

**Undertaking 84**

**Page 14, line 18 to Page 15, line 4**

***Re: Level two condition assessment Hydro - RFP document***

**Undertaking to provide...outlined schedule... (in RFP document)**

Please find attached as Undertaking 84 Attachment 1 the RFP document that was prepared for the level 2 condition assessment of the Holyrood Thermal Generating Station, subsequently awarded to AMEC. Included in this RFP is the planned schedule, which is outlined in section 3.6 of the Draft Agreement attached to the RFP document.

## **NEWFOUNDLAND & LABRADOR HYDRO**

### **REQUEST FOR PROPOSALS**

### **LEVEL 2 CONDITION ASSESSMENT & LIFE EXTENSION STUDY**

### **GAS TURBINE GENERATOR AND BALANCE OF PLANT**

### **Holyrood Thermal Generating Station**



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**NEWFOUNDLAND & LABRADOR HYDRO**

## 1. PURPOSE

- .1 The purpose of this Request for Proposals (RFP) is to invite Proposals to provide consulting engineering services for all work required to perform an Electrical Power Research Institute (EPRI) Level 2 condition assessment and life extension study for the Holyrood Thermal Generating Station (HTGS) gas turbine generator and balance of plant including cost estimates to complete the refurbishment work identified during the Level 2 condition assessment. In addition, Proposals shall include a scope of work and cost estimates to replace the existing gas turbine and balance of plant with a new or good condition used mobile generating plant (hereinafter called the "PROJECT").
- .2 Definitions used in this RFP have meanings given in draft Agreement included with this RFP.
- .3 PROPONENT means a consultant submitting or invited to submit a proposal in response to this RFP.
- .4 Terms and conditions of the draft Agreement shall also apply to this RFP.

## 2. BACKGROUND INFORMATION

### .1 INTRODUCTION

Newfoundland and Labrador HYDRO (HYDRO) is an utility which owns and operates facilities for the generation, transformation and distribution of electricity to utility, industrial and residential customers in the Province of Newfoundland and Labrador. In the island interconnected grid, HYDRO has nine (9) HYDRO-electric generating plants with a total installed capacity of 980 MW and five (5) thermal generating plants with a total installed capacity of 626 MW.

### 2. DESCRIPTION

The gas turbine generator at the HTGS is a black start unit for the plant. In addition, it is occasionally used to provide support for Island Interconnected Grid system.

The gas generator employs a Rolls-Royce AVON 1533-70L (#37029) aeroderivative gas turbine used by Associated Electrical Industries (AEI) of Manchester, England as the power source for the 13.5 MW packaged generating unit. Manufacture of this type generating unit began in the mid 1960's. The unit was supplied to the Newfoundland and Labrador Power Commission in 1966 and was considered to be a development model. The generator unit itself is comprised of a number of components including an inlet plenum, AVON 1533-70L power turbine, exhaust system, gearbox, generator, fuel oil system, governor/fuel control system, lubricating oil system, fire suppression system, and building structure.

The gas turbine went in service at the HTGS in 1986. As of December 2010, the unit had a total of approximately 4717 operating hours, +386,000 idle hours, and 2548 starts. Due to the age of the gas turbine and balance of plant, the large number of idle hours, and its exposure to a marine environment, it is now necessary to perform a comprehensive condition assessment and life extension study of the entire facility. In general, the unit and balance of plant equipment has reached or exceeded its life expectancy and life extension work is necessary to continue operating with a high degree of reliability. The study will identify the measures that need to be taken to ensure reliable operation of the gas turbine and balance of plant as the HTGS operates as a generating facility up to the year 2015 and as a standby facility up to the year 2020.

### 3. AVAILABLE INFORMATION

To assist PROPONENTS in preparing proposals, some general information related to the HTGS gas turbine and balance of plant is being provided as follows:

#### 1. Inlet Plenum

The inlet plenum is designed to provide approximately 140,000 cubic feet per minute of combustion air to the jet intake. This plenum is constructed of structural steel plate and framing supported by a concrete foundation. To reduce compressor damage and blade fouling, the inlet air must be free of dust and dirt. Filtration is accomplished by 72 high efficiency "Farr" filter assemblies supported on tubular columns above the intake. The inlet silencer consists of acoustical splitters in a steel shell that is designed with round leading edges to create a bell-mouth entry. The trailing edges are tapered to ensure a low pressure drop and uniform flow characteristics. The plenum chamber is built from 10 cm (4 inch) thick noise-shield panels, packed with acoustic fill and secured to a rigid steel frame.

