

LM6000, 710-3228
LM2500T 710-3299
FT4 710-3300

EDC II

EQUIPMENT PURCHASE AGREEMENT

between

Energy Parts Solutions, LLC

and

Derwick Associates, Corp.

20% up front

March 8, 2010

EQUIPMENT PURCHASE AGREEMENT

This Equipment Purchase Agreement (the "Agreement") is made effective as of the 8 day of February 2010 (the "Effective Date"), between **ENERGY PARTS SOLUTIONS, LLC**, a Missouri company ("Seller"), and **DERWICK ASSOCIATES, Corp.**, a Barbados company ("Buyer").

3 SF
1 DAY

RECITALS

Buyer desires to purchase two (2) new GE LM2500+ 60 Hz gas turbine generator sets, four (4) New or refurbished GE LM6000 60 Hz gas turbine generator sets, and two (2) previously operated and refurbished Pratt & Whitney Power Pac FT-4A-9 60 Hz gas turbine generator sets, as further described in Exhibit A (each gas turbine generator set sometimes referred to as a "Unit" and collectively referred to as the "Equipment").

Seller desires to sell the Equipment to Buyer.

The parties further agree that once they have executed this Agreement that they will immediately commence negotiations and execute one or more agreements whereby Seller and/or one of its affiliates or subsidiaries will install, startup and commission the Equipment in Venezuela all on a fast-track basis.

FOR AND IN CONSIDERATION of the mutual covenants herein contained and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged and agreed, the parties agree as follows:

1. PURCHASE AND SALE OF EQUIPMENT

Upon the terms and subject to the conditions contained herein, Seller shall sell to Buyer, and Buyer shall purchase from Seller, the Equipment.

2. PURCHASE PRICE; PAYMENT TERMS

2.1 Purchase Price

The purchase price for the Units is as follows:

U.S.\$16,100,000 for each of the two (2) GE LM2500+ Units for a total of U.S.\$32,200,000
U.S.\$17,000,000 for each of the four (4) GE LM6000 Units for a total of U.S.\$68,000,000
U.S.\$8,625,000 for each of the two (2) P&W FT4 Units for a total of U.S.\$17,250,000

The total purchase price for all the Equipment is a total of U.S.\$117,450,000

(the "Purchase Price").

2.2 Payment Terms

2.2.1 On or before two (2) days from the Effective Date the Buyer shall wire to Seller in immediately available funds a non-refundable downpayment of U.S.\$16,100,000 for the GE LM2500+ Units.

2.2.2 On or before two (2) days from the Effective Date the Buyer shall wire to Seller in immediately available funds a non-refundable downpayment of U.S.\$20,400,000 for the GE LM6000 Units.

- 2.2.3 On or before two (2) days from the Effective Date the Buyer shall wire to Seller in immediately available funds a non-refundable downpayment of U.S.\$8,625,000 for the P&W FT4Units.
- 2.2.4 On or before fifteen (15) days from the Effective Date the Buyer shall wire to Seller in immediately available funds U.S.\$37,400,000 for the GE LM6000 Units.
- 2.2.5 On or before Seller's written notice of readiness to ship the GE LM2500+ Units the Buyer shall wire to Seller in immediately available funds the final payment of U.S.\$16,100,000 for the GE LM2500+ Units.
- 2.2.6 On or before Seller's written notice of readiness to ship the GE LM6000 Units the Buyer shall wire to Seller in immediately available funds the final payment of U.S.\$10,200,000 for the GE LM6000 Units.
- 2.2.7 On or before Seller's written notice of readiness to ship the P&W FT4 Units the Buyer shall wire to Seller in immediately available funds the final payment of U.S.\$8,625,000 for the P&W FT4 Units.

All funds wired to Seller shall be sent according to the following instructions:

US Bank
3615 W Broadway Blvd
Sedalia, MO 65301
Routing Number: 081000210
Account Number: 152307883347
SWIFT Code is: USBKUS44IMT (that is an 'i' and not a 'l')

If the downpayment of the Purchase Price for the GE LM2500+ Units, GE LM6000 Units or P&W FT4 Units is not paid to Seller within two (2) days from the Effective Date then Seller may terminate this Agreement in whole or in part without further obligation or liability. In the case where any payment is delayed and one or more Units are no longer available for sale then, at the option of Seller, said Unit(s) may be excluded from the sale hereunder and the total Purchase Price for the Equipment will be reduced by the Purchase Price for said Unit(s).

3. ASSUMPTION OF LIABILITIES; REMOVAL AND TRANSPORTING OF EQUIPMENT; TITLE AND RISK OF LOSS

3.1 Assumption of Liabilities

Upon payment of the full amount of the Purchase Price for a Unit the Buyer shall assume and agree to pay, perform and discharge when due all liabilities arising out of, in connection with, or related to the ownership, storage, removal, operation, use, or maintenance of the Unit relating to periods on or after said date.

