

 DERWICK <small>DERWICK ASSOCIATES CORP.</small>	MINUTA DE REUNIÓN	PÁGINA 1
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PROYECTO: Ampliación de la Capacidad de Generación y Transporte de Electricidad en la Isla de Margarita		CÓDIGO DE MINUTA MR-PJBA-10-002
LUGAR: SEDALIA, USA.	FECHA: 19/11/2010 & 20/11/2010	PREPARADO POR: Domingo Guzmán López
PRESENTES		
NOMBRE	FIRMA	EMPRESA
Jose Ortiz		EDC
Oswaldo Campos		EDC
Rafael Narvaez		SENECA
Ramón Briceño		INELMECA
Manlio Monticelli		INELMECA
Domingo Guzmán		DERWICK
Iker Candina		DERWICK
Mike Horn		DERWICK
Steven Boerckel		DERWICK
Chris Brown		DERWICK
Chris Garret		DERWICK
Tom Koontz		DERWICK
Omar Petit		DERWICK
Joaquín Mavares		DERWICK
Marcial Trujillo		DERWICK
Hildemaro Torres		DERWICK
Steve Huval		DERWICK
Scott Taylor		DERWICK
David Drake		DERWICK
PROPÓSITO GENERAL: Sedalia visit. Inspection of engineering and procurement executed up to date.		

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PUNTOS:			
ITEM	DESCRIPCIÓN	RESPONSABLE	FECHA
1.	<p>EDC or their subcontractors to provide the engineering, material, and installation of the foundations, conduit, cable, breakers & motor starters, logic and control, pipe and supports for the following scope:</p> <ul style="list-style-type: none"> ○ Liquid Fuel System: from the treated liquid fuel tank(s) to the liquid fuel forwarding skids; and from the liquid fuel forwarding skids to the accessory module on the turbine centerline. ○ Demineralized Water System: from the treated demineralized water storage tank(s) to the demineralized water forwarding pump skids; and from the forwarding pump skids to the water injection skid; and from the water injection skid to the turbine compartment on the turbine centerline. 	INELMECA/EDC	
2.	Derwick will provide a Liquid Fuel Forwarding Skid for each unit that consists of two 100% pumps, duplex strainer, and a flow control valve with a flanged connection for recirculation back to the tank. A flow meter is included in the "Liquid Fuel Management Spool" that is just upstream of the accessory module. The flow meter is placed as close as possible to the unit to get most accurate account of fuel and to tie into the gas turbine control system (totalizer).	DERWICK	
3.	Derwick will provide a Demineralized Water Forwarding Skid for each unit that consists of two 100% pumps and flow control valve with a flanged connection for recirculation back to the tank.	DERWICK	
4.	Derwick will provide a Water Injection Skid for each unit that consists of a duplex filter, flow meter with feedback control, VFD drive for the pump motor, and a stop valve. A water injection pump is included in the water injection skid.	DERWICK	

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5.	Derwick will supply a Fuel Management Spool for each unit which includes a secondary stop valve, flow meter, and pressure control valve.	DERWICK	
6.	Derwick will provide outline drawings of the demineralized water forwarding, liquid fuel forwarding, and water injection skids, the associated power requirements, and recommendations for the physical location of the skids.	DERWICK	
7.	Derwick stated that all systems, equipment, and material on the turbine and accessory bases (on base) for the dual fuel modification will be provided and installed.	DERWICK	
8.	<p>T. Koontz reviewed the New Systems that will be added to the turbine and accessory modules (new drawings)</p> <ul style="list-style-type: none"> - Reviewed liquid fuel, atomizing air, and water injection systems: <ul style="list-style-type: none"> o Derwick confirmed that their design is based directly on GE system design. Derwick utilized the same vendors to purchase equipment and components for the Margarita Project. o Derwick performed piping and electrical take offs directly from existing dual fuel systems o Equipment, piping, and electrical systems will be installed in the turbine and accessory compartments to similar dimensions and locations as GE installed systems. o It was confirmed that any systems or equipment that is supplied per GE specifications will not require engineering calculations or specifications. 	-	
9.	<p>T. Koontz reviewed the existing systems on the turbine generator that will be modified to accommodate the dual fuel configuration:</p> <ul style="list-style-type: none"> - Reviewed the Cooling Water, Purge Air, Control, Hydraulic, & Trip Oil, False Start Drain, and instrumentation / electrical systems. <ul style="list-style-type: none"> o Derwick requested the Parts Manual specific to the turbine serial numbers at Margarita to confirm existing design so the final scope of the modification can be completed o Derwick have made conservative speculation on the modifications required to the existing systems since the drawings were not available. These speculations were based on dual fuel modifications that were performed on similar units. o Derwick stressed the importance and urgency to finalize these drawings. Some systems will require modification or addition to BOP systems. The most critical is the false start drain system that will tie into the drains to 	-	

