Washington Group International
Integrated Engineering, Construction, and Management Solutions

TAMPA ELECTRIC COMPANY
BIG BEND POWER STATION

Project Number 28975-001

COAL FIELD STUDY – PHASE I

Prepared for

TECO
TAMPA ELECTRIC

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1.0 EXECUTIVE SUMMARY

1.1 Objective

The fundamental objective of this two (2)-phased study approach is to determine the means by which coal handling reliability can be improved to effect an increase in plant availability and/or capacity at the Big Bend Station. Tampa Electric Company (TECO) indicates that some portions of the coal handling system limit overall handling capacity and, therefore, the steam generating capacity of the boilers at times becomes limited. TECO requested that this study include investigation and recommendations for an emergency bypass operation to assure plant availability.

This Phase I Report consists of gathering, collating, and analyzing information about the Big Bend Coal Handling System, including plant records, documents, previous reports, employee interviews, etc. It identifies equipment or systems requiring more detailed examinations and recommendations for upgrade or modifications during Phase II.

Phase II involves analyzing the results of Phase I and providing repair and/or modification recommendations including budget estimates and schedules.

1.2 Scope of Phase I

Washington Group International performed the Phase I effort in accordance with TECO's Exhibit C Scope of Work Document, dated September, 26 2006. In performing Phase I, Washington Group worked closely with team members from TECO Energy.

Specifically, the effort included the following items:

1. Review of the existing coal handling system and associated equipment including pertinent information such as operating practices, maintenance practices, drawings, etc.
2. Review of equipment arrangements. The extent of the study encompassed from the barge unloading system to the tripper conveyors above the bunkers.
3. Investigation of the plant coal handling system throughput requirements including identifying the existing back up coal handling arrangements during equipment failures.
4. Interview of plant operating and maintenance personnel to identify problem areas.
5. Review of previous reports including Air Control Science Report dated January 23, 2006, Metso Minerals Report dated July 25, 2003, and Neill and Gunter Structural Assessment – 2003.
6. Compile the results of Phase I activities into a report and submit to TECO for review, which is included in this document as Attachment A.

1.3 Results And Recommendations

The Coal Handling System at the Big Bend Station was a state of the art facility at the time of it's original commissioning. Even though some of it's components are somewhat dated, the fundamental concepts of the system are still sound and although there has been deterioration, there is no technical reason why it cannot be returned to a condition to provide adequate service into the foreseeable future.

1.4 Findings

The Phase I investigation revealed a number of problem areas, including what appears to be original design flaws or oversights, modifications and fixes which have created their own problems, and portions of the system which have undergone significant deterioration.

Problem areas and shortcomings noted in the Phase I investigation are delineated in Attachment A of this report, however major areas of concern are the significant deterioration of many coal transfer points, and the condition of the structural steel.

1.5 Recommendations for Phase II

Based on the results of the Phase I effort as outlined in Attachment A, it is recommended that more detailed inspections and / or recommendations for modifications on the following items be performed during the Phase II effort: Each investigation should include budget pricing and a schedule for it's implementation.

1. Investigation of crossover capability between existing conveyors Q1 and Q2 and existing blending bin tripper feed conveyors R1 and R2.
2. Investigation of existing blending bin tripper feed conveyors R1 and R2 travel to get increased capacity for existing bins 1A and 1B and 6A and 6B.
3. Investigation of crossover capability between existing conveyors L1 and L2 and existing plant silo feed conveyors N1 and N2.
4. Investigation to provide new stacker reclaimer machine to replace existing bucket wheel stacker reclaimer No. 1. Options may include blending type machines. The yard belt conveyor and support structure is planned to be included.
5. Investigation to provide new machine to replace existing stackout conveyor No. 2. Investigation will replace existing machine with a machine to stackout and reclaim to replace the existing movable reclaim machine ML50. Options may also include blending type machines. The yard belt conveyor and support system will also be included.
6. Determine with TECO which transfers need immediate replacement or refurbishment and prioritize for each.
7. Determine with TECO which structures need immediate replacement or refurbishment and prioritize for each.

2.0 METHODOLOGY

2.1 Initial Assessment Approach

This report covers Phase I of the two-phase approach being used by TECO to assess the Big Bend Station Coal Handling System. Based on the critical components identified in the scoping effort of Phase I, additional inspections and or recommendations for modifications will be performed in Phase II.

Phase I activities included the following:

1. Review of plant records and reports, including manufacturers inspection reports.

2. Interviews were held with the following TECO personnel:

Name	Position
Tim Muncy	Coal Yard Supervisor
RC Smith	Maintenance Supervisor
Jessica Helkin	Plant Engineer
Various Personnel	Coal Yard Work Crew

3. Performed two plant walkdowns to visually inspect equipment and structures. In general, the walkdowns occurred while system was in operation and therefore close inspection of equipment could be performed.

4. Priority matrices were established, utilizing standard evaluation criteria developed by Washington Group, to select systems/components requiring further detailed inspections, or recommendations for modifications in Phase II.

5. Results of Phase I activities and evaluations are documented in this Report in Attachment A.

2.2 Plant Evaluation Format

Phase I activities previously described in 2.1 are addressed in this report as follows:

1. Results of the plant walkdown inspection, review of plant records and interviews with TECO personnel are contained in Attachment A.

2. A broad overview is presented in Section 3.0 – Plant Evaluation.

3.0 PLANT EVALUATION

3.1 General

This section provides a broad overview of the coal handling system at the Big Bend Station. Information provided below was either observed or provided by plant personnel through the interview process. Specific observations and comments about selected equipment are provided in Attachment A.

3.2 Coal Transfer Points

1. Chutes and Hoppers - Corrosion, wear, numerous patches, and coal spillage was observed in chutes and hoppers throughout the system, which indicates a need for refurbishment or replacement.

2. Liners - No internal inspection was made of chutes. However, from interviews and visual observations from outside of the chutes, liners would need either replacement or refurbishment where chutes are in need of repair.

3. Skirts - Many rubber skirts, especially along the loading backplates, have worn to the point of allowing coal spillage and dusting.

4. Gates and Gate Operators - There were no indications of specific problems with diverter gates, either observed or from information gathered during the interviews.

5. Supports - Supports were observed to be in the same general corrosive state as the chutes.

6. Coal Flowability - During site walkdowns, chute pluggage and poor coal flowabilty were not evident but interviews with TECO' plant personnel revealed that many chutes have these specific problems, especially during wet conditions.

3.3 Conveyor Equipment

1. Idlers - In most cases idlers did not show serious wear. Some rollers were not turning but this was probably due to the belt not touching the roller, possibly because of belt tracking or varying backing heights.

2. Scrapers - Considerable build-up of coal was observed on floors and walkways due to what appeared to be carryover on return belt runs which is normally due to insufficient amount of scarpers or scrapers needing replacement, general maintenance and adjustments.

3. Pulleys, Bearings and Shafts - No overall pattern of failures or problems observed.

4. Guards - Some guards have been circumvented (cutouts) or removed, probably for lubrication access or cleanup.

5. Motors - Interviews yielded no comments on motors.

6. Reducers - Interviews yielded no comments on reducers. Observed coal accumulation on some reducers, which can contribute to overheating.