## 2. Power Turbine

The power turbine is an Associated Electric Industries Ltd. (AEI) design, manufactured in Manchester, England in early 1966. The power turbine is a single stage overhung machine designed for a normal operational speed of approximately 4900 rpm. The power turbine is connected to the generator via a gearbox with a ratio of 4:1. The power turbine and gearbox are mounted on the centre section of the unit bedplate with this section also forming the main lubricating oil tank. Auxiliary and emergency oil pumps are mounted on this same base plate. The power turbine casings (volute) were replaced in 1986.

## 3. Exhaust System

The exhaust casing (volute) is a welded fabrication divided along the horizontal centreline. It turns the gasses transversely to the machine and vertically upwards to the exhaust silencer.

The exhaust stack is constructed of heavy gauge steel plate with light gauge steel cladding on the exterior. The exterior cladding of the lower half of the exhaust stack is constructed of heavy gauge steel plate. This stack was replaced during the 1986 major upgrade. The snow doors on the exhaust stacks are pneumatically actuated and were a new addition in 1986 to reduce corrosion of the volute and power turbine from infiltration of snow and rain water which promoted corrosion within the unit. New limit switches installed on the doors in 2009 indicate the position (opened or closed) of each door at the control station.

## 4. Gearbox

The main gearbox was manufactured by AEI in Manchester, England. It is designed to provide an approximate 4:1 speed ratio from the power turbine shaft to the main generator shaft. The gear train is fitted to the power turbine rotor by semi-flexible coupling housed within the gearbox. The gears are of the single helical, single reduction type with the pinion mounted directly above the wheel. A removable top cover allows for inspection without disturbing the alignments.

## 5. Generator

The generator is an air-cooled, 14MW, 13.8 kV, 3 phase, Type AG 80/100, built by Associated Electric Industries (AEI) of Rugby, England in 1966. It has a rotating-field, salient-pole tube with 6 poles and rotates at 1200 rpm. The brushless exciter eliminates the danger of contamination by carbon dust and minimizes maintenance. Semi-conductor rectifiers rotating within the generator / exciter shaft provide excitation for the main generator field.

## 6. Fuel Oil System

The plant's gas turbine uses No. 2 diesel fuel which is delivered to site by truck. The off-loading pump is located outdoors at the northwest corner of the gas turbine building and has above-ground piping connecting it to the bulk storage tanks. The two above-ground fuel tanks were fabricated in 1998 to ULC-S601-93 standards with double construction wall and have a total storage capacity of 200,000 litres. The offloading system is comprised of a single 600 volt pump arrangement with local start / stop control. Power for the motor is supplied from the gas turbine MCC control centre. The piping installation is typical with a 3 inch Y strainer, isolation valves and piping to the storage tanks.

Two 100%, 600 volt, centrifugal forwarding pumps provide low pressure No. 2 diesel fuel for the jet engine. The fuel passes through a duplex suction strainer and a 5 micron discharge filter before reaching the jet engine. The fuel line also incorporates a fuel flow / totalizing meter and a fire system trip valve prior to entering the building.

#### **7. Governor and Fuel Control**

The standard Avon fuel control system is used without alteration as a basis for the AP1 governing and fuel control system. The throttle valve is used as a generator valve and the H.P. cock as a fuel shut-off valve for normal and emergency shut-downs. The governing system is of the sensitive oil type in which fluid pressure is used to transmit the movement of the governor pilot valve to the operating mechanism of the governor valve, in this case the Avon throttle.

The governor is manufactured by Woodward and is driven via gearing from the end of the high speed pinion shaft. The governor is a fly-weight type and carries its own oil supply. Woodward Governor suggests that the present system has a reliability of about 50%. In addition, spare parts for this system are not carried and would have to be fabricated requiring long delivery times.