3.2 Removal and Transporting of Equipment

After Seller's receipt of the Purchase Price for a Unit, the Seller agrees to assist Buyer and its representatives in gaining access to the Unit where it is stored or located so that Buyer can remove and transport the Unit. Buyer will at all times while at the storage facility abide by the applicable safety rules and regulations. Buyer will work closely with Seller's and its representative's and agent's personnel to ensure that Buyer's activities shall not interfere with any other activities on-going at the facilities. Buyer shall be responsible for all storage charges for the Unit after the date of Seller's receipt of the Purchase

Price for the Unit. In the event Buyer retains Seller to crate, remove and transport the Unit from its present location, then Seller will agree to do so at cost plus 15% and the Parties will execute a separate Purchase Order for said the additional work which will include a mutually agreeable advance of funds so that Seller can mobilize and commence the work.

3.3 Title and Risk of Loss

Title and risk of loss in and to a Unit shall transfer from Seller to Buyer upon Seller's notice of readiness to ship the Unit from its present location; provided, however, if Buyer engages Seller to handle the storage, crating, removal and transporting of the Unit under a separate agreement or purchase order then risk of loss in and to the Unit shall transfer to Buyer upon discharge of Seller's obligations to transport under said separate agreement or purchase order.

4. WARRANTY

4.1 Seller hereby represents and warrants to Buyer that:

- (a) Seller shall have full legal and beneficial title to the Equipment, free and clear of any and all security interests, liens, claims, charges or encumbrances of any nature whatsoever, together with full power and lawful authority to deliver the Equipment to Buyer; and Seller shall transfer good and marketable title to the Equipment to Buyer on or before the date the Equipment is ready to be transported from its present location.
- (b) Seller is an entity duly organized, validly existing and in good standing under the laws of the jurisdiction in which it is formed and has the requisite power and authority to own, lease and operate its properties and to carry on its business as now conducted. Seller is duly qualified to transact business and is in good standing in each jurisdiction in which its ownership of the Equipment and commitments made hereunder makes such qualification necessary.
- (c) Seller has the requisite power and authority to execute this Agreement and to consummate the transactions contemplated by this Agreement. The execution and delivery of this Agreement by Seller and the consummation by Seller of the transactions contemplated by this Agreement have been duly authorized by all necessary action on the part of Seller. This Agreement has been duly executed and delivered by Seller and, assuming due execution and delivery by Buyer, constitutes a valid and binding obligation of Seller, enforceable against Seller in accordance with its terms.
- (d) The execution and delivery by Seller of this Agreement and the consummation of the transactions contemplated hereby do not and will not (i) violate any provision of the constituent documents of Seller, (ii) violate any order of any governmental authority to which Seller is bound or subject, (iii) violate any applicable law, or (iv) result in the imposition or creation of any lien upon the Equipment.
- (e) No order or permit issued by, or declaration or filing with, or notification to, or waiver from any governmental authority is required on the part of Seller in connection with the execution and delivery of this Agreement, or the compliance or performance by Seller with any provision contained in this Agreement.
- (f) There is no legal action or order pending or overtly threatened against Seller that seeks to restrain or prohibit or otherwise challenge the consummation, legality or validity of the transactions contemplated hereby.
- (g) Seller is, with respect to the Equipment and this Agreement, in compliance with all applicable laws.

- (h) There are no defects in material and workmanship in a Unit for a period of twelve (12) months from the installation of the Unit at Buyer's or its customer's site or eighteen (18) months from the date of Seller's receipt of the Purchase Price for the Unit, whichever occurs first. In the event of a warranted defect in the Unit occurs during the warranty term and Buyer so notifies Seller within said period, Seller shall correct such defect by either repair or making available a repaired or replacement Unit, or part thereof, at Seller's place of repair/replacement. Buyer shall be responsible for removing, transporting and installing any defective or repaired/replaced Unit or part thereof. The terms set forth in this Section 4.1(h) sets forth the exclusive remedies for all claims based on failure of or defect in the Equipment provided under this Agreement whether the failure arises before, during or after the warranty period and whether said claim is based on contract, indemnity, warranty, tort (including negligence), strict liability or otherwise. The duties of Seller under this Section 4.1(h) do not extend to any repairs, adjustments, alterations, replacements or maintenance that may be required as a result of normal wear and tear in the operation of the Equipment, normal degradation in the performance of the Equipment, or as a result of (i) improper repair or alteration by Buyer or any other person (other than Seller or its affiliates), (ii) misuse, negligence or damage by Buyer or any other person (other than Seller or its affiliates), (iii) misuse, negligence or damage by Buyer or other persons, (iv) excessive operation at peak capacity, frequent starting, type of fuel, detrimental air inlet conditions, or erosion, corrosion or material deposit of fluids. The warranty and remedies are further conditioned upon (a) the proper storage, installation, operation and maintenance of the equipment and conformance with the operation and instruction manuals provided by the suppliers and manufacturers, (b) repair or modification pursuant to the instructions of the suppliers and manufacturers and as otherwise directed by Seller, and (c) either (y) installation, startup and commissioning of the Equipment will be performed by Seller or one of its affiliates under separate agreement or (z) on-site supervisory services for the installation, startup and commissioning of the Equipment will be performed by Seller or one of its affiliates under separate agreement. **SELLER HEREBY DISCLAIMS ANY OTHER WARRANTY EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE AS TO THE EQUIPMENT.**