7. Backstops - No adverse comments were received on backstops.

8. Counterweights - No problems were noted with counterweighted take-ups, although some of the horizontal take-up guides were very corroded.

9. Supports and Connection Bolts - Excessive corrosion was observed on many stinger sections and supports along the conveyors especially with the yard conveyors. Connection bolts and gusset plates were often missing or totally corroded beyond repair.

3.4 Crushing Equipment

Interviews yielded fuel that is used at Big Bend does not require crushing and suggestions were made to either by-pass the crushers or eliminate the crushing altogether.

There is a flop gate above the crusher that does not work properly.

There is also a dusting problem related to the crushing equipment, chutework and casings.

For crusher housing, chutes and hoppers see Section 3.2, Coal Transfer Points, Item 1.

3.5 Magnetic Separators

No adverse comments were received or observed with the magnetic separators.

3.6 Yard Belt and Stack Out Boom for Stacker Reclaimer No. 1 (South)

The yard belt and stacker reclaimer boom both have excessive corrosion to stringers, support structures and connections. Interviews also have indicated a previous boom collapse and that the stack out rate is less than 4000 tph original design capacity.

There is excessive spillage related to chute back up conditions.

Boom belt has tracking problems that need to be resolved.

Interviews yielded numerous electrical and control problems.

According to the interviews, the south operation is more reliable than the north side but still requires major refurbishment and or replacement.

3.7 Stack Out Boom System For Stacker No. 2 (North)

The yard belt structure and stacker also have excessive corrosion related to the stringers, supports and connections.

Control cab is not used and needs replacement.

Automatic reclaim is not possible without the use of the portable (movable) reclaimer including mobile equipment.

According to the interviews, the north operation is not reliable and requires major refurbishment or replacement.

3.8 Blending Bin Feed System

There are a total of (6) six blending bins, which are each fed from two (2) traveling tripper type feed conveyors. An original design layout flaw limits the travel of the trippers and thus reduces the capacity of bins 1 and 6. The reduced capacity of these bins limit plant reclaim flexibility and is planned for further investigation during Phase II.

3.9 Blending Bins

The original design called for a total of (6) double outlet blending bins, which all are used for storage for the Big Bend Station. In the mid 90's the system was modified to allow bin No. 6 to be used for the Polk Station via a new truck loadout arrangement. This modification caused a reduction in capacity for the Big Bend Station of approximately 1500 tons of blended fuel. A project now under way is planning to modify the system to

also use Bin No. 5 for Polk Station and would therefore reduce the plants reclaim capacity and flexibility even further.

Interviews have also yielded that there is excessive wear and reported holes in some of the hopper side walls. Also the bin cut-off gates need replacement or refurbishment.

4.0 REPORT REVIEWS

4.1 Review of the Air Control Science Report

TECO subcontracted Air Control Science (ACS) to provide a Phase I Study related to the Big Bend Station material handling, dust control and fire protection systems. The ACS Report, dated January 23, 2006, included an in depth evaluation of the station's condition and provided a recommended program to improve the conditions.

In many cases, our general observations were the same as the ACS Report. ACS evaluated the potential risks of a catastrophic event occurring in each of the areas of the plant analyzed and provided a risk based priority list with 1 being the highest priority. Included in the list was the FGD system which is not part of this report. The Executive Summary including the priority list and the Introduction Section are in Attachment A.

4.2 Review of the Metso Minerals Report

Metso Minerals was asked to provide technical assistance during a scheduled outage in 2003 to replace a failed bucket wheel assembly on the south yard stacker reclaimer. In addition to the outage work Metso Minerals also did a spot check inspection of the major components of the south yard stacker reclaimer.

The spot check uncovered excessive wear in pin connections and major deterioration of structural members and badly worn counterweight ropes.

In general, Metso Minerals identified areas of vital concern where major work would need to be done.
The items that were pointed out as being major areas of concern are as follows:

1. Boom Hinge pins
2. Boom Structure
3. Trucks and equalizers
4. Tripper structure
5. Counterweight wire ropes

Washington Group International did not perform a detailed investigation to agree or not agree with the Metso findings.

4.3 Review of the Neil and Gunter Structural Assessment

The results from the review of the Neil and Gunter Structural Assessment will be provided during Phase II.

5.0 SYSTEM THROUGHPUT REQUIREMENTS

5.1 Existing System

The existing system capacities are listed in Attachment A and on existing Drawing No. 11473-FM-3G-4. It is reported that the Stacker Reclaimer No. 1 does not achieve the original design capacity of 4000 tph stackout rate.

6.0 EMERGENCY HANDLING SYSTEM ARRANGEMENTS AND OPTIONS

6.1 Phase II

During Phase II investigations, recommendations will be made to address the emergency reclaim system. There are 5 items (1-5) identified in section 1.5, which address these conditions.

7.0 LONG TERM APPROACH TO FUEL BLENDING FOR POLK STATION

7.1 Overview

The long term approach to fuel blending is being addressed under a separate contract between Tampa Electric Company and Washington Group International. The project includes modifications to the system that isolate existing blending bins 5A and 5B so they can be used in conjunction with existing blending bins 6A and 6B. The goal of this project will eliminate blending of fuels on the ground. It is anticipated that existing blending bins 5A and 5B will store coal and existing blending bins 6A and 6B will store coke. A new handling system to direct the coal from blending bins 5A and 5B will be installed and used to blend with the existing 6A and 6B system.

ATTACHMENT A

COAL YARD EQUIPMENT

RESULTS OF INTERVIEWS AND OBSERVATIONS

COAL YARD EQUIPMENT: RESULTS OF INTERVIEWS AND OBSERVATIONS

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
1	**Conveyor A**	4000 TPH, 72" Wide, 650 fpm	Good Condition; Starting to deteriorate, but still reliable and does not have any significant down time	1. The belt appears to track to the left side of the system. 2. There are two (2) traversing steel load chutes that travel with the Unloader Bucket Conveyors and load Conveyor A. These chutes have patch plates covering worn areas. 3. The skirt seal does not fully contact the belt, leaving a gap for dust and spillage to escape from. 4. Conveyor supports are in good condition.
2	**Conveyor B**	4000 TPH, 72" Wide, 650 fpm	Good Condition; Starting to deteriorate, but still reliable and does not have any significant down time	1. The belt has some side edge damage and cracks in the covers. 2. The belt appears to track to the left side of the system. 3. There is a large open area between the head chute and the receiving hopper which will increase the induced air through the chute and into the hopper. There is one access door in the head structure. The head pulley shaft seal areas are open. Existing head seal system allows induced air to enter the head chute. 4. Conveyor supports are in good condition. 5. The skirt enclosure allows spillage to occur and dust emissions to escape due to the design. 6. There are currently no skirt liners attached to the system. The existing tail seal does not conform properly to the belt profile. There are no dust curtains in the enclosure and the top of the enclosure is open.

