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March 15, 2004

Mr. Al Linero
Florida Department of Environmental Protection
Division of Air Resource Management
111 South Magnolia, Suite 4
Tallahassee, FL 32301

Via FedEx
Airbill No. 7917 9627 5080

Re: Tampa Electric Company
Polk Power Station Unit 1
Air Piping Permitting Exemption
Permit No. 1050233-012-AV

Dear Mr. Linero:

On September 13, 2002, Tampa Electric Company (TEC) submitted a letter to notify the Florida Department of Environmental Protection (FDEP) of a capital improvement project that was planned for Polk Power Station (PPS) Unit 1. The capital improvement project referred to in the letter would allow the PPS Unit 1, while firing syngas, to comply with the new NO_x emission permit limit of 15 parts per million dry volume (ppmvd) @ 15% O_2 on a 30-day rolling average effective July 1, 2003. The project consisted of three phases which were to 1) install a syngas saturator, 2) increase the airflow to the air separation unit (ASU) for additional diluent gaseous nitrogen (DGAN) production by making modifications to its main air compressor (MAC), and 3) increase the capability for DGAN delivery through upgrading the diluent N_2 compressor. Out of the three phases proposed, phase one (the syngas saturator) has been completed. The saturator has performed well enough to enable PPS Unit 1 to temporarily meet the new NO_x emission limit, but unfortunately it has had one unexpected adverse impact on plant operations. The additional water vapor, which the saturator adds to the syngas, reduces the combustion turbine exhaust temperature, lowering the efficiency of the station's steam cycle. In addition, the need for phase two (additional airflow) to meet the new NO_x emission limit still exists. However, the detailed engineering design work for phase two indicated that the MAC modifications would have to be much more extensive than those identified in the September 13, 2002 letter. As a result, phase two must be modified to provide the additional airflow from another source and also to mitigate the adverse impact from the syngas saturator. TEC plans to begin installation and construction of the modified phase two on the fall 2004 planned outage. TEC has evaluated the potentially applicable air quality regulations that address this emissions unit, and has concluded that the planned change does not constitute a modification, hence does not require permitting or a permit modification. Through this submittal, TEC is seeking DEP concurrence on this matter.

TAMPA ELECTRIC COMPANY
P. O. BOX 111 TAMPA, FL 33601-0111
(813) 228-4111

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HTTP://WWW.TAMPAELECTRIC.COM

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HILLSBOROUGH COUNTY (813) 223-0800
OUTSIDE HILLSBOROUGH COUNTY 1 (888) 223-0800

This letter will describe the modified phase two. It is organized as follows:

- Background;
- Planned Capital Improvement Projects;
- Impact of Project on Air Quality Emissions;
- Regulatory Analysis;
- Closing;
- Attachment A – Responsible Official Signature
- Attachment B – Professional Engineering Certification
- Attachment C – Process Improvement Details
- Attachment D - Drawings

1.0 BACKGROUND

The PPS Unit 1 was originally permitted for operation on syngas with a NO_x emissions limit of 25 ppmvd (15% O_2). This Best Available Control Technology (BACT) limit for Unit 1 was established prior to actual operation of this unique unit before the ultimate system performance was known. The permit stipulated that a second BACT analysis would be performed on the unit after the demonstration period was complete in 2001.

The second BACT analysis was completed, and on February 5, 2002, the FDEP issued a final air quality permit (FDEP Permit No. 1050233-007-AC), which reduced the NO_x emissions limit for Unit 1 on syngas to 15 ppmvd (15% O_2). This emissions limit was arrived at after extensive information interchange between TEC and the FDEP, and constitutes a negotiated settlement on the emissions limit. The compliance deadline for the new emission limit was set for July 1, 2003. This new emissions limit of 15 ppmvd (15% O_2) was more stringent than TEC believed Unit 1 could consistently meet without capital improvements. Thus, TEC embarked on a capital improvement project consisting of three phases to enable Unit 1 to meet the newly established emissions limit.

The first of these phases, the syngas saturator, was successfully commissioned in May 2003, enabling Polk Power Station to comply with the 15 ppmvd (15% O_2) NO_x limit. The saturator adds moisture (water vapor) to the syngas to reduce the flame temperature, resulting in lower NO_x production.