4.2 Buyer hereby represents and warrants to Seller that:

- (a) Buyer is an entity duly organized, validly existing and in good standing under the laws of the jurisdiction in which it is formed and has the requisite power and authority to own, lease and operate its properties and to carry on its business as now conducted. Buyer is duly qualified to transact business and is in good standing in each jurisdiction in which its commitments hereunder makes such qualification necessary.
- (b) Buyer has the requisite power and authority to execute this Agreement and to consummate the transactions contemplated by this Agreement. The execution and delivery of this Agreement by Buyer and the consummation by Buyer of the transactions contemplated by this Agreement have been duly authorized by all necessary action on the part of Buyer. This Agreement has been duly executed and delivered by Buyer and, assuming due execution and delivery by Seller, constitutes a valid and binding obligation of Buyer, enforceable against Buyer in accordance with its terms.
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- (c) The execution and delivery by Buyer of this Agreement and the consummation of the transactions contemplated hereby do not and will not (i) violate any provision of the constituent documents of Buyer, (ii) violate any order of any governmental authority to which Buyer is bound or subject, or (iii) violate any applicable law.
- (d) No order or permit issued by, or declaration or filing with, or notification to, or waiver from any governmental authority is required on the part of Buyer in connection with the execution and

delivery of this Agreement, or the compliance or performance by Buyer with any provision contained in this Agreement.

- (e) There is no legal action or order pending or overtly threatened against Buyer that seeks to restrain or prohibit or otherwise challenge the consummation, legality or validity of the transactions contemplated hereby.
- (f) The execution and delivery by Buyer of this Agreement and the consummation of the transactions contemplated hereby or any subsequent transaction involving the resale of the Equipment do not violate the U.S. Foreign Corrupt Practices Act, and in connection therewith, Buyer agrees not to directly or indirectly receive, authorize, make, or promise to make any offer, payment, or gift of anything of value that would violate the laws of the United States of America or the laws of Venezuela to or for the use or benefit of (a) any official, candidate for political office, or employee of any agency or instrumentality of any government, political party, public international organization, or any other person, or (b) any person, while knowing that all or a portion of such money or thing of value will be directly or indirectly offered, given, or promised to any official, candidate for political office, or employee of any agency or instrumentality of any government, political party, public international organization, or any other person.

5. INDEMNIFICATION

Buyer assumes liability for, and hereby agrees to indemnify, protect, save and keep harmless Seller and its directors, officers, and employees from and against any and all liabilities, obligations, losses, damages, penalties, claims (including, without limitation, claims involving strict or absolute liability in tort), actions, suits, costs, expenses and disbursements, including, without limitation, reasonable attorney's fees and expenses, of any kind or nature, which may be imposed on, incurred by or asserted against Seller arising out of and in connection with (i) Buyer's obligations under this Agreement, (ii) acceptance, ownership, delivery, possession, use, operations, maintenance, repair, function, registration, sales, return, storage, or other disposition of the Equipment or any accident in connection therewith after the transfer of the title of the Equipment to Buyer on the date of Seller's receipt of the Purchase Price (except for defects in the equipment, latent or otherwise), or (iii) the negligence of Buyer, its employees, representative, contractors and agents.

6. TAXES

Buyer shall be responsible for and shall pay when due any and all taxes, duties, fees or other charges (including ad valorem, consumption, excise, franchise, gross receipts, import, license, property, sales, stamp, use or value added taxes) imposed by any governmental authority which relate to the transactions under this Agreement. Upon request, either party agrees to furnish to the other evidence of any applicable tax or duty exemption acceptable to the taxing or customs authorities. In the event Buyer is obligated by law to deduct or otherwise withhold from the amounts due to Seller under this Agreement any taxes, duties or other charges for which it is responsible, then it agrees to pay such additional amounts to Seller to equal the full amount for which Seller is entitled and shall provide Seller with accurate official receipts from the appropriate governmental authority for the deducted or withheld amounts.

7. DEFAULT; REMEDIES

7.1 Events of Default

If any one of more of the following events of default (herein "Event of Default") shall happen, then this Agreement may at the option of the party not in default be terminated:

(a) If either party shall default in the due and punctual payment of any sum due to the other which default shall not be cured within five (5) business days after written notice of default to the defaulting party; provided, however, no notice and cure period shall apply with respect to any payments of the Purchase Price under Section 2.2;

(b) If either party shall default in the performance of any of the material provisions contained in the Agreement, which default shall continue for five (5) business days after written notice of default to the defaulting party; or

(c) If any representation or warranty made by either party herein or made in any statement or certificate furnished or required hereunder, or in connection with the execution and delivery of this Agreement, proves untrue in any material respect as of the date of issuance or making hereof.

7.2 Remedies

Upon the occurrence of an Event of Default the non-defaulting party shall have all rights and remedies at law and at equity.

8. MISCELLANEOUS

8.1 Notices

Any and all notices given, or required to be given hereunder shall be in writing and shall be deemed to have been adequately given when received by the party to whom such notice is being given. Notices shall be addressed if to Seller to: ENERGY PARTS SOLUTIONS, LLC, Attn: Jeff Canon, 2031 ProEnergy Blvd., Sedalia, MO 65301 USA; and if to Buyer to: DERWICK ASSOCIATES, S.A., Attn: Alejandro Betancourt Lopez, MMG Tower, Piso 16, Calle 53, Urbanizacion Marbella, Ciudad de Panama, Republica de Panama, Presente, or such other address as the respective parties hereto shall from time to time designate in writing to the other party.