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
3	**Conveyor D**	4000 TPH, 72" Wide, 650 fpm	Good Condition; Starting to deteriorate, but still reliable and does not have any significant down time	1. The belt was being replaced due to damage. 2. Deck plate, that runs the entire length of the conveyor, collects coal and rain or washdown water, creating a corrosion problem around the base of idlers and the system. 3. The guard, tail pedestal and stringer are all in fair condition. 4. The guards and limit switches are in fair condition. 5. The head chute is open in the back and missing the entry dust curtain. The large open area at the head chute increases the induced air through the chute and skirt enclosures. There are no access doors in the head structure. There is a primary belt cleaner in fair condition and a secondary belt cleaner that is missing the blade. 6. Conveyor supports are in fair condition. 7. Skirtboard, Wear Liners, and Edge Sealing Systems – The skirt enclosure is corroded, worn and it leaks. There is slab seal rubber skirting that is ½" off the belt. The existing skirt walls are straight to the belt line, and they are mounted ½" above the belt line. The wear liner is straight with a height of ½" above the belt line. The tail seal does not seal properly to the belt profile. The existing dust curtain is in poor condition.

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
4	**Conveyor E1**	4000 TPH, 72" wide, 660 fpm	Interview indicated that clean up expenditures are high for this conveyor.	1. The belt appears to track to the left. 2. The tail pedestal and stringer are corroded C-channel. 3. Loading Chutes – The chute is in fair condition with some corrosion. There are homemade access doors, with poor gasket sealing, that leak. 4. The stringer footings are corroded and existing deck plate is rusted through. The corroded deck plate presents potential problems to the belt and tail pulley. 5. The skirt enclosure is worn and leaks. There is considerable rollback and spillage around the skirt enclosure. The skirt seal is slab rubber in poor condition and set about ½" above the belt. The seal allows dust and material to leak out. The existing dust curtain is missing. The existing tail seal does not conform properly to the belt profile. 6. There is no tail pulley protection such as a "V"-plow or diagonal plow.
5	**Conveyor F1**	4000 TPH, 72" wide, 648 fpm	The entire conveyor structure is seriously corroded and appears to need complete replacement. A lot of the supports for the counterweight are almost rusted through. There are holes in the structure and the legs are rusted out and worn.. A lot of the conduit is broken	1. The belt has gouged covers and side edge damage. 2. Tail Pulleys and Transition Areas – The tail pedestal and stringer are corroded. Tail pulley and guards are in fair condition. 3. There are homemade access doors, in the loading chute, with poor sealing that leaks. 4. The deck plate is rusted and corroded. 5. Conveyor Supports – Steel is severely corroded, foundations are cracked and pieces are broken. 6. Skirtboard, Wear Liners, and Edge Sealing Systems –

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
			and in need of replacement or repair.	The skirt enclosure is worn and leaks. There is spillage around the skirt enclosure. The skirt seal is slab rubber in poor condition and set about ½" above the belt. The seal allows dust and material to leak out. The existing dust curtain is missing. The existing tail seal does not conform properly to the belt profile. There is a ½" gap at the tail seal. 7. Tail Protection Plows – There is no tail pulley protection such as a "V"-plow or diagonal plow.
6	**Conveyor Y**	4000 TPH, 72" wide, 650 fpm	Conveyor Y is a short conveyor that is reliable, and has few problems.	1. The belt has severe cover damage and appears to track to the right. 2. Tail Pulleys and Transition Areas – The zero speed and limit switches appear to be in good working condition. The guard is in good condition. The tail pedestal and stringer have corrosion. 3. The loading chute is in fair condition. There are homemade access doors with poor sealing that leaks. 4. The existing rusted and corroded deck plate present potential problems to the belt, tail pulley and belt support idlers. 5. Conveyor supports are corroded. 6. The skirt enclosure is worn and leaks. There is considerable rollback and spillage around the skirt enclosure. The skirt seal is slab rubber, in poor condition, and set about ¼" above the belt. The seal allows dust and material to leak out. The existing dust curtain is missing. The existing tail box appears to be

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
				narrow and material collects in this section. The tail seal does not conform properly to the belt profile. There is a ¼" gap at the tail seal. The existing tail box leaks. 7. There is no tail pulley protection such as a "V"-plow or diagonal plow.
7	**Conveyor Z**	4000 TPH, 72" wide, 650 fpm	There is a lot of spillage around the tail pulley, causing it to get buried. The structure is fragile and has been bent before. There is coal on the rail. The truck drives are broken.	1. The belt appears to be in fair condition and appears to track reasonably well. 2. Tail Pulleys and Transition Areas – The existing tail pulley is in fair condition. The guard is in poor condition. The tail pedestal and stringer are in fair condition. 3. The pivot seal, on the loading chute, leaks product and dust and is generally in poor condition. 4. The existing rusted and corroded deck plate presents potential problems to the belt, tail pulley and belt support idlers. 5. The conveyor supports are in fair condition. 6. The skirt enclosure is worn and leaks. There is considerable rollback and spillage around the skirt enclosure. The skirt seal is slab rubber in poor condition and set about ½" above the belt. The seal allows dust and material to leak out. The existing dust curtain is missing. The existing tail seal does not conform properly to the belt profile. 7. There is no tail pulley protection such as a "V"-plow or diagonal plow.

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
8	**Conveyor G1**	4000 TPH, 72" wide, 700 fpm	Generally good condition, but the skirting has deteriorated.	1. Belt is a direct dual drive unit and appears to have training and misalignment problems. 2. The existing tail pulley has good lagging. The tail pedestal and stringer are in poor condition with some corrosion. 3. Loading Chutes – The chute is in fair condition. There are two (2) homemade access doors with poor sealing. 4. Conveyor supports are in fair condition. 5. The skirt enclosure is worn and leaks. There is considerable spillage around the skirt enclosure. The skirt seal is slab rubber in poor condition and set about ½" above the belt. The seal allows dust and material leak out. The existing dust curtain is missing. 6. There is no tail pulley protection such as a "V"-plow or diagonal plow.
9	**Conveyor J1**	4000 TPH, 72" wide, 668 fpm	The belt scrapper is thinning out. The walkways are in bad condition and are completely worn out.	1. The belt is in fair condition but has side edge damage from misalignment. The belt splice is vulcanized and in fair condition. The belt appears to track straight. 2. The existing tail pulley guard is in fair condition. The tail pedestal and stringer are in poor condition with some corrosion. 3. There is corrosion in the loading chute. Open areas in the chute allow material spillage and air to enter the transfer zone. 4. The existing rusted and corroded deck plate presents potential problems to the belt, tail pulley and belt support idlers.