	<p>the oily water separator system that must be casted into the turbine generator foundation. EDC acknowledged the urgency and will communicate with their EPC Contractor.</p> <ul style="list-style-type: none"> o EDC requires calculations or specifications for systems or equipment that will be modified or applied outside of the GE specification. o Derwick confirmed that the cooling water system will need to be evaluated for the additional heat rejection capacity and back pressure on the system. o Derwick confirmed that calculations and specifications will be provided for the motor starter and breaker for the atomizing air booster compressor motor. 		
10.	<p>EDC discussed the quality documentation that will be required for equipment, components, and fabrications.</p> <ul style="list-style-type: none"> - Mill certifications will be required for pipe and piping components - Certifications of welder tests - Calibration certifications and test reports that apply to valves, meters, and instrumentation 	-	
11.	<p>T. Koontz reviewed the Drawing List for project</p> <ul style="list-style-type: none"> - Derwick explained that current drawing list is color coded. Drawings in green are new drawings or complete systems to be added. Drawings in yellow are drawings of existing systems on the units that will need to be modified to accommodate the dual fuel conversion - EDC will require Mechanical, Electrical, and Instrumentation Calculation Sheets for any equipment or components that are not specified by GE - EDC require a document that describes the Basis of System Design for the Dual Fuel Modification - EDC will modify the Plot Plan based on Derwick's recommendations for skid locations. - The SHA Plan, HAZOP, ACR, and SIL will be developed by construction team at the site and led by EDC. Derwick will participate as required. - The Piping and Instrumentation Diagrams (process and flow schematics) will be provided for systems associated with the dual fuel modification - EDC require a constructability document that summarizes the major steps for assembly and implementation of the dual fuel modification. - Existing drawings currently associated specifically to the Margarita units that will be modified to implement the dual fuel configuration will be named with the same drawing number and a suffix " -LF" added to note the 	-	

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	liquid fuel addition.		
12.	Tour of Warehouse Facility - Derwick and EDC walked through the warehouse containing boxes of material, equipment, and components for the Margarita Dual Fuel Project. Boxes were open for visual verification and to confirm proper packing. - Derwick supplied EDC with current packing lists of the equipment for the modification	-	
13.	Reviewed Water Injection Skid Drawings - EDC noted that an air conditioner can be provided from the USA because Margarita Island is a duty free port. - EDC requested a calculation or specification for sizing air conditioner. EDC is concerned that the skid will become too hot. Derwick pointed out that the skid has insulation on inside of the enclosure walls - EDC requested the pressure and flow rate required for the instrument air usage of the skid	-	
14.	Reviewed Demineralized Water Forwarding Skid - EDC requested a duplex filter on the skid piping upstream of the pump suction similar to the liquid fuel forwarding skid. - Derwick stated that the skid fabrication was complete. Assembly of the pump & motor with piping is being delayed until the pump & motor can be specified and procured.	-	
15.	Reviewed Liquid Fuel Forwarding Skid - EDC noted that the pump specification can be ANSI but requires the pump seals to be API. EDC Recommended API Plan 23 for the pump seals. Derwick to research and finalize in pump specification - EDC requested that the piping on the liquid fuel forwarding skids be made of stainless steel. Derwick stated that the final duplex filter is on the accessory module. All piping down stream of this duplex filter is made of stainless steel. - Derwick stated that the skid fabrication was complete. Assembly of the pump & motor with piping is being delayed until the pump & motor can be specified and procured.	-	
16.	Discussed BOP Interfaces and Plant Design Concerns - Derwick is currently waiting for balance of plant data to design and specify the demineralized water forwarding and liquid fuel forwarding pump & motor sets.	-	