#### **8. Control Room & MCC/ Switchgear Room**

Within the gas turbine building, the electrical and control systems consist of a rotating brushless exciter, an automatic voltage regulator (AVR), a start rectifier, PLC control modules, motor control centre (MCC), electronic governors, synchronizer, and protection and monitoring equipment. The brushless exciter, AVR and start rectifier were manufactured by AEI Limited of Manchester, England in the mid-1960s. The programmable logic controller (PLC), governor, synchronizer and monitoring equipment were newly installed in 1986. The exciter and AVR unit act in combination to supply a controlled DC current to the wound rotor of the main generator which in turn controls its stator terminal voltage (13.8 kV) and Mvar delivery. The start rectifier converts station AC current into the high DC current necessary to rotate the Jet engine to ignition. The governor consists of two Woodward units: one that controls the jet acceleration on start-up and the second that controls the power turbine/generator during synchronization and Mwatt loading. In 1986, the Gem 80/500 PLC replaced all relay logic and was the primary controlling medium for the gas turbine. In 2009, it was replaced with an Invensys (Foxboro) DCS and the PLC logic was converted to DCS logic. The DCS controls the sequencing functions of the gas turbine as did the PLC. It is set up on the plant DCS network so that the screens can be viewed by the plant operator in the main control room.

#### **9. Excitation System**

The exciter is a rotating brushless type mounted on a stub to the main rotating shaft. It was designed to ANSI Specification C50-13. The AC output from the exciter armature is fed through a set of diodes that are mounted on the rotor and are used to produce a DC voltage. The voltage is fed directly to the field winding of the main generator which is also mounted on the same rotating shaft.

The excitation control system consists of a "Normal" and "Standby" automatic voltage regulator (AVR) backed up by a "Manual" control mode. The AVR controls the strength of the magnetic field in the exciter by varying the amount of current through the stationary exciter field windings.

#### **10. Switchgear**

Primary voltage generated by the GT (Gas Turbine) is 13,300 Volts. The installed gas turbine capacity is 13.5 MW, however based on limiting factors the unit sees normal operation of ~12 MW. Originally, this power was fed through a 13.8 kV oil circuit breaker and then through a 13.8 kV fusible switch. The oil circuit breaker is no longer functional but remains installed due to the current transformer (CT's) in this breaker. These CT's are essential to the protection of the generator and the 13.8 kV/4.160 14 MVA transformer. Power is then fed from the transformer at 4.160 kV to breaker SSB-2 in station panelboard SB12. Power from the CT or station power also feeds a 13.8 kV fused disconnect switch through a 75 kVA 13.8 kV/575 V transformer that provides power back to the station system.

**11. Fire Protection System**

The fire system is an Ansul Inergen total-flooding type that can operate automatically via fire detection or manually via pull stations. The system is comprised of Inergen storage containers, piping, nozzles, control panel, actuators, detection and alarm devices, and pressure relief dampers. It was installed in 2000 to replace the Halon fire system in respect of the ozone depleting substance regulations.

**12. Compressed Air System**

The compressed air system consists of a single 600 volt motor/compressor unit, a 310 L (82 gallon) storage tank, a Pall instrument air dryer and a small control and monitoring panel. The system is designed to supply 700 kPa instrument air to operate the power turbine snow doors, the main generator exhaust and intake louvers and the jet engine intake and exhaust cooling air louvers. It also has provisions for a four-bottle nitrogen back-up supply in the event of a compressor system failure. The control panel provides pressure indication for the system and a transfer valve to the nitrogen supply.

**13. Gas Turbine Building**

The existing gas turbine building was constructed in 1986. The building is of pre-engineered, galvanized metal-panel construction, 40 ft in width and 50 ft in length with R20 exterior wall insulation. The foundation is of conventional reinforced concrete pier/wall and floor slab construction and incorporates the original turbine and module slabs. A full height concrete block partition wall was installed to completely separate the turbine/generator sections from the remaining building area. It houses a one tonne hoist/track provision to move equipment to the service area. The electrical area is divided into a battery room, a control room and an MCC/switchgear section. It has an oil drain provision for both the service and turbine rooms complete with a reinforced concrete trap. A rolling service door between the turbine and work area is provided for fire containment but easily removed for heavy equipment.