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
				5. Conveyor supports are in good condition. 6. The skirt enclosure is worn and leaks. There is rollback and considerable spillage around the skirt enclosure. There is considerable dribble from belt cleaners and snub pulley above. The skirt seal is slab rubber in poor condition, and set about ½" above the belt. The seal allows dust and material to leak out. The existing dust curtain is missing. The existing tail box does not properly conform to the belt profile and leaks. 7. There is no tail pulley protection such as a "V"-plow or diagonal plow.
10	**Conveyor P**	4000 TPH, 72" wide, 667 fpm	The rip-detector causes the conveyor to shut down for no reason. The entire conveyor structure is seriously corroded and appears to need complete replacement. A lot of the supports for the counterweight are almost rusted through. There are holes in the structure and the legs are rusted out and worn.	1. The belt appears to track straight, but there are several sections and joints throughout the length of the conveyor that have rotted and corroded. 2. The tail pulley guard is in fair condition. The tail pedestal and stringer are in poor condition with some corrosion. 3. The loading chute has a hopper to catch the coal from the head chute and still allow operation of the pivot feature of Conveyor Z. There are three 24"x24" homemade access doors with poor sealing. 4. The existing, rusted and corroded deck plate presents potential problems to the belt, tail pulley and belt support idlers. 5. Conveyor supports are in seriously corroded condition. Sections have been replaced.

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
				6. The skirt is worn and leaks. There is minimal rollback and considerable spillage around the skirt enclosure. There is considerable dribble from cleaners and snub pulley above. The seal allows dust and material to leak out. The existing dust curtain is missing. The existing tail seal does not properly conform to the belt profile and leaks. 7. There is a "V"-plow with a worn rubber blade to protect the tail pulley.
11	**Conveyor X**	4000 TPH, 72" wide, 700 fpm	Good Condition; Starting to deteriorate, but still reliable and does not have any significant down time.	1. The belt has some side edge damage, is in fair condition, and appears to track slightly to the left. There is considerable material build-up under the belt on the decking. 2. Material spillage has buried the tail pulley. The tail pulley guard is in poor condition and surrounded by material. The tail pedestal and stringer appear to be in good working condition. The EM stop guards and limit switches are in good condition. 3. The loading chute is in fair condition, but has a homemade inspection door with poor seals that leak. 4. The existing rusted and corroded deck plate presents potential problems to the belt, tail pulley and belt support idlers. 5. Conveyor supports are corroded. 6. The skirt enclosure is worn and leaks. There is considerable rollback and spillage around the skirt enclosure. The skirt seal is in poor condition, set about

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
				½" above the belt. The existing dust curtain is in poor condition. The existing tail seal does not properly conform to the belt profile and leaks. 7. There is no tail pulley protection such as a "V"-plow or diagonal plow.
12	**Conveyor G2**	4000 TPH, 72" wide, 650 fpm	Conveyor G2 is fed by a mobile reclaimer. It tends to be overfed, by the reclaimer, which causes slipping and some pluggage.	1. The belt has bad edges and cracks in the cover. It also appears to track poorly; direction of movement depends on direction of belt travel. 2. The tail pulley guard is in good condition. The tail pedestal and stringer are in poor condition with some corrosion. There are EM guards and limit switches in good condition. 3. There are no inspection doors in the loading chute and it is in fair condition. 4. The existing rusted and corroded deck plate presents potential problems to the belt, tail pulley and belt support idlers. 5. Conveyor supports are corroded and in poor condition. 6. The skirt enclosure is worn and leaks. There is considerable rollback and spillage around the skirt enclosure. The existing wear liner is worn. The skirt seal is slab rubber in poor condition and set about ½" above the belt. The seal allows dust and material to leak out. The existing dust curtain is missing. 7. There is no tail pulley protection such as a "V"-plow or diagonal plow.

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
13	**Conveyor J2**	4000 TPH, 72" wide, 668 fpm	Condition deteriorating; The belt scraper is thinning out as a result of the wet coal getting stuck between the belt and the beam. The walkways are in bad condition and are completely worn out.	1. The belt is in poor condition and has wearliner damage on cover. The belt splice is vulcanized and in fair condition. 2. The existing tail pulley is in fair condition. The zero speed switches appear to be functional. The guard is in fair condition. The tail pedestal and stringer are in fair condition with some corrosion. 3. There is corrosion in the loading chute, which allows material spillage and air to enter the transfer. 4. The existing rusted and corroded deck plate presents potential problems to the belt, tail pulley and belt support idlers. 5. Conveyor supports are in fair condition. 6. The worn skirt enclosure leaks material and dust. There is considerable rollback and spillage around the skirt enclosure. The Flex skirt seal is in poor condition and set about ¼" above the belt. The seal allows dust and material to leak out. The existing dust curtain is in poor condition. The existing tail box does not properly conform to the belt profile and leaks. 7. There is a worn rubber "V"-plow providing protection to the tail pulley.
14	**Conveyor Q1**	4000 TPH, 72" wide, 694 fpm	Relatively good condition and reliable.	1. The belt is in fair condition with bad edges and cracks in the covers. The belt splice is vulcanized and in fair condition. The belt appears to track to the left. 2. The existing tail pulley is in fair condition. There is a worn rubber "V"-plow providing protection. The zero

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
				speed switches appear to be functional. The tail pulley guard is in fair condition. The tail pedestal and stringer are in fair condition with some corrosion. 3. There are two (2) steel chutes loading Conveyor Q1 from the vibratory screen and they are in poor condition. 4. The existing, rusted and corroded deck plate presents potential problems to the belt, tail pulley and belt support idlers. 5. Conveyor supports are in poor condition. 6. The worn skirt enclosure leaks material and dust. There is considerable rollback and spillage around the skirt enclosure. The skirt enclosure covers have large open areas and are not properly sealed to prevent dust from escaping to the surrounding area. There is no wear liner in the skirt enclosure. The slab rubber skirt seal is in poor condition and set about ½" above the belt. The seal allows dust and material to leak out. There is no exit dust curtain. The existing tail box does not properly conform to the belt profile and leaks.
15	**Conveyor Q2**	4000 TPH, 72" wide, 694 fpm	Relatively good condition and reliable.	1. The belt is in fair condition with bad edges and cracks in the covers. The belt splice is vulcanized and in fair condition. The belt appears to track to the left. 2. The existing tail pulley is in fair condition. The guard is in poor condition. The tail pedestal and stringer are in fair condition with some corrosion. 3. There are two (2) load chutes loading to the Conveyor

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
				Q2 from the vibratory screen and they are in poor condition. 4. The existing rusted and corroded deck plate presents potential problems to the belt, tail pulley and belt support idlers. 5. Conveyor supports are in fair condition. 6. The worn skirt enclosure leaks material and dust. There is considerable rollback and spillage around the skirt enclosure. The skirt enclosure covers have large open areas and do not properly seal to prevent dust from escaping to the surrounding area. There is no wear liner in the skirt enclosure. The slab rubber skirt seal is in poor condition and set about ½" above the belt. The seal allows dust and material to leak out. There is no exit dust curtain. The existing tail box does not properly conform to the belt profile and leaks. 7. There is a worn rubber "V"-plow not properly set which is no longer providing protection to the tail pulley.
16	**Conveyor R1**	4000 TPH, 72" wide, 700 fpm	This is the tripper conveyor that feeds the blending bins; no reliability comments. Conveyor travel distance limits feeding bins 1 and 6.	1. The belt splice is vulcanized and in fair condition. The belt has bad edges. The belt appears to track to the right by 2". 2. The existing tail pulley is in good condition. The guard, tail pedestal and stringer are all in good condition. 3. The loading chute is corroded and has a ceramic lining that is in fair condition. There is one (1) inspection door with poor door hinges and seals.