8.2 Captions

Caption and section headings set forth are for convenience of reference only and shall not in any manner be deemed to limit or restrict the context of the section to which they relate.

8.3 Applicable Law

This Agreement is entered into and shall be governed by and interpreted in accordance with the laws of the State of Missouri notwithstanding its conflict of law provisions.

8.4 Entire Agreement

This Agreement supersedes all prior understandings, representations, negotiations, and correspondence between the parties and constitutes the entire Agreement between the parties with respect to the transaction contemplated and shall not in any manner be supplemented, amended or modified by any course of dealing, course of performance or usage of trade or by any other means except by a written instrument executed on behalf of the parties by their duly authorized officers.

8.5 Confidentiality

Seller and Buyer agree to treat this Agreement and the terms hereof as confidential and not to, without the prior written consent of the other party hereto, disclose the terms hereof to any other person except (i) to its counsel and accountants or other agents or professional advisors in connection with or relating to the

transactions contemplated by this Agreement, (ii) to any court, governmental agency or instrumentality or other supervising body requesting such disclosure, (iii) to any person as may be required by any government regulation or order (including any regulation, request or order of a bank regulatory agency or authority), law, statute, regulations, decrees, subpoenas or court orders, (iv) its directors, officers, employees, affiliates, successors and assigns, (v) to any banks or other financial institutions in any debt financing by or for the benefit of Buyer or (vi) in connection with any enforcement of the terms of this Agreement. Seller and Buyer shall cause its officers, directors, agents, and employees to comply with the foregoing paragraph.

8.6 Further Assurances

Seller and Buyer agree that each of them will, and will cause their respective representatives and affiliates, to execute and deliver such further instruments of conveyance and transfer and take such other action as may reasonably be requested by any party hereto to carry out the purposes and intents hereof.

8.7 Casualty Loss

If, subsequent to the date of this Agreement and prior to the date of Seller's receipt of the Purchase Price, any portion of the Equipment is destroyed by fire or other casualty, is taken in condemnation or under the right of eminent domain, or proceedings for such purposes are pending or threatened (collectively, "Casualty Loss"), Seller shall have the option to either (a) sell the Equipment notwithstanding any such Casualty Loss, and the Purchase Price shall be equitably adjusted per the mutual agreement of the parties or (b) terminate this Agreement without further obligation of either party except that the Buyer shall be entitled to the return of the full amount of any amount of the Purchase Price paid to Seller. In the event of subpart (a) above Seller shall (i) on the date of Seller's receipt of the Purchase Price, pay to Buyer all sums paid to Seller by third parties by reason of the Casualty Loss of such Equipment, (ii) assign, transfer and set over unto Buyer all of the right, title and interest of Seller in and to any unpaid awards or other payments from third parties arising therefrom, and (iii) not voluntarily compromise, settle or adjust any material amounts payable by reason of any Casualty Loss of any portion of the Equipment without first obtaining the written consent of Buyer.

8.8 Expenses

Except as otherwise set forth in this Agreement, Seller and Buyer shall each bear its own expenses (including, without limitation, attorney's fees) incurred in connection with the negotiation and execution of this Agreement and each other agreement, document and instrument contemplated by this Agreement and the consummation of the transactions contemplated hereby and thereby.

8.9 Submission to Jurisdiction

The parties agree to unconditionally and irrevocably submit to the exclusive jurisdiction of the federal or state courts sitting in Missouri, and any appellate court from any thereof, for the resolution of claim or dispute relating to or arising under this Agreement.

8.10 Excusable Delay

Neither Seller nor Buyer shall be responsible to the other for any delay ("Excusable Delay") in the performance of its duties under this Agreement (other than payment obligations) due solely to any cause beyond its reasonable control and not occasioned by its intentional act, fault or negligence including, but not limited to acts of God, strikes, lockout or other industrial disturbances, acts of public enemies, orders of any kind of the government of the United States or any state or local government or any of their departments, agencies or officials, or any civil or military authority, insurrections, riots, earthquake, fire storm, restraint of government and people, civil disturbances, or explosions. Either Seller or Buyer shall

promptly notify the other when it anticipates that an Excusable Delay has occurred or is likely to be incurred and in each case specify to the extent practicable the estimated extent of such delay. Except for an Excusable Delay, time shall be of the essence in the parties fulfilling their obligations under this Agreement.

8.11 Severability

If any provision of this Agreement is invalid or unenforceable, the balance of this Agreement shall remain in effect.

8.12 Limitation of Liability

NOTWITHSTANDING ANYTHING TO THE CONTRARY IN THIS AGREEMENT OR OTHERWISE, NO PARTY HERETO (OR ITS SUBSIDIARIES, AFFILIATES OR ASSIGNS) SHALL, UNDER ANY CIRCUMSTANCE, BE LIABLE TO ANY OTHER PARTY (OR ITS SUBSIDIARIES, AFFILIATES OR ASSIGNS) FOR ANY CONSEQUENTIAL, EXEMPLARY, SPECIAL, INCIDENTAL OR PUNITIVE DAMAGES CLAIMED BY SUCH OTHER PARTY UNDER THE TERMS OF OR DUE TO ANY BREACH OF THIS AGREEMENT, INCLUDING, BUT NOT LIMITED TO, LOSS OF REVENUE OR INCOME, COST OF CAPITAL, OR LOSS OF BUSINESS REPUTATION OR OPPORTUNITY.

