turbines and associated equipment would cost in the range of \$15-18 million.

While there is nearly two orders of magnitude difference between the estimated cost of the proposed changes and the cost of the entire Unit, perhaps the cost of the changes should be compared to the cost of replacing only the Bypass stack. Also, the cost of these changes should, perhaps, be compared to the historical costs incurred in repairing and maintaining this Unit over the nearly fifteen years it has been in operation. In short, this maybe a more reasonable way evaluate whether the project cost of \$133,000 is an amount that would or would not support or the “routine” nature of the proposed changes.

Furthermore, PADEP asked FPL if a significant amount of the cost of the change will be included in the source’s capital expenses or will the change be funded from the operating budget. FPL replied that a significant amount of the cost of the changes will be funded from their operating budget. We consider changes that are funded capitally are more likely to not be routine. However, this is not dispositive. We recommend that PADEP further investigate FPL's distinction of significant versus insignificant expenses to determine how much of the changes will be funded capitally.

While the limited cost and funding information currently available lend support that the changes may be routine, we find at this time that there are other more significant factors that support a finding that the proposed project is not routine.

B. Conclusion

The Unit has operated for about 15 years in the electricity-steam mode without use of the Bypass stack, and that the Bypass stack had been intentionally made physically inoperable and has remained that way for a decade. FPL’s proposed changes will alter the existing components of the Unit by re-installing equipment that was removed about a decade ago, thereby, allowing the Unit to operate in a manner that is physically impossible in its current configuration. We believe that as a common-sense finding, based on weighing the information given to us, that the proposed changes could not be characterized as routine maintenance, repair or replacement; and as such, are not exempt from the PSD program. PADEP, of course, must make such finding after weighing the information available to them. We believe that the proposed changes are physical changes to the bypass stack and dampers that will allow FPL to put these components into service for the first time in the operating history of the Unit. It is a fact that the proposed changes have never been done before to this Unit, and, it is not reasonably foreseeable that similar work will ever be done again during the lifetime of this Unit. The necessary parts to carry out the project are not on site. Carrying out these changes will result in the Unit being

completely inoperable for an estimated two weeks. The cost of the changes is estimated to be \$133,000.

Primarily because of the unique nature of the changes; but also because the changes involve installation of equipment that have not been part of the Unit for about 10 years (i.e., they have been absent from the Unit for more than twice as long as they were present); because the changes will allow the Unit to produce a produce electricity when is not convenient to produce steam which has never occurred in its 15 year history); because the equipment in question is not kept in stock at the facility; because the proposed changes appear to have been scheduled independent of other potential repair and maintenance projects; and in addition, because at least a part of the project's funding may be derived from capital funds, we believe that PADEP would be well within the regulations if they decide that the proposed changes are not routine. It is clearly reasonable for PADEP to interpret the facts to support the conclusion that the proposed changes to the Unit are not a regular, customary, or standard undertaking for the purpose of maintaining the plant in its present condition.

It is not unreasonable for PADEP to question the ostensible short length of the down-time period (two weeks) and the cost of the project (\$133,000), and the representation that a "significant" amount of the project funds may be derived from the operating budget, outweigh the other factors discussed above.