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
				4. The existing rusted and corroded deck plate presents potential problems to the belt, tail pulley and belt support idlers. 5. Conveyor supports are in poor condition. 6. The worn skirt enclosure leaks material and dust. There is considerable rollback and spillage around the skirt enclosure. The Martin block skirt seal is in poor condition and set about ½" above the belt. The seal allows dust and material to leak out. The exit dust curtain is poor. A dust collection hood approximately with a 14" duct is installed. The tail box is poor with no seal. 7. There are two (2) "V"-plows installed with worn blades.
17	**Conveyor R2**	4000 TPH, 72" wide, 700 fpm	This is the tripper conveyor that feeds the blending bins; no reliability comments. Conveyor travel distance limits feeding bins 1 and 6.	1. The belt splice is vulcanized and in fair condition. The belt has bad edges. The belt appears to track to the right. 2. The existing tail pulley is in good condition. The guard, tail pedestal and stringer are all in good condition. 3. The loading chute is in fair condition and has a ceramic lining that is also in fair condition. There is one (1) inspection door with poor door hinges and seals. 4. The existing, rusted and corroded deck plate present potential problems to the belt, tail pulley and belt support idlers. 5. Conveyor supports are in poor condition. 6. The worn skirt enclosure leaks material and dust. There

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
				is considerable rollback and spillage around the skirt enclosure. The martin block skirt seal is in poor condition and set about ½" above the belt. The seal allows dust and material to leak out. The exit dust curtain is in poor condition. The tail box is also in poor condition with no seal. 7. There are two (2) "V"-plows installed with worn blades.
18	**Conveyor T1**	2000 TPH, 54" wide, 668 fpm	The conveyor does not have a lot of problems and is fairly reliable.	1. The splice is vulcanized and in good condition. The belt has severe top cover damage, allowing material entrapment in the gouged areas to carry back. The belt appears to wander, tracking to the right. 2. The horizontal take-up rails are severely corroded; this can lead to alignment problems with the take up carriage. 3. The existing tail pulley with horizontal take-up is in good condition. There are zero speed and limit switches in good condition. The tail pulley guard is in good condition. The tail pedestal and stringer have corrosion. 4. Each feeder beneath the blending hoppers has one (1) load chute. Some corrosion was detected in the chutework and AR linings. 5. Conveyor supports are in good condition. 6. The skirtboards from the weigh feeder discharge chutes appear worn. There is minimal rollback and considerable spillage around the skirt enclosure. The

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
				Martin block skirt seal is in poor condition and set about ½" above the belt. There are multiple sections of blocks missing from the system. The seal allows dust and material to leak out. The exit dust curtain is in poor condition. The tail seal does not seal properly. 7. There is a single Martin rubber "V"-plow with a worn blade.
19	**Conveyor T2**	2000 TPH, 54" wide, 669 fpm	The conveyor does not have a lot of problems and is fairly reliable.	1. The belt splice is vulcanized and in good condition. The belt has severe top cover damage allowing material entrapment in the gouged areas to carry back. Additionally, it appears to wander, tracking to the right. 2. The slide take-up rails are severely corroded, which can lead to alignment problems with the take-up carriage. 3. The existing tail pulley with horizontal take-up is in good condition. There are zero speed and limit switches in good condition. The tail pulley guard is in good condition. The tail pedestal and stringer have corrosion. 4. Each feeder beneath the blending hoppers has one (1) load chute. Some corrosion was detected in the chutework and AR linings. The existing dribble hoppers under each feeder that allow carry back to fall into the skirt enclosure below and have several areas where access panels have been removed. 5. Conveyor supports are in good condition. 6. The skirtboards from the weigh feeders discharge

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
				chutes appear worn. There is minimal rollback and considerable spillage around the skirt enclosure. There is no wear liner installed in the skirt enclosure. The Martin block skirt seal is in poor condition and set about ½" above the belt. There are multiple sections of blocks missing from the system. The seal allows dust and material to leak out. The exit dust curtain is in poor condition. The tail seal does not seal properly. 7. There is a single Martin rubber "V"-plow with a worn blade.
20	**Truck Load-Out Conveyor**	1600 TPH, 54" wide, 668 fpm	No reported problems.	1. The belt splice is vulcanized and in good condition. The belt has rough edges, but appears to track properly. 2. The existing tail pulley is in good condition. There are zero speed and limit switches in good condition. The guard is in good condition. The tail pedestal and stringer are also in good condition. 3. There are two loading chutes that are corroded and have AR linings that are in fair condition. 4. The rubber impact idlers, in the loading area, have uneven wear, thus track the belt incorrectly. 5. The skirt enclosure is worn and leaks material and dust. There is rollback and spillage around the skirt enclosure. The existing skirt walls are 1" off the belt line. There is an existing straight wear liner installed 2" above the belt the entire length of the skirt enclosure. The skirt seal is in poor condition and set about ½" above the belt. The seal allows dust and

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
				material to leak out. The exit dust curtain is in poor condition. The tail seal does not seal properly. 6. There is a single rubber "V"-plow with a worn blade.
21	**Conveyor W1**	1800 TPH, 54" wide, 460 fpm	Dust from the crusher builds up under W1 and W2. There is not much clearance under W1 and W2 so the area has to be cleaned constantly.	1. The belt splice is vulcanized and in good condition. The belt has rough edges and appears to wander to the right and left. 2. At the tail pulley, the zero speed switches appear to be in good working condition, the guard is in good condition, and the tail pedestal and stringer are corroded. 3. In the discharge chute there are homemade access doors with poor sealing, otherwise, the chutes are in fair condition. 4. The existing rusted and corroded deck plate presents potential problems to the belt, tail pulley and belt support idlers. 5. Conveyor supports are in fair condition. 6. The skirt enclosure is worn and leaks. There is minimal rollback and spillage around the skirt enclosure. The skirt seal is slab rubber in poor condition and set about ½" above the belt. The seal allows dust and material to leak out. The existing dust curtain is in poor condition. The existing tail box does not properly conform to the belt profile and leaks. 7. There are two (2) Martin rubber "V"-plows with worn blades.