The saturator has performed well, but it has one unexpected adverse impact. The additional water vapor, which the saturator adds to the syngas, reduces the combustion turbine exhaust temperature, lowering the efficiency of the station's steam cycle. The saturator design calculations assumed the combustion turbine's inlet guide vanes would throttle the combustion airflow to compensate for the added moisture. However, this cannot occur in practice since it would reduce the airflow to the point that the compressor would surge. The combustion turbine's manufacturer, General Electric, does not provide its compressor performance curves to their customers, so this adverse impact could not have easily been anticipated.

Despite the fact that the saturator is performing well, the needs for additional airflow (phase two) and possibly for additional DGAN delivery capability (phase three) still exist.

2.0 MODIFIED CAPITAL IMPROVEMENT PROJECT PHASE TWO

Instead of continuing to operate inefficiently and close to the combustion turbine's surge point as described above, the revised phase two involves extracting excess air from the combustion turbine's compressor, which will move the compressor away from its surge point, and increase the turbine exhaust temperature for better steam cycle performance. TEC will then cool the extracted air by generating low pressure steam, boost its pressure slightly, and inject it into the discharge line of the ASU MAC. This change only involves rerouting compressed air within the station, and it meets the objective of the original phase two, increasing the airflow to the ASU. More ASU airflow will in turn provide more nitrogen for use as a diluent in the combustion turbine.

The overall capital improvement project, including the modified phase two, is discussed in additional detail in Attachment C of this letter.

Because of the complex adverse impact of the syngas saturator, the unique facility configuration, and limited equipment availability (i.e., only during outages), it is necessary for TEC to immediately begin the ordering and installation of equipment for these process changes.

3.0 IMPACT OF PROJECT MODIFICATION ON AIR QUALITY EMISSIONS

The purpose of phase two is to enable the facility to consistently meet the NO_x emissions limit of 15 ppmvd (15% O_2). By providing additional air to the ASU, the ASU will produce more diluent nitrogen. The additional diluent nitrogen will then be used as needed to comply with the NO_x emissions limit. In addition, phase two will move the compressor away from its surge point and aid the steam cycle performance.

The modification to phase two is expected to further decrease the air emissions from the facility. This modification will slightly increase the parasitic load (i.e., operating electrical requirement) on the system because of the blower needed to boost the combustion turbine's air for injection into the ASU. However, this small increase in parasitic load will be more than offset by the increase in efficiency achieved as a result of:

a) better utilization of the syngas saturator,
b) use of additional available diluent nitrogen,
c) higher combustion turbine exhaust temperature for better steam cycle performance, and
d) elimination of the need to increase the MAC power consumption to produce the added airflow.

Thus, this project modification is expected to increase the overall operating efficiency of the process, and therefore will not cause an increase in the emissions of any regulated pollutants from this unit.

4.0 REGULATORY ANALYSIS

TEC has evaluated the potentially applicable air quality regulations that address this emissions unit, and has concluded that the planned change does not constitute a modification, hence does not require permitting or a permit modification. This analysis is summarized in this section. However, because this determination is subject to some level of interpretation, TEC is requesting that FDEP respond in writing, indicating their concurrence with this interpretation.

First, the facility is subject to provisions of NSPS Subpart GG, Standards of Performance for Stationary Gas Turbines, for the operation of the combustion turbine. This change is clearly not a modification for two main reasons. First, these process changes will not increase the regulated pollutant emissions from the combustion turbine. Second, pollution prevention projects are clearly identified as exempt from being considered a modification. The pertinent portion of the definition of the term modification, as contained in 40 CFR 60.14 is reproduced following.