**14. Operating Data**

As of December 31<sup>st</sup>, 2010, the operating data for the HTGS gas turbine is as follows:

Operating Hours	4717
Idle Hours	+386,000
Starts	2548

**15. Inspection and Repair History**

The following is a summary of significant inspection and repair work completed since 2003:

**16 October 2003**

- Annual borescope inspection;
- Slight erosion on casing. Reprotect next shop visit;
- Normal amount of carbon build up on nozzle heads;
- Borescope inspection satisfactory; and
- Intake plenum contained debris, chipped floor and flaking paint. Recommended clean up.

**10 August 2004**

- Annual hot section inspection & failure to start;
- Housing found to have corrosion on struts, will require protective coating next shop visit;
- Air plenum cleaner than last visit, holes still visible in walls;
- Compressor rotor and stator vane blades in dirty condition;
- Normal amount of carbon build up on nozzle heads;
- Slight damage to #7 Combustion Can; and
- Starting motor replaced, due to seizure. (Solved starting issue).

### **27 September 2005**

- Annual inspection and borescope inspection;
- Front Bearing Housing, outer bushes loose;
- Front Bearing Housing, Corrosion/ pitting;
- Corrosion/ Rust found in Plenum;
- HP NGV's have slight erosion of the leading edges and minor cracks in the trailing edges;
- Flame tubes have minor erosion on some of the wiggle strips and some carbon build up within the flame tube, especially around the dish where liquid fuel has collected;
- Normal amount of carbon build up on nozzle heads; and
- Hot gas leakage at Exhaust Transition duct to power turbine.

### **13 March 2006**

- Leak in each end of the gearbox at the bearing seals. (Caused fire when oil leaked into insulation around PT and dripped onto top of tank). Greenray discovered turbine shaft/seal modifications, recommended machining and reconditioning.

### **13 April 2006**

- Fuel oil leak on underside of gas turbine at IGV Ram, seal deterioration.

### **25 May 2007**

- AVON repair and borescope inspection: IGV ram leak, ignitor failure, hot air leak from #6 burner, bellmouth nuts loose, combustion casing borescope port bolts loose, bleed valve ducting broken and separated, fuel lag at idle and struggling at speed;
- Significant sparking coming from PT splash plate (rubbing shaft). Suggests bearings are worn and thus damaged seal;
- 2 IGV bushes replaced due to wear in the bush. (Majority of bushes and retaining nuts were replaced as well as the locking bush);
- Rebuild of the intake with securing bolts torque and locked;
- IGV ram replaced due to leak;
- Fuel filter replaced due to feed issues;
- Bolts holding PT seal were not tight, seal incorrectly installed;
- Ignitor, lead and box were replaced;
- High fuel consumption noticed at fuel drain valve, suspect worn seals on FCU and fuel pumps;
- Additional breather recommended for rear of gearbox unit, to reduce leaks;
- Compressor section; front bearing housing, inlet guide vanes have significant corrosion and coating loss;
- Combustion cans show signs of cracking, material loss (could lead to further turbine damage);



- IP nozzle guide vanes and HP nozzle guide vanes show signs of cracking on trailing edges;
- Change PT lube oil filters; and
- Replace/ Repair exhaust snow doors.

### 21 May 2008

- Package filtration inspection;
- Plenum survey;
- Windmill inspection of compressor;
- Borescope of compressor and VIGV;
- Fuel/oil system: connection, fuel pump/ oil pump, pipelines, oil level & quality, filter and basket removal (replacement consumables);
- On engine review: bleed valves, IGV ram (filter review), gearbox inspection (filters, speed pick up, consumable change), fuel control unit review, oil cooler, fuel filter change, burner removal (ultrasonic cleaning), fuel rail inspection, drain valve operation, thermocouple inspection (terminal cleaning), transition inspection, removal of insulation, rectify leaks, inspect LP blades;
- Borescope inspection: rear of compressor, snout area, combustion can, HP nozzle guide vanes, cooper beams (crooks washers), turbine section;
- PT and gearbox review; and
- Controls review.