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
22	**Conveyor W2**	1800 TPH, 54" wide, 460 fpm, 150 HP	Same Comment as Item 22, Conveyor W1	1. Same Observations as Item 22, Conveyor W1
23	**Conveyor U**	2000 TPH, 54" wide, 668 fpm	Conveyor U was designed to be an emergency discharge conveyor, but is not being used much.	1. The belt splice is vulcanized and in fair condition. The belt has wear liner damage. The belt appears to track to the right. 2. At the tail pulley, the zero speed switch and alignment limit switch appear to be in good working condition. The tail pulley guard is in good condition, as well as, the tail pedestal and stringer. 3. The discharge chute is has two (2) diverter gates and is lined with ceramic liners. There are homemade access doors with poor sealing, otherwise, the chutes are in fair condition. 4. Conveyor supports are in good condition. 5. The skirt enclosure is worn and leaks. There is minimal rollback and spillage around the skirt enclosure. There is no existing wear liner in the skirt enclosure. There is no seal on the skirt enclosure. The missing skirt seals allow dust and material to leak out. The skirt dust curtain is missing. The existing tail box does not properly conform to the belt profile and leaks. There is one (1) abandoned dust collection hood between the two (2) load points and one (1) after the load zones. 6. There is a single Martin rubber "V"-plow with a worn belt.

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
24	**Conveyor L1**	2000 TPH, 54" wide, 668 fpm	Conveyor L1 has been relatively good. The belly pan has holes from rust and they can't run water down it to clean it up. It had some tracking problems which caused a fire, but those problems have been resolved.	1. The belt splice is vulcanized and in good condition. The belt appears to track properly. 2. At the tail pulley, the zero speed switches appear to be in good working condition, but the alignment limit switch appears to be missing and the tail pulley guard is in good condition. The tail pedestal and stringer are in good condition. 3. The loading chute to Conveyor L1 has a vibratory grizzly which is being used as a stationary grizzly only. The motor is disconnected. This chute is in fair condition. 4. Conveyor supports are in good condition. 5. The skirt enclosure is worn and leaks. There is minimal rollback and spillage around the skirt enclosure. The slab rubber skirt seal on the skirt enclosure is ¼" off the belt and leaks. The skirt dust curtain is in poor condition. 6. There is no tail pulley protection such as a "V"-plow or diagonal plow.
25	**Conveyor L2**	2000 TPH, 54" wide, 668 fpm	Same comments as Item 24, Conveyor L1, even the fire in the past.	1. Same Observations as Item 25, Conveyor L2.
26	**Belt Feeders K1A, K1B, K2A, and K2B**	1000 TPH, 54" wide	They are used for any kind of by-products, one (1) per each of four (4) hoppers.	1. Due to infrequent use, all conveyor components are in good condition.
27	**Conveyor M1**	2000 TPH, 60" wide, 668 fpm	No reported problems.	1. The belt splice is vulcanized and in good condition. The belt has rough edges, but appears to track straight.

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
				2. At the tail pulley, the zero speed switch and alignment limit switch appear to be in good working condition. The tail pulley guard, the tail pedestal and stringer are all in good condition. 3. On the loading chute, there are two homemade access doors missing seals, otherwise, these chutes are in fair condition. 4. The existing rusted and corroded deck plate presents potential problems to the belt, tail pulley and belt support idlers. 5. Conveyor supports are in fair condition. 6. The skirt enclosure is worn and leaks. There is considerable rollback and spillage around the skirt enclosure. The slab rubber skirt seal on the skirt enclosure is ½" of the belt and leaks. The skirt dust curtain is in poor condition. The existing tail box does not seal properly to the belt. 7. There is a single Martin rubber "V"-plow with worn blade.
28	**Conveyor M2**	2000 TPH, 60" wide, 668 fpm	No reported problems.	1. Same Observations as Item 27, Conveyor M1.
29	**North Stacker & Tripper Conveyor**		Many problems and not that reliable. General consensus among TECO yard personnel is that it should be replaced with something similar to the South Stacker.	1. The support carriage for the tripper conveyor is in very poor structural condition. 2. Problems with the diverter gate operation. 3. Many of the 18" I-Beams are rusted through. 4. The operator's cab is in poor condition. 5. Considerable spillage on the tripper car.

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
30	**South Stacker / Reclaimer**	4000 TPH	More reliable than the North Stacker, but it still has several problems. Many of the alarms have been removed to keep the machine running without addressing the problems. Does not meet the rated 4000 tph capacity requirements. General access to the chutes and load zones in restricted.	1. It has tracking problems. 2. Chutes are getting plugged. 3. There is a lot of spillage around the machine. 4. There are a lot of safety alarms missing. 5. Walkway access is in poor condition. 6. Overall lighting is poor.
31	**Crusher**		It appears the crusher is not being used to get a fine mesh, as designed. As a result, dusting and pluggage occurs within the crushing system.	
32	**Vibrating Screens (after Conveyors J1 and J2)**		The vibrating feature is not being used by plant personnel for fear that the structure might be compromised by the vibrating equipment. The discharge area shows significant signs of wear.	
33	**Grizzlies (above the K-**		No reported problems.	

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
	Belt Feeders)			
34	**Magnetic Separator (at the head end of Conveyor P)**		Works well when running.	
35	**Scales**		The general consensus is that the system scales are not accurate. Plant personnel would like to see improved accuracy and a read-out in the control room for all scales.	
36	**Blending Bins**		The blending bin drawings have not been updated. The walls and bottoms have holes. Another problem is that blending bins 1 and 6 don't fill completely because of the tripper conveyor travel.	1. The wall between bins 1 and 2 has worn out and there is a large hole. 2. There is also wear between bins 4, 5, and 6. 3. There is no North-South partition wall separating the east and west bin pairs. Because of this, the collecting conveyors T1 and T2 can reclaim material from either bin chamber. 4. Conveyors Q1 and Q2 load onto tripper belt conveyors R1 and R2. There was a considerable amount of coal dust on level surfaces throughout the tripper galley. 5. Access is good to both sides of both conveyors.
37	**Transfer Tower T2**		This structure has a lot of electrical problems (broken conduit and 110 V feed to	1. This is an open structure; the equipment and transfer are exposed to the weather elements. 2. There was considerable spillage around the tail end of

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
			the I/O shorts out)	the conveyors.
38	**Transfer Tower T3**		The chute from Conveyor F1 plugs. It is reported that there are exposed electrical boxes which require replacement, refurbishing, or closing. Open boxes can present the plant with potential hazardous conditions.	1. This is an open structure; the equipment and transfer are exposed to the weather elements. 2. There was considerable spillage around the tail of Conveyor J1. 3. Access to the chute and load zone is restricted. 4. Electrical equipment is in poor condition. 5. Some structural members are rusted through and the hoist/trolley structural steel is in poor condition.
39	**Transfer Tower T4**		The T4 structure and equipment in the tower have excessive wear.	1. This is an open structure; the equipment and transfer are exposed to the weather elements. 2. Conveyor Z loads onto Conveyor P. There is considerable carry back and material spillage at the base of the transfer, and dust throughout the area. 3. Conveyor Z loads a hopper at the top of the transfer structure. An open area allows air to enter the chute and dust to escape from the chute. 4. The structure frame restricts access to the chute and load zone. 5. There is limited access to the skirt enclosure.
40	**Transfer Tower T5**		The T5 structure has access problems and the chutes to conveyors Q1 and Q2 have very bad deterioration.	1. This is an open structure; the equipment and transfer are exposed to the weather elements. 2. Conveyor P load onto Conveyor J2. There was considerable spillage around the tail of Conveyor J2. 3. Access to the chute and load zone is restricted.