> *(a) Except as provided under paragraphs (e) and (f) of this section, any physical or operational change to an existing facility which, results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies shall be considered a modification within the meaning of section* 111 *of the Act. Upon modification, an existing facility shall become an affected facility for each pollutant to which a standard applies and for which there is an increase in the emission rate to the atmosphere.*
>
> *(e) The following* ***shall not, by themselves, be considered modifications under this part****:*
>
> (5) ***The addition or use of any system or device whose primary function is the reduction of air pollutants****, except when an emission control system is removed or is replaced by a system which the Administrator determines to be less environmentally beneficial.*

The facility underwent the Prevention of Significant Determination (PSD) permitting process for the construction permitting of Unit 1. Because there is no increase in PSD subject pollutants as part of this change, this change is not subject to the PSD permitting process. Additionally, the driving force for performing this change is the revised BACT emissions limit. This revision was required by the initial BACT determination. Therefore, it is not required to revisit the BACT determination or PSD permitting process as a result of these planned changes.

The Florida DEP defines modification in FAC 62-210.200 (169) as follows.

> (169) *"Modification" - Any physical change in, change in the method of operation of, or addition to a facility which would result in an increase in the actual emissions of any air pollutant subject to regulation under the Act, including any not previously emitted, from any emissions unit or facility.*
>
> 1. *A physical change or change in the method of operation shall not include:*
>   a. *Routine maintenance, repair, or replacement of component parts of an emissions unit; or*
>   b. *A change in ownership of an emissions unit or facility.*

2. *For any pollutant that is specifically regulated by the EPA under the Clean Air Act, a change in the method of operation shall not include an increase in the hours of operation or in the production rate, unless such change would be prohibited under any federally enforceable permit condition which was established after January* 6, 1975.
3. *For any pollutant that is not specifically regulated by the EPA under the Clean Air Act, a change in the method of operation shall not include an increase in the hours of operation or in the production rate, unless such change would exceed any restriction on hours of operation or production rate included in any applicable Department air construction or air operation permit.*

Because the planned changes for Unit 1 will not increase the emissions of any regulated pollutant, these changes are not considered a modification per the Florida air quality rules.

5.0 CLOSING

TEC appreciates the cooperation and consideration of the Department in this matter. Due to the timing that is associated with the procurement and installation of the required equipment to effect the planned changes, TEC plans to commence with this project as soon as possible. TEC would appreciate an expedited review of this information. If the DEP determines that permitting is necessary, TEC requests a written response outlining the requirements.

If you have any questions or comments pertaining to this request, please contact Raiza Calderon or me at (813) 228-4369.

Sincerely,

Laura R. Crouch

Laura R. Crouch
Manager – Air Programs
Environmental, Health & Safety

EA/bmr/RC174

Enclosure

c/enc: Mr. Jerry Kissel, FDEP –SW

ATTACHMENT A - RESPONSIBLE OFFICIAL CERTIFICATION

I have reviewed the information contained in this letter. I hereby certify that these documents are authentic and accurate to the best of my knowledge.

Date: 3/11/04

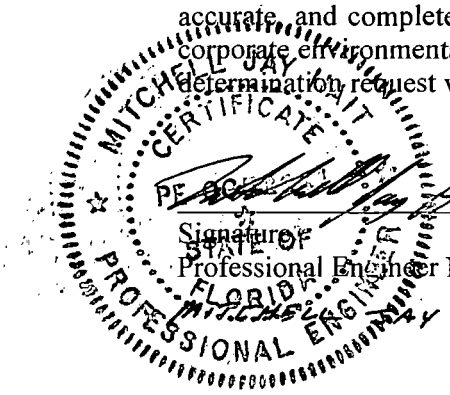
Signature: Mark J. Hornick

General Manager
Polk Power Station

ATTACHMENT B - PROFESSIONAL ENGINEERING CERTIFICATION

I, the undersigned, hereby certify that:

To the best of my knowledge, the information reported in this determination request is true, accurate, and complete based upon information presented to me by the facility engineering and corporate environmental staff, and reasonable techniques available for estimating emissions. This determination request was prepared under my direct supervision.



PE 52281 Mitchell Jay Hait

Signature of
Professional Engineer No.0052281

MARCH 12, 2004

Date

NOTE: All substantive changes from the process improvement details provided in TEC's September 13, 2002, letter are shown as "red line / strike out" in this attachment.