8.13 Binding Effect; Assignment This Agreement shall be binding upon and inure to the benefit of the parties and their respective successors and permitted assigns. No assignment of this Agreement or of any rights or obligations hereunder may be made by Seller or Buyer (by operation of law or otherwise) without the prior written consent of the other parties hereto and any attempted assignment without the required consents shall be void.

8.14 Counterparts

This Agreement may be executed in any number of counterparts, each of which will be deemed an original, but all of which together will constitute one and the same instrument.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed effective as of the day and year first above written by their duly authorized officers or representatives.

Seller:

ENERGY PARTS SOLUTIONS, LLC

By: _____

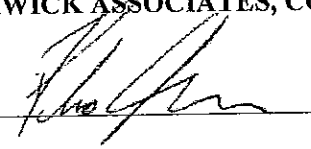
Print Name: _____

Title: _____

Date: _____

Buyer:

DERWICK ASSOCIATES, CORP.

By:  _____

Print Name: Pedro Trebbau

Title: Director

Date: 3/8/2010

Exhibit A

Equipment Description

1. TWO (2) GENERAL ELECTRIC LM2500+ GTG PACKAGES EACH CONSISTING OF:

Gas Turbine

17 Stage Axial Compressor

- 1st 6 Stages are VIGV
- Horizontal Split Casing
- 20:1 Compression Ratio
- 103 lb/s Nominal Inlet Mass Flow

Annular Combustor

- Liquid Fuel (Marine Gas Oil)
- Dual Igniters

6 Stage Power Turbine

Generator

Continuous Duty

2 pole, 3 phase 13.8kV, 0.8pf Brushless Exciter

Water-to-Air Cooled (TEWAC)

Voltage Regulator and Neutral Side Protection CT's

NEMA Class F Insulation & B Temperature Rise

Package

24V DC Batteries

92dBa Near Field Design

Three Stage Air Filters

Electro-Hydraulic Start System

DNV/Loyds Register Type Approved

Digital Control System with a Human Machine Interface (HMI)

Turbine and Generator Lube Oil Systems with

Plate and Frame Coolers

Turbine Factory Tested

On/Off-line Water Wash

1 Year Parts/Service Warranty

Package Familiarization Training

Electronically transmitted drawings

2. FOUR (4) GENERAL ELECTRIC LM6000 GTG PACKAGES EACH CONSISTING OF:

Gas Turbine

General Electric gas turbine model LM6000 is a two-shaft/two-spool engine consisting of a five-stage low pressure compressor, a fourteen-stage high pressure compressor, a two-stage high pressure turbine, and a five-stage low pressure turbine. The engine is equipped with a stainless steel mesh screen in the inlet air stream for "last chance" protection against foreign object damage. The engine is shock mounted and

shipped in position, with the exception of the coupling spacer, which is removed and shipped in a separate container.

Generator

Air cooled, 2-pole generator operating at 13.8 kV, 60 Hz. Generator is capable of handling power requirements throughout a wide ambient temperature range. A cooling water loop and its associated fans and pumps are not required. The generator includes a brushless excitation system with permanent magnet generator. Neutral and line side cubicles are included.

Unit Enclosure

The basic equipment package is supplied with weatherproof acoustic enclosures with sound attenuation to an average of 85 dB(A) at 3 ft 3 in (1 m) from the face of the equipment at 4 ft 11 in (1.5 m) above ground. The enclosures are completely assembled and mounted over the equipment prior to testing and shipment. The turbine and generator compartment is fully ventilated with belt driven fans. Explosion-proof lighting is provided in both compartments.

Gas Turbine / Generator Baseplate

The basic equipment package is supplied with the support structures for the gas turbine generator set consisting of a two-piece skid assembly, which is sectioned between the gas turbine and the generator. The full depth, bolted section is designed to provide the full structural properties of the wide flange I-beams. Full depth crossmembers are utilized to provide for a rigid design that is suitable for installation in earthquake areas (U.S. Seismic Zone 4) as well as providing a convenient structure for transportation. The baseplate support system is enhanced by the installation of a heavy-duty, welded superstructure, which utilizes structural tubing for wall columns and roof beams.

Air Inlet System

The basic equipment package is supplied with a modular, multi-stage filtration system consisting of inlet screens, a prefilter and a final barrier filter. All air for ventilation systems is filtered to the same level as turbine combustion air. An evaporative cooling system is included in the basic equipment package scope. Filtered air is silenced before entering the turbine plenum. This design results in a compact arrangement and eliminates the need for Buyer supplied inlet ducting when the standard design is utilized. Internal lighting of the filter house is provided to facilitate inspection and service. Package is also supplied with platforms and ladders to service the inlet filter. These items are packaged separately for shipment. Ladders, platforms and stairways to service other portions of the gas turbine generator enclosure are not included. Special or customized filter arrangements can be supplied, and they are quoted on an individual basis.

Turbine Exhaust

The basic equipment package is supplied with a circular, axial exhaust outlet with connection flange to facilitate in-line mounting of an HRSG or simple cycle exhaust stack.