### 10 June 2008

- Water pooling noted in intake plenum along with holes in structure and loose debris;
- Compressor showing significant corrosion and pitting on front bearing housing, inlet guide vanes and compressor stages, physical signs of salt evident;
- Combustion cans need to be replaced due to extensive corrosion, #1 and #2 burners removed for inspection. Seized bolts prevented removal of others;
- Hard impact damage evident in turbine stages, suspect debris from combustion cans and/or intake plenum;
- Suggested unit overhaul for blade recoating etc.; and
- Fuel pump and FCU to be repaired.

### 15 October 2009

- Engine removed and placed on site, in vertical stand for repairs (combustion cans);
- Combustion cans were replaced and FCU and fuel pump repaired;
- Loose discharge nozzles, due to broken brackets (2 off) to be replaced in future;
- PT inspection showed signs of light blade rub, none on stators. Diaphragm free of damage;
- PT inlet cone cranks, to be repaired;
- Thermocouple damage, quick fixed. To be upgraded;
- Exhaust stack needs replacement, lower components noted in good condition. Door opening components to be serviced; and
- Transition duct piston rings seals to be replaced.

### 20 November 2009

- Commissioning;
- Fuel control solenoid valve burnt out and replaced;

- Multiple start trips due to; low fuel pressure, low oil pressure, incomplete start sequence; determined igniter box malfunction, N2 probe incorrectly connected & FCU actuator tuning;
- Exhaust transition lagging replaced due to fuel saturation;
- Split air manifold cracks, to be repaired; and
- Suggest monitoring setup for the 8 EGT thermocouples.

## 16. Field Inspection Reports

HYDRO recently engaged vendors that have the Original Equipment Manufacturer (OEM) rights to the gas turbine sections in order to conduct detailed internal inspections of the individual sections and prepare field inspection reports complete with refurbishment estimates. The following is a list of OEM's and the corresponding sections of the gas turbine:

1. Rolls Wood Group has the OEM rights to the front end bearing assembly, compressor rotor, compressor casings, combustion assembly, nozzle casing, rear bearing housing, turbine assembly, exhaust unit, and accessories. They were recently contracted by HYDRO to conduct detailed internal inspections of the above noted equipment and have prepared a field inspection report complete with refurbishment estimates. HYDRO will make the field inspection report available to CONSULTANT.
2. Greenray Turbines (Lincoln) Limited has the OEM rights to the power turbine and gearbox. They were recently contracted by HYDRO to perform detailed internal inspections of the power turbine and the gearbox gears, bearings, and seals. HYDRO will make the field inspection report available to CONSULTANT.
3. Siemens has the OEM rights to 14.150 MW generator including the direct couple cooling fan, the 73.5 KW brushless AC exciter, the AC lube oil pump motor, the DC back-up lube pump motor, and the 25 HP outside fuel off loading pump motor. They were recently contracted by HYDRO to perform detailed internal inspections and testing of the above noted equipment. HYDRO will make the field inspection report available to CONSULTANT.
4. Braden Manufacturing is a company that specializes in the design and manufacturing of combustion turbine air filtration systems, air inlet systems, and exhaust systems. They were recently contracted by HYDRO to perform detailed inspections of the gas turbine air inlet plenum, air filtration system, air inlet plenum support structure, exhaust stack and exhaust stack support structure. HYDRO will make the field inspection report available to CONSULTANT.

All reports and information provided to PROPONENT/CONSULTANT by HYDRO remain the sole property of HYDRO and shall not be used for any purpose without the written consent of HYDRO.

The following drawings will be provided to CONSULTANT for information during the PROJECT:

<u>Drawing Description</u>	<u>Drwg No.</u>
Holyrood Generating Station – Stage 1 Gas Turbine Unit Relaying and Metering 3 Line A.C. Schematic	238 - 13 - 3000 - 003
Holyrood Generating Station Gas Turbine Unit – Cabinet No. 4 Control & Protection, Turbine & Generator Wiring Diagram (5 of 5)	238 - 13 - 3000 - 007
Holyrood Generating Station Gas Turbine – Cabinet No. 3 Termination Assembly Layout and Wiring Diagram (Sheet 4A of 5)	238 - 13 - 3000 - 007
Holyrood Generating Station Gas Turbine Unit - Cabinet No. 3 Control & Protection, Turbine & Generator (4 of 5)	238 - 13 - 3000 - 007