Phase one of the overall project is the humidification of the syngas through the installation of a syngas saturator that is depicted in Figures 1A and 1B in Attachment D. Figure 1A shows the current configuration of the low temperature gas cooling section of the plant and Figure 1B shows the planned future configuration. An existing column called the Water Wash Column will be modified to become the syngas saturator. In the current configuration, syngas flows from the coolers through the Water Wash Column and into the Methyl Diethanol Amine (MDEA) Absorber, where sulfur species are removed. In the future configuration, the flow path will be modified whereby the syngas will first flow through the MDEA absorber and then to the saturator column. In the saturator, the syngas will be contacted with a counter-current flowing stream of hot water. As the syngas passes from the bottom to the top of the column, it will be warmed and humidified by the warm water flowing downward. The syngas will leave the column with approximately 5% water vapor that is expected to reduce NO_x emissions by 3 to 5 ppmvd. The saturator will add the equivalent of about 50 gallons per minute (gpm) of water to the syngas. This additional water will come from the existing plant water wells; therefore, no additional water will be withdrawn from the water table. However, additional water treatment facilities will be included to purify the water for the saturator.

Phase one of the overall project is expected to be performed according to the following timetable. Beginning in late summer 2002, piping will be fabricated to reroute the syngas around the current water wash column. This bypass piping will be installed in the fall 2002 planned outage. Next, between the fall 2002 planned outage and the spring 2003 planned outage, modifications will be made to the water wash column internals and the other key equipment (e.g., heat exchanger, pump, and water treatment equipment) will be procured and put in place. Finally, in the spring 2003 planned outage, the last piping spool modifications will be made to place the new saturator in the syngas flow path. The system will be commissioned during subsequent operation between the spring 2003 outage and the required in-service date of July 2003.

NOTE: Phase one was completed as described above.

The second phase of the overall project is to increase the airflow to the ASU thereby making more diluent N_2 available. Currently, all diluent N_2 is provided by the ASU. The compander system provides refrigeration for the cryogenic separation of the air into its primary components, N_2 and O_2. This second phase will ~~increase the capability of main air compressor (MAC) within the ASU to~~ provide additional air to the ASU and increase the refrigeration capability of the companders such that more diluent N_2 will be available. The scope of this second phase is to:

(a) ~~install guide vanes in stages two through four on the MAC;~~withdraw air from the combustion turbine's air compressor, cool it by generating low pressure steam, boost its pressure slightly, and inject it into the discharge of the ASU's MAC,
~~(b) upgrade the MAC motor components as required to ensure that it meets the additional horsepower requirements;~~ and
(~~e~~b) modify the companders and associated piping to ensure adequate column refrigeration.

Attachment D, Figure 2 presents a flow diagram of the ASU and depicts the new aspects of this second phase of the overall project.

~~The installation of additional guide vanes in the MAC will increase the compressor flow capacity by approximately 5%.~~ Because of the saturator, the combustion turbine's air compressor has additional capacity which will be utilized in the ASU. This additional air supply from the ~~MAC~~ combustion turbine compressor will be delivered to the ASU's cryogenic column thus providing additional N_2 for injection into the combustion turbine via the diluent N_2 compressor. ~~There will be minor modifications to the MAC's motor to ensure that motor components are capable of sustaining the higher power requirements.~~ The companders, that supply most of the refrigeration to the column, will require upgrading to ensure that the column can liquefy the additional airflow ~~from the MAC~~.

Phase two of the overall project is expected to be performed according to the following timetable. The ~~MAC guide vanes~~ air coolers and booster compressor for the extracted air and compander upgrades will be purchased with a sufficient lead-time such that their installation will occur during the fall ~~2002~~ 2004 planned outage.

The third phase of the overall project is the modification of the controls and the installation of additional guide vanes to the diluent N_2 compressor. The result of phase two of the overall project will make additional DGAN available for injection into the turbine. However, the DGAN is only available at 35 psig from the cryogenic separation section of the ASU. Therefore, compression is needed and the diluent N_2 compressor in the current configuration will not be able to handle the additional load of more diluent N_2 flow. Phase three of the overall project will remedy this situation. This phase will require the installation of additional guide vanes in the diluent N_2 compressor to achieve the increased capacity necessary to sustain the greater flow of DGAN. ~~This modification is similar to the MAC modification in phase two of the project.~~

Phase three of the overall project is expected to be performed according to the following timetable. The diluent N_2 compressor modification is scheduled to occur no later than the spring ~~2003~~ 2005 planned outage. In addition, control system modifications will be made in late ~~2002~~ 2004 to assure stability of control in order to deliver maximum DGAN to the turbine while maintaining overall plant control stability during load changes.