Fuel System

The basic equipment package is supplied with a natural gas fuel system using an electronically controlled fuel-metering valve. All necessary shutoff valves, piping and instruments between the auxiliary skid connection and the turbine are included. For full-load operation, the gaseous fuel must be supplied to the baseplate at 675 psig \pm 20 (4,658 \pm 138 kPag). All necessary shutoff valves, piping and instruments between the baseplate connection and the turbine are included. Gas fuel must meet General Electric specification MID-TD-0000-1.

Lube Oil Systems

The basic equipment package is supplied with two separate lube oil systems: one for the gas turbine (synthetic oil) and one for the generator (mineral oil). The oil reservoirs and piping are all stainless steel, and the lube oil system valves have stainless steel trim. Each lube oil system has duplex filters, duplex

shell and tube coolers, and thermostatically-controlled electric heaters. The coolers, oil reservoir, and filters for each system are mounted on an auxiliary equipment module located next to the gas turbine baseplate. The auxiliary equipment module provides simplified piping connections and reduces Buyer's installation time and costs. Buyer must supply cooling water to the shell and tube coolers. Turbine lube oil must meet General Electric specification MIDTD-0000-6.

Electro-Hydraulic Start System

The basic equipment package is supplied with an electric motor driven hydraulic pump assembly, filters, cooler and controls, mounted on the auxiliary equipment module. A hydraulic motor is also mounted on the gas turbine accessory gearbox. Hydraulic hoses are furnished to connect the auxiliary equipment module and the main baseplate.

Fire Protection System

The basic equipment package is supplied with a factory installed fire protection system complete with optical flame detection, hydrocarbon sensing and thermal detectors, piping and nozzles in both generator and engine compartments. The fire protection system includes cylinders containing CO2 mounted on a separate skid. A 24 V DC battery and charger to power the fire protection system is also included. All alarms and shutdowns are annunciated at the turbine control panel (TCP). An alarm sounds at the turbine if the gas detectors detect high gas levels, or if the system is preparing to release the CO2. When the system is activated, the package shuts down, and the primary CO2 cylinders are discharged into the turbine and generator compartments via multiple nozzles, and the ventilation dampers automatically close. After a time delay and if required, the reserve supply of CO2 is discharged.

Digital Control System

The basic equipment package is supplied with a free-standing control panel suitable for mounting in an indoor, non-hazardous area. The control system features an integrated Woodward MicroNet Plus turbine control system, vibration monitor, digital meter, digital generator protective relay module and an HMI (human machine interface) display of key discrete and analog data. The operator selects HMI displays with convenient touch screen control. Alarm and shutdown events are displayed on the HMI automatically. An Ethernet TCP/IP EGD or RS485 Modbus Port is provided to transmit unit conditions (status, pressures, temperature, etc.) to the Buyer's distributed control system. Power for the control panel is provided by a dedicated 24V DC battery system with dual 100% capacity chargers, which are shipped separately for installation by others.

Generator Protective Relays

The basic equipment package is supplied with a microprocessor-based generator protective relay module, mounted in the TCP. The protective relay system includes functions necessary for protection of the generator.

Soak Wash System

The basic equipment package is supplied with a turbine cleaning system, which allows cleaning the compressor section of the turbine during full power operation. The same system reservoir and piping are utilized for off-line soak washing. Auxiliary skid connections are provided for Buyer supplied purified water at a maximum of 50 psig (345 kPag) and air at 100 – 120 psig (689 – 827 kPag). Buyer is required to provide purified water meeting General Electric specification MID-TD-0000-4, detergent meeting General Electric specification MID-TD-0000-5, and air filtered to ISA S7.3 standards.

3. TWO (2) PRATT & WHITNEY POWER PAC FT-4A-9 PACKAGES EACH CONSISTING OF:

General

This information applies specifically to an FT4A-9 LF series and model gas turbine repackaged by PW. The FT 4FA-9 LF is a gas turbine engine consisting of a gas generator and a free turbine that uses the hot gases produced by the gas generator to develop shaft horsepower. The free turbine is coupled through an output shaft to an electric generator manufactured by the Electric Machinery Manufacturing Company. The complete unit is called a Turbojet Power Pac and is operated by liquid fuel. Gas fuel or dual fuel operation is available as an option.

The unit is designed to generate power for peaking operation. Power output will vary because of changes in the inlet air conditions. Performance assumes that the gas turbine will be operated on clean distillate fuel or natural gas fuel conforming to the PWA Fuel Specifications.

Operational Features

The Power Pac may be operated manually or automatically from either the Local Control Panel located in the Power Pac control house or from an optional Remote Control Panel.

The Power Pac may be synchronized in parallel with other electric generators already on the line, or operated alone as an isolated power source. Battery power is provided to start and operate the Power Pac in complete independence of external sources of power for black starts.

The Power Pac can be automatically started, synchronized and loaded to full output in approximately three minutes. On a normal shutdown, the unit is automatically unloaded, sequenced through the breaker opening, reduction-to-idle and cool-down phase of operation after which the gas generator rotors and the free turbine coast to a stop. In the event that an electrical fault or a mechanical malfunction should occur in any of the Power Pac equipment, the unit is protected by alarms and automatic shutdown devices.