	<ul style="list-style-type: none"> - EDC requested to review the motor & pump specifications prior to ordering the forwarding pump and motor sets. The motor information will be required by EDC to specify the breaker, motor starter, and cable sizes. - Derwick stated that the location of the forwarding pump skids (liquid fuel and demineralized water) is not their responsibility but would provide their recommendation on the plot plan. Derwick will plan for the liquid fuel forwarding and demineralized water forwarding skids to be placed next to their associated storage tanks. - Derwick stated that they would recommend the location of the water injection skid and provide a mark-up of the plot plan to reflect their recommendation. - Derwick stated that all system skids will include the Data Sheet Quality Assurance followed during the fabrication or assembly. - EDC and Derwick discussed commissioning responsibilities. Derwick confirmed that the scope of supply for commissioning associated with the dual fuel modification includes only a Mechanical and a Controls Technical Advisor to oversee commissioning activities. Derwick also stated that a proposal for turnkey commissioning of the gas turbine generators was submitted. This proposal was included with the control system modification and included all the commissioning of the units including the systems associated with the dual fuel modification. 		
17.	<p>Discussed Control System with Steve Huval and Scott Taylor (conference call)</p> <ul style="list-style-type: none"> - EDC voiced their concerns about upgrading the Mark V and requested that the Mark V system be upgraded. EDC asked if all the software (controls logic, sequencing, set points, etc.) to control the turbine through start-up and operation was included in the retrofit proposal supplied by Derwick. - Derwick confirmed that the existing Mark V system is not dual fuel ready. The system can be upgraded for the dual fuel operation but the additional hardware required would be second hand (GE does not sell new components) and the reliability of the system could not be guaranteed. Based on this fact, Derwick does not recommend an up rate solution for the Mark V. - Derwick stated that the existing proposal to up rate the existing Mark V will use an Allen Bradley Platform. This proposal includes all the hardware and software to 	-	

	<p>completely replace the existing turbine control system and includes all the software and logic for the dual fuel modification scope of work. However Derwick would utilize the generator control panel, instrumentation, and relays currently existing on the unit. The current proposal also assumes that the Bentley Nevada vibration system will be reused unless the customer has a preference to replace it for an additional charge.</p> <ul style="list-style-type: none"> - Derwick also stated that the Allen Brady platform has been successfully utilized as a replacement for a many turbine control systems for the past two decades. Derwick explained that this hardware can also be used to control BOP equipment because of the expandability of the Allen Bradley system. - EDC is still reviewing the Proposal and the plan for the turbine control system 		
18.	<p>Tour of Campus</p> <ul style="list-style-type: none"> - Derwick provided EDC with a tour of their facilities 	-	
19.	<p>C. Garrett discussed details and approach to the conversion of the primary and secondary fuel nozzles from Gas Only to Dual Fuel.</p> <ul style="list-style-type: none"> - Derwick stated that the modification design basis was developed from actual flow test data taken from 3 sets of Nozzles manufactured by GE's vendor and based on GE specifications and designs. All the registers of Quality Control regarding the nozzle conversion will be provided with the nozzles pieces. - Derwick discussed steps taken to execute the modification of the primary and secondary nozzles including the quality requirements, and deviations from GE's dual fuel design. 	-	
20.	<p>C. Garrett provided a tour of the fuel nozzle area of the shop and showed EDC specific steps taken to modify the primary fuel nozzles.</p>	-	
21.	<p>C. Garret demonstrated tests on the primary and secondary fuel nozzles</p> <ul style="list-style-type: none"> - Flow tests for the primary and secondary nozzle including liquid fuel, gas fuel, and atomizing air passages - Spray pattern test for the liquid fuel of the primary and secondary nozzle - Pressure test of the end cover for the primary fuel nozzle 	-	
22.	<p>EDC requested the flow test data sheet and the flow specifications for the primary and secondary fuel nozzles</p>	-	

<p>23.</p>	<p>Closing Comments</p> <ul style="list-style-type: none"> - Derwick stated that the dual fuel modification equipment and material should not be shipped until EDC are ready for it, however Derwick did not want payment to be held up. EDC confirmed that it would be best to keep equipment in our warehouse until it is required and payment will not be held for this reason. - EDC stated that the units are expected to be shipped to Margarita sometime in February. Derwick requested to be notified when the units are shipped so the dual fuel equipment can be shipped to site. - Derwick stated that they would like to be notified 2-3 weeks before the first unit is set onto the foundation. This notification is required so Derwick can start mobilization of their team to install the dual fuel modification package. - Derwick provided EDC with a CD containing a) system drawings that were discussed, b) current packing list, c) Fuel Nozzle Presentation, d) Organization for the site team, e) System descriptions, f) P&ID's - EDC stated that the unit numbers for Margarita turbine generators will be JBA-1 and JBA-2. The nameplates for the skids will be labeled accordingly. 	<p>-</p>	
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