Holyrood Generating Station Gas Turbine - Cabinet No. 2 Termination Assembly Layout and Wiring Diagram (Sheet 3A of 5)	238 - 13 - 3000 - 007
Holyrood Generating Station Gas Turbine Unit - Cabinet No. 2 Control & Protection, Turbine & Generator Wiring Diagram (3 of 5)	238 - 13 - 3000 - 007
Holyrood Generating Station Gas Turbine - Cabinet No. 1 Termination Assembly Layout and Wiring Diagram (Sheet 2A of 5)	238 - 13 - 3000 - 007
Holyrood Generating Station Panel, Control & Protection, Turbine and Generator Cabinet No. 1 Wiring Diagram (Sheet 2 of 5)	238 - 13 - 3000 - 007
Holyrood Generating Station Gas Turbine - Cabinet No. 5 DCS Layout and Wiring Diagram (Sheet 7)	238 - 13 - 3000 - 007
Holyrood Generating Station Gas Turbine Unit Interconnections, Site Wiring Diagram (Sheet 1 of 3)	238 - 13 - 3000 - 008
Holyrood Generating Station Gas Turbine Unit Control & Protection Schematic Diagram (Sheet 1 of 6)	238- 13 - 3000 - 010
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Holyrood Generating Station Gas Turbine Unit  Control & Protection Schematic Diagram (Sheet 3 of 6)	238 - 13 - 3000 - 010
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Holyrood Generating Station Gas Turbine Unit Control & Protection Schematic Diagram (Sheet 6 of 6)	238 - 13 - 3000 - 010
Holyrood Gas Turbine Phasing Diagram	238 - 13 - 2000 - 016
Holyrood Generating Station Gas Turbine Station Services Panel No. 2 Wiring Diagram	238 - 13 - 2000 - 015

Holyrood Gas Turbine Exciter & A.V.R. Control Schematic Diagram	238 - 13 - 2000 - 014
Holyrood Gas Turbine Avon Start System Connection Diagram	238 - 13 - 2000 - 013
Holyrood Generating Station - Gas Turbine 575 Volt Motor Control 3 Phase A.C. Schematic	238 - 13 - 2000 - 012
Holyrood Generating Station - Gas Turbine 230 V, 3Ø, AC & 110V DC Auxiliaries Control Schematic	238 - 13 - 2000 - 011
Holyrood Generating Station - Gas Turb. 575 V, 3Ø, Station Service Supplies and Auto Transfer Switch Control Schematic	238 - 13 - 2000 - 010
NL and Labrador HYDRO Wiring Schedule (Sheets 1-28)	238 - 13 - 2000 - 017
Holyrood Generating Station Station Service Units 1 & 2, Gas Turbine 4160V Breakers Auxiliary Relay Schematic (Control)	238 - 13 - 0310 - 204
Holyrood Generating Station Gas Turbine Building Mechanical Equipment	238 - 08 - 2000 - 006
Holyrood Thermal Plant Gas Turbine Building Modifications to Generator Cooling Air Exhaust Dampers	238 - 08 - 2000 - 007
Holyrood Generating Station Gas Turbine Avon Vent Ducting	238 - 08 - 2000 - 008
Holyrood Gas Turbine Compressed Air System Single Line Diagram	238 - 08 - 2000 - 009
Holyrood Generating Station Gas Turbine Unit Junction Box, Assembly	238 - 13 - 3000 - 009
Arrangement of Air Piping For A.P.I. Gas Turbine (Sheet 1 of 3)	238 - 13 - 6010 - 015
Holyrood Generating Station Gas Turbine Unit Panel, Control and Protection, Turbine & Generator	238 - 13 - 3000 - 002
Holyrood Generating Station Gas Turbine Unit	238 - 13 - 3000 - 004