Gas Generator

The gas generator has the characteristics described for dual compressor gas turbines in Pratt & Whitney Aircraft General Operating Instructions for Gas Generators and Turbine Engines for Industrial and Marine Use, PWA Oper.Instr. 194, to which reference should be made for complete information pertaining to how an engine of this type operates. A full description of the gas generator may be found in the Pratt and Whitney Aircraft FT4A-9 Service Manual. The material presented in the Service Manual is supplemented by the information in the specific operating instructions.

Ignition System

Ignition of the gas generator is furnished by a dual, 125 volt DC, 4-joule ignition system. The two independent ignition systems, each with its own igniter, operate simultaneously when energized. The ignition system operates only during the gas generator starting cycle. The speed mechanism in the PLC circuit limits the time the system is energized.

Gas Generator Synchronization

The gas Generator synchronization and the speed of the gas generator to provide loading following synchronization, is controlled and Free Turbine Speed Control The speed of the free turbine prior to by a new Allen Bradley Controllogix PLC and fuel control designed to WGPW specifications. This control senses gas generator high rotor speed (N2) free turbine speed (N3) gas generator exhaust gas temperature and load, and positions a fuel modulating valve to regulate gas generator fuel flow.

Free Turbine over speed is sensed by a mechanical over speed control and the fuel control. Either control will close the fuel shutoff valves in the event free turbine speed exceeds $4,125 \pm 25$ rpm (less in 50 HZ applications).

Air Inlet Anti-Icing System – The system consists of an ice detection unit, hollow gas generator inlet guide vanes and a hollow nose cone. Hot, high pressure air is circulated through the guide vanes and nose cone whenever icing conditions exists. The system may be operated either manually or automatically

from the Gas Turbine Panel in the Power Pac control house; however, for normal operation, the control switch on the ice detection unit should remain in the Automatic position. In the Automatic position, the anti-icing air valves are opened automatically whenever icing conditions occur in the gas generator inlet plenum chamber during operation. When operating in Automatic-Parallel, the sequencer prevents operation of the anti-icing relay until after synchronization. The anti-icing system is automatically turned off when the Power Pac is shut down.

A temperature and humidity transducer, located on the inlet plenum door adjacent to temperature sensor for the fuel control, supplies the signals to the anti-icing system. Icing is considered likely whenever the gas generator inlet temperature is below 46°F and simultaneously the relative humidity of the inlet air is greater than 90%.

Free Turbine – The free turbine is connected to the exhaust case of the gas generator, but rotates independently of the gas generator compressors and turbines. It is directly coupled to the electric generator and rotates at a speed of 3,600 rpm (or 3000 rpm in 50 HZ applications) when synchronized to the line frequency.

Electric Generator and Excitation System

The Electric Machinery Air Cooled Open Type AC generator is rated at 21,875 kva, 0.85 power factor, 13,800 volts, 3-phase, 60 hertz (3,600 rpm). Excitation and voltage regulation is controlled by a Cutler Hammer static excitation/voltage regulation system.

Lube Oil Systems

Gas Turbine Lube System – The gas turbine has separate lube systems for the gas generator and free turbine. For a full description of the internal lube oil systems for the gas generator and the free turbine, refer to the applicable PWA FT4A Service Manual. The lube oil used in both the gas generator and the free turbine lubrication systems must be a Type II synthetic gas turbine oil conforming to the latest revision of PWA Oil Specification No. 521. Refer to P&WA Turbo Power Service Bulletin No. 6, latest revision, for a listing of approved oils that are commercially available. Synthetic oils for the gas turbines can be manufactured from any of several different basic materials. Since some of these materials are not compatible with one another and since synthetic oils of different brands are not necessarily derived from the same basic materials, even though they meet the same specifications, it is important to ensure that the synthetic oils produced by different manufacturers are not mixed, or indiscriminately used together, in the same gas generator or free turbine lube oil system. The battery, making DC power available at all times to both the DC auxiliaries and to the inverter, which supplies the essential AC auxiliaries, enables the Power Pac to be started without an external power source (except when equipped with a hydraulic start system). Once the Power Pac is in operation and the generator main circuit breaker (52G) is closed, the non-essential AC auxiliaries, such as the battery charger, space heaters, cooling fan motors, etc., are furnished AC power directly from Power Pac output.

Fire Extinguishing System

The gas turbine enclosure is provided with a fire extinguishing system that consists of five 75 pound (content weight) CO2 bottles, a 5 pound (content weight) pilot N2 bottle, a one pound (content weight) manual release remote bottle and two Fenwall fire detectors. The fire detectors are located above the gas generator and are set to activate at 450°F, which is approximately 250°F higher than the highest temperature normally encountered at the detector locations.

In the event of a fire within the gas turbine enclosure, the detector unit opens the solenoid valve on the pilot N2 bottle and releases control pressure to operate the discharge heads on the CO2 storage bottles. Although the entire system is discharged, the valves on two of the bottles are pilot-operated discharge heads and are opened first. Pressure from the two pilot-operated discharge heads and are opened first. Pressure from the two pilot-operated discharge heads then passes through the manifold to open the discharge heads on the remaining three CO2 storage bottles. A total of 375 pounds (content weight) of

CO2 is discharged in approximately two minutes through two shower heads located in the gas turbine enclosure.