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
41	**Screen House T6**		The TECO opinion is that the structure needs to be replaced and the TECO maintenance crew has been trying to get the funding to replace it. There are reports of plant personnel using washdown water, to clean away the heavy coal spillage, in and around areas where there is open/broken electrical equipment. Open boxes can present the plant with potential hazardous conditions	1. This is an open structure; the equipment and transfer are exposed to the weather elements. 2. Conveyors J1 and J2 are loading onto Conveyors Q1 and Q2. There is considerable spillage throughout the structure. 3. Access to the screens, chutes and load zones is restricted. 4. A lot of the electrical equipment is buried by coal and most of the conduit is broken.
42	**Continuous Barge Unloader – Ladder Unloader**		The Dravo unloader is old and outdated. TECO opinion is that it would be more economical to get another clam shell unloader to replace it. The Dravo unloader creates a lot of spillage when unloading. It isn't used to unload coke for fear that too much material will spill into the Bay. The gearbox and leg bolts need to	

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
			be replaced. The Dravo unloader is structurally in poor condition and in a similar state as most of the coal yard equipment.	
43	**PECO Barge Unloader – Clam Shell**		It is reported that the pneumatic rail clamps of the PECO machine should be updated or replaced with safety being a main concern. Also, reports indicate that the PECO machine bucket is undersized and needs replacement. The cab and boom travel need to be evaluated, as well, because of travel limitations. The trolley rail (the boom on the PECO), also needs a major overhaul.	
44	**Self Unloader Hopper**		There is one self unloading hopper that feeds Conveyor A. All three unloading machines (Dravo, PECO, and self unloader) unload into the self unloader hopper. There are no significant	

ITEM	CONVEYOR / EQUIPMENT / STRUCTURE NAME	CONVEYOR CAPCACITY / BELT WIDTH / FPM	RESULTS OF INTERVIEW	OBSERVATION / PROBLEM
			problems.	
45	**Rail System**		Both the Dravo and PECO unloaders are on the same rail system. TECO consensus is that this rail system needs to be refurbished or replaced.	

ATTACHMENT B

AIR CONTROL SCIENCE REPORT

EXECUTIVE SUMMARY, PRIORTY LIST AND

INTRODUCTION SECTION

1.0 EXECUTIVE SUMMARY

This report is an evaluation of the TECO Tampa Electric Big Bend Generating Station material handling, dust control and fire protection systems. This report puts forth a detailed evaluation of the stations current conditions as well as a recommended program to improve those conditions. Implementation of the recommended program will significantly improve the efficiency, health and life safety, and work environment at the station. In addition, implementation will greatly reduce the likelihood of a catastrophic accident at the station.

The budgetary cost estimate (+/- 35%) to execute the recommended program is $23,537,000. This figure includes engineering, procurement, demolition, construction, construction management, and startup testing. ACS has based the cost estimates on a single, unrestricted, extended outage.

A summary of the findings contained herein follows:

Conveying Systems

ACS has evaluated each conveyor, conveyor transfer point, load zone, and enclosure. In virtually all cases, sealing and containment was inadequate to control dust-laden airflow. Implementation of the recommended program will rectify these inadequacies.

Dust Collection

ACS has evaluated each transfer point and dust generating source in regards to passive technology, active dust collection and suppression. Recommendations are a result of weighing dust control effectiveness with economic considerations. At most transfer points, a combination of discrete element modeling (DEM) transfer chutes and active dust collection is the most practical option for effective dust control. In several areas, DEM transfer chutes, in conjunction with Dustless Transfer® system recirculation chambers, are the most practical option.

Dust Suppression

ACS has evaluated each transfer point and dust generating source in regards to passive technology, active dust collection and suppression. Recommendations are a result of weighing dust control effectiveness with economic considerations. At most transfer points dust can be controlled through passive or active measures, and therefore suppressions are not required.

ACS guarantees dust levels below 2 mg/m^3 over an eight (8) hour time weighted average upon completion of the entire recommended scope within this report, in all the areas included in the prioritized list above, with the exception of the barge unload dock and tower, stockout towers and piles.

Air Control Science® Inc (ACS) has evaluated the potential risks of a catastrophic event occurring in each area analyzed, including the costs of lost generating capacity, and equipment repair or replacement. Based on this analysis, ACS generated the risk-based priority list below, with number 1 being the highest priority:

1. Barge Unload Dock $1,582,000
2. Blending Bins $5,113,000
3. Plant Bunkers $1,975,000
4. Transfer Structure T1 ..... $347,000
5. Transfer Structure T2 ..... $2,043,000
6. Transfer Structure T3 ..... $351,000
7. Transfer Structure T4 ..... $485,000
8. Transfer Structure T5 ..... $439,000
9. Screen House T6 ..... $1,036,000
10. Crusher Structure T7 ..... $2,178,000
11. Transfer Structure T8 ..... $1,909,000
12. Stacker Reclaimer $1,329,000
13. North Stacker $1,541,000
14. Truck Load-Out $758,000
15. FGD Gypsum Belt Loading $626,000
16. FGD Gypsum Stackout $187,000
17. FGD Gypsum Manatee Structure $124,000
18. FGD Gypsum South Structure $125,000
19. FGD Gypsum Fines Stackout $320,000
20. FGD Limestone Storage Bins $355,000
21. FGD Limestone Truck Dump $399,000
22. FGD Limestone Large Transfer Structure $196,000
23. FGD Limestone Small Transfer Structure $119,000
24. FGD Storage Building ..... Not in Scope

This list can be a valuable tool in making capital appropriation decisions. The budgetary cost breakdown by area is for accounting purposes only. The figures are not intended to be stand-alone projects.

2.0 INTRODUCTION

TECO Tampa Electric contracted with ACS to perform a Phase I Engineering Evaluation of the material handling and dust control systems at the Big Bend Generating Station.

ACS is an engineering, procurement and construction company focused on providing the best-engineered solutions for a client's material handling, dust control and fire protection. ACS does not manufacture any equipment or represent any manufacturers, so it can objectively specify the best available technology. This report is Phase I of a three-phase design process. ACS can provide services for any or all of the three major project phases (i.e. feasibility/conceptual engineering, basic/design engineering, and detail engineering, procurement and construction) depending upon client needs.

The general scope of this report is to evaluate current dust control methods and to recommend improvements to achieve more effective control of fugitive dust and material. Recommendations for material containment are found in the evaluations of individual systems such as conveyors, screens, feeders, and transfer points as defined in more detail in the Area Assessment section of this report. The System Assessment section of this report details specific dust collector recommendations. Material containment combined with dust control measures provide the effective means of dust control; in addition, adequate fire protection reduces the health and safety risks.

Recommendations within this report address modification of existing equipment/enclosures, application of passive dust control measures, installation of new or reuse of existing dust collection equipment, ductwork, suppression systems, fire protection systems, and modification of transfer point seals, skirting, belt cleaning systems and chutes. **As practical, the ACS goal is to make the best use of the existing equipment before considering extensive capital upgrades.**

The recommendations contained within this report constitute a program which will greatly reduce dusting and material spillage at the station. Implementation of this program will greatly reduce the risk of a catastrophic explosion at the station.