ATTACHMENT D - DRAWINGS

FIGURE 1A: INITIAL DESIGN: LOW TEMPERATURE GAS COOLING, WATER WASH COLUMN AND MDEA

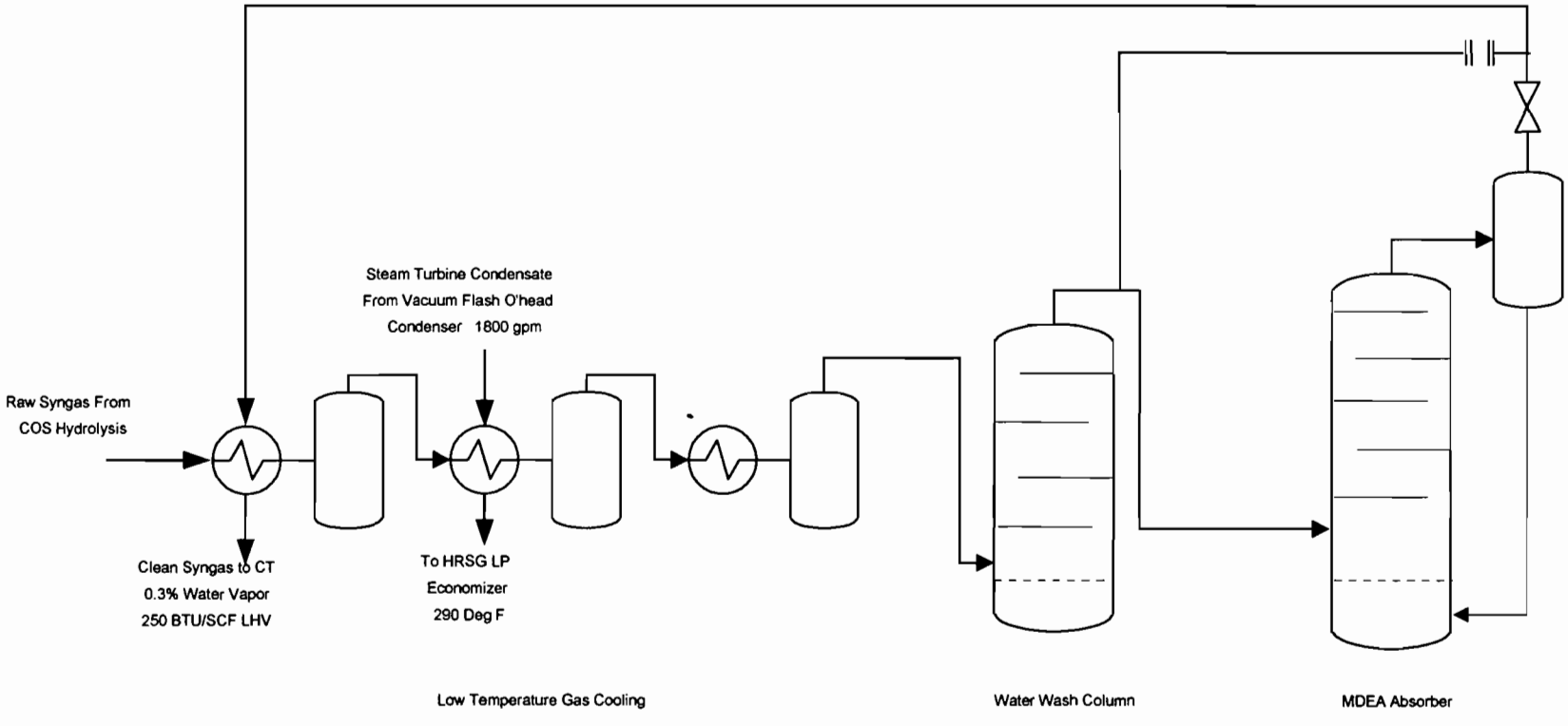