The system may be manually discharged from the fire system remote manual release station (fire box), located on the outside of the electric generator enclosure, by removing the safety pin from the small one pound (content weight) actuator bottle and depressing the handle. The system may also be manually discharged by removing the safety pin from either one or both of the pilotoperated discharge heads and opening either one or both of the red handwheels. The gas turbine enclosure is normally cooled by air that enters the enclosure through the secondary air inlets. In the event of a fire, the discharge pressure of the fire extinguishing system will close the dampers of the secondary air inlets.

Also, a pressure switch energizes a relay which will initiate the following:

- The 4-1 master start lockout circuit will open, making it impossible for the Power Pac to be started.
- 2. The quick-acting fuel shutoff valve (fire valve) for the gas generator will automatically close.
- 3. The 86G-1 relay will be automatically tripped, which will initiate an emergency shutdown of the Power Pac. Refer to Section V, Protective and Auxiliary Devices.
- 4. An alarm will sound and the Gas Turbine Enclosure Fire annunciator will illuminate.

NOTE: The secondary air inlet dampers and the pressure switch in the electric generator enclosure must be manually reset prior to further Power Pac operation. To reset switch, push plunger located at the bottom of the switch to the In position. Reset dampers by installing release cable end in pressure line sockets located on enclosure roof. The Power Pac may be electrically locked out without discharge of the CO2 system by pulling the plunger to the Out position

Starter System

The gas generator is equipped with a hydraulic starter which operates on hydraulic pressure provided by an electric hydraulic pump skid. The PLC controls the starter speed which normally engages the engine at zero rpm and drives the compressor up to speeds necessary to sustain operation after light off. An additional feature of this starting system provides for controlling the rate of flow to permit reengagement of the rotating engine at about 800 rpm without damage to the starter bearings or shear coupling.

Instrumentation and Controls

The Power Pac can be operated locally from the Power Pac Control House or from an optional remote panel.

This unit is offered with a Powell control house repackaged into the unit in 1999. It includes a new Allen Bradley Controllogix PLC and fuel controller, Cutler Hammer motor controls, engine and generator control panels and 125 VDC battery bank with charger.

Engine and Generator Enclosures

The gas turbine engine is housed in an acoustically treated engine enclosure including inlet and exhaust silencing and an inlet vandal hood. The generator enclosure is also acoustically treated with air inlet and exhaust silencing.

4. EXCLUSIONS

Listed below are the limits/exclusions to the Seller's scope of supply. All piping, wiring, cables, ducts, etc. connecting to these points is furnished by Buyer (or others).

Equipment System	Limits of Seller Scope
All piping, including Fuel Gas, Fuel Oil, Steam, Cooling Water, Heating Water, Demineralized Water, Lube Oil, Compressed Air, Instrument Air, Hydraulic Start Oil	Flanged or threaded connection on baseplate
Inlet Air-to-Filter	Atmosphere (non-standard duct by others)
Turbine Package Ventilation/Cooling Air	Atmosphere (non-standard duct by others)
Turbine Exhaust	Exhaust flange on main baseplate
Instruments on baseplate	Terminal box on baseplate
Instrument wiring in Turbine Control Panel	Wiring Terminal block in Turbine Control Panel
High Voltage Connections	Bus bar in lineside cubicle
Generator Ground Connections	Neutral cubicle
Electric Motors	Terminal box on individual motor
Ladders and Platforms for Air Filter	Ladders and Platforms for Inlet Air Filter maintenance only
24 V DC Batteries and Chargers for Control System and Fire and Gas Systems	Battery terminals to baseplate (if supplied loose)

Further Exclusions to Seller's Scope of Equipment

- Civil engineering design of any kind
- Building and civil works
- Site facilities
- Drains and/or vent piping from the gas turbine package to a remote point
- Fuel storage, treatment and forwarding system
- Site grounding
- Lightning protection
- Power system studies
- Sensing and metering voltage transformers
- Machine power transformers, and associated protection
- Grid failure detection equipment
- Off-loading, transportation and storage
- Off-skid cabling, and design of off-skid cable routing
- Balance of plant and energy optimization controls
- Anchor bolts, embedments, and grouting
- Distributed plant control
- Buyer's remote control
- Field supervision

- High voltage transformer(s), cables, and associated equipment
- Interconnecting piping, conduit, and wiring between equipment modules
- Plant utilities, including compressed air supply and off-skid piping
- Battery containment
- Lube oil measurement other than that defined in the scope of supply
- Additional lube oil breather ducting other than that defined in the scope of supply
- Fuel transfer pump
- Off-skid fuel block and vent valves
- Fuel supply pipework beyond the scope of supply
- Generator controls other than that defined in the scope of supply
- Load sharing control
- Balance of plant controls
- Field Performance Testing
- Site Labor
- Ladders, Stairs, and Platforms for equipment beyond the gas turbine
- Absorption chiller and chilled water supply system
- Boiler feed pump and auto level control assembly
- Bus bars and bus duct beyond generator lineside and neutral enclosures
- Cooling tower and circulating water system
- Deaeration and chemical injection equipment
- Desuperheater equipment
- Filter house support structure, other than standard
- Gas compression, filtration, and separation or regulation equipment
- Heat recovery boiler and blow down controls
- Power plant calibration tools and ordinary hand tools
- Spare parts
- Steam filtration and purification equipment
- Steam turbine condenser and condensate pumping equipment
- Water injection pressurization equipment
- Water treatment and purification equipment