Junction Box, Pressure Switch, Assembly	
Holyrood Generating Station Gas Turbine Unit Junction Box, Assembly	238 - 13 - 3000 - 005
Holyrood Generating Station Gas Turbine Unit Junction Box, Assembly	238 - 13 - 3000 - 006
Gas Turbine Generator Transformer Outline	238 - 13 - 6030 - 007R2
Halon 1301 Fire Extinguishing System Layout, Turbine & Generator Rooms Holyrood Generating Station	238 - 13 - 3003 - 001
Fire Alarm/Halon Release Electrical Layout Holyrood Generating Station	238 - 13 - 3003 - 002
Fire Alarm/Halon Release Control Panel Wiring Diagram Holyrood Generating Station	238 - 13 - 3003 - 003
Holyrood Generating Station Gas Turbine Unit Interconnections, Site, Control System	238 - 13 - 3000 - 001
Holyrood Thermal Plant Gas Turbine Building Outline of Exhaust Gas Stack	238 - 08 - 2000 - 001
Holyrood Thermal Plant Gas Turbine Stack Support Steel (Original)	238 - 08 - 2000 - 003
Holyrood Thermal Plant Gas Turbine Building Mechanical Equipment Mounting Details	238 - 08 - 2000 - 004
Holyrood Generating Plant Proposed Building - Gas Turbine Floor Plan - (Electrical Equipment)	238 - 04 - 2000 - 001
Holyrood Thermal Plant Gas Turbine Building Volute Exhaust Flange	238 - 08 - 2000 - 002
Holyrood Generating Plant Proposed Building - Gas Turbine Elevations	238 - 04 - 2000 - 002
Holyrood Thermal Plant Gas Turbine Building Roof Plan and Elevations	238 - 04 - 2000 - 003
Holyrood Thermal Plant Gas Turbine Building Structural Steel Framing Plan	238 - 04 - 2000 - 005

Holyrood Thermal Plant Gas Turbine Building Foundation Plan & Details	238 - 04 - 2000 - 004
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Holyrood Thermal Plant Gas Turbine Building Miscellaneous Details	238 - 04 - 2000 - 008
Holyrood Generating Station Gas Turbine Fuel Totalizer	238 - 13 - 0310 - 019
Stack Cap (Snow Doors)	238 - 08 - 3001 - 001
Expansion Joint Fabric (Type C) Rectangular	238 - 08 - 3001 - 002
Holyrood Gas Turbine Single Line Diagram	238 - 13 - 2000 - 003
Holyrood Thermal Plant Gas Turbine Building Grounding Layout	238 - 13 - 2000 - 004
Holyrood Thermal Plant Gas Turbine Building Conduit Layout & Details	238 - 13 - 2000 - 005
Holyrood Gas Turbine Metering and Protection Single Line Diagram	238 - 13 - 2000 - 001
Holyrood Gas Turbine Rehabilitation Project Schedule	238 - 13 - 2000 - 006
Holyrood Thermal Plant Gas Turbine Building Lighting and Heating Layout	238 - 13 - 2000 - 007
Holyrood Generating Station 575 V, 3Ø, 230,115V, 1Ø & 110 V D.C. Dist. PNL.'s 575V, 3 Phase Light Oil Transfer Pump	238 - 13 - 2000 - 008
Holyrood Generating Station - Gas Turbine A.C. and D.C. Station Service Supplies Single Line	238 - 13 - 2000 - 009
Holyrood Gas Turbine A.P.I. Governing & Control System	238 - 13 - 6010 - 047
Arrangement of Air Piping for A.P.I. Gas Turbine (Sheet 2 of 3)	238 - 13 - 6010 - 015

Arrangement of Air Piping for A.P.I. Gas Turbine  
(Sheet 3 of 3)

238 - 13 - 6010 - 015

### 3. SCOPE OF SERVICES

The SERVICES which the CONSULTANT shall perform or cause to be performed with diligence, skill and care shall be as stated in Article 3 – Scope of SERVICES of the attached draft Agreement.

### 4. REMUNERATION

- .1 The PROPONENT must indicate the basis for the remuneration expected to complete the SERVICES. As a minimum, the PROPOSAL should:
  - (a) provide the calculations to be used to determine the hourly billing rates to cover "salary cost", "employee benefits", "general overheads" and profit for EMPLOYEES in both permanent office and temporary field assignments;
  - (b) provide the calculations