FIGURE 1B: LOW TEMPERATURE GAS COOLING, SATURATOR AND MDEA AFTER PHASE I

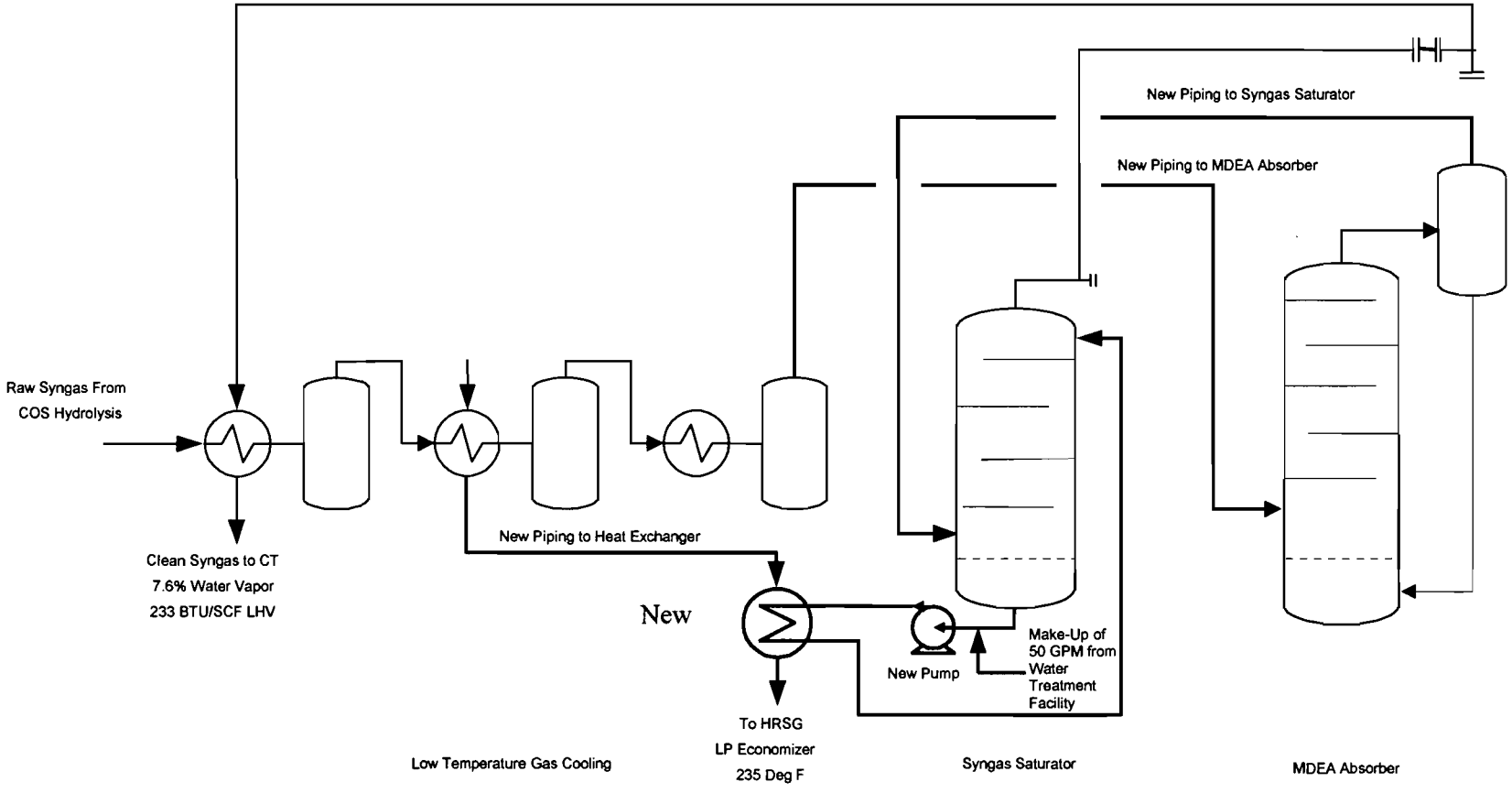


FIGURE 2: AIR SEPARATION UNIT – PHASES 2 AND 3