Conclusions and recommendations presented in this report are the result of observations and discussions with TECO Tampa Electric engineering, maintenance and operating personnel, and a review of drawings, specifications and other documents provided by TECO Tampa Electric.

Fugitive dust emissions from coal handling operations result primarily from the following:

- Leaks in material handling containment enclosures in the load zone of conveyors (Dust escapes the load zone due to lack of support under the belt, as well as skirt boards and rubber seals that do not adequately contain the material.)

- Lack of enclosures, enclosure covers, or insufficient enclosure volume at transfer points
- Dust from carry back on conveyor belts
- Improper size and placement of collection hoods
- Lack of air collection to adequately control dust generated by induced airflow of falling material

To provide complete fugitive dust control and a safe facility in all areas in question, ACS recommends the following:

- Provide material handling modifications to maintain a dust-tight seal between the belt and skirt sealing system. Apply current belt cleaning technology to minimize carry back on the return belts. Install tail boxes with effective tail seals. Upgrade belt support systems. Wear liner must be installed to proper tolerance to keep material inside the skirt walls. Install multiple lipped, self-adjusting skirt seals to adequately seal between the conveyor skirt enclosure and the belt. Multiple, recessed dust curtains trimmed to the profile of the material belt must be included inside each skirt enclosure. To be most effective, address material containment problems before implementing any recommended dust control and collection measures.
- Seal head chutes to restrict airflow into transfer chutes.
- Enlarge the conveyor skirt enclosures (height and length recommended herein) to reduce the induced air velocity through the enclosure, allow stilling of the airborne dust, and better accommodate system surges. Cover and seal all skirt enclosures. Install dust-tight maintenance access doors; such doors must utilize gaskets and locking mechanisms to stay airtight. Existing access doors should have new gaskets installed for proper sealing.
- Install new dust collection systems where indicated, retire existing ducting systems and implement passive control designs to control dust emissions.

Typical drawings reflecting the above items are located in Exhibit 7 – ACS Standard Drawings of this report.

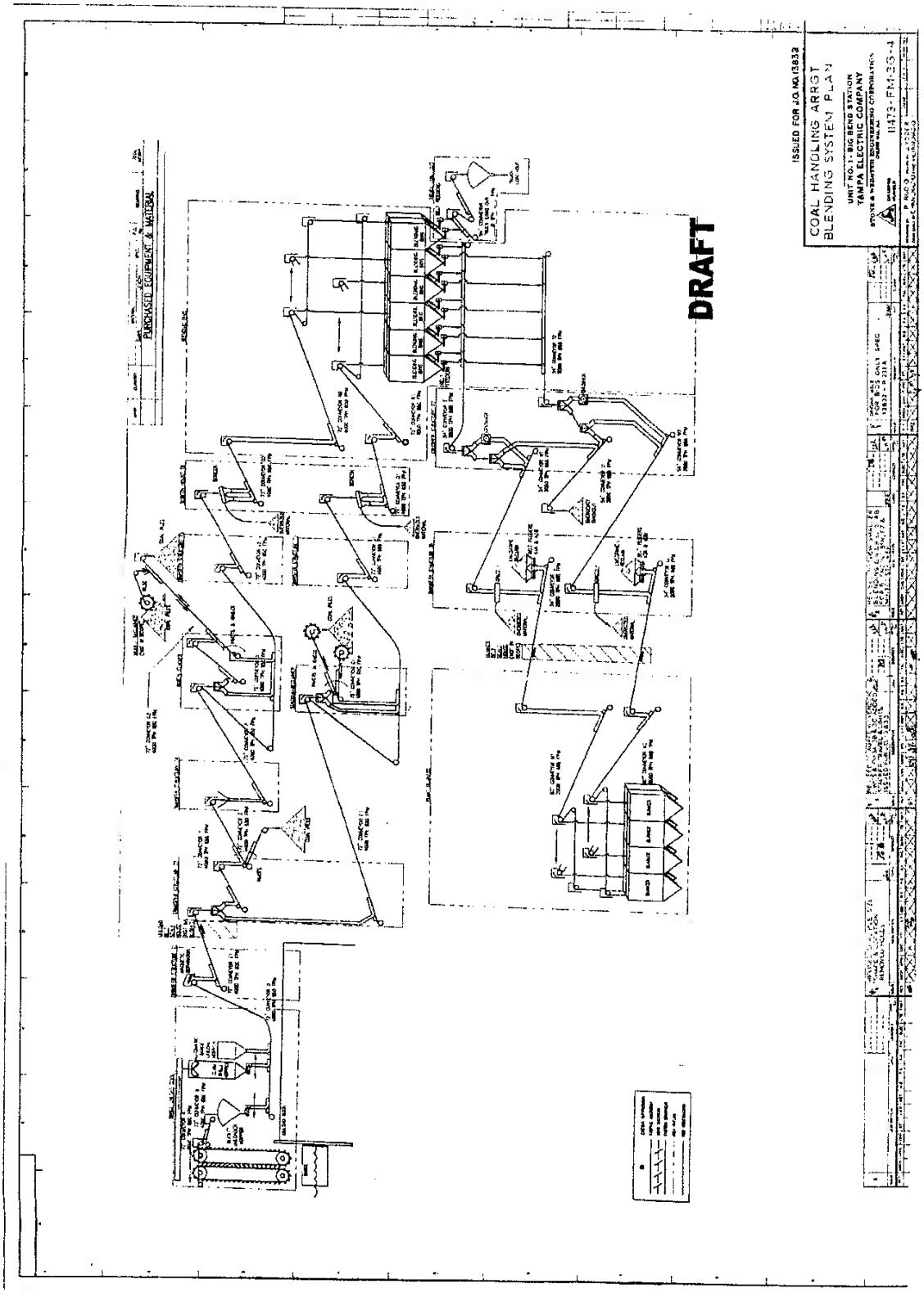
Evaluation and recommendations for each area and dust control system of the TECO Tampa Electric Big Bend Generating Station coal handling operations are located in Section 3.0 Area Assessment and Section 4.0 System Assessment of this report. The process flow diagrams in Exhibit 1 – Flow Diagram illustrate the recommendations.

ATTACHMENT C

REFERENCE DRAWINGS

REFERENCE DRAWINGS

WGI Drawing No.	TECO Drawing No.	Rev.	Date	Title
	11473-FM-3G-4	4		Coal Handling Arrgt. Blending System Plan
	11473-FM-3G-4	DRAFT		Flow Diagram – Coal Handling Arrgt.


DRAFT
COAL HANDLING ARRGT
BLENDING SYSTEM PLAN
ISSUED FOR JOB NO. 13832
PURCHASED EQUIPMENT & MATERIAL

TAMPA ELECTRIC COMPANY
DOCKET NO. 130040-EI
HUA'S THIRD REQUEST FOR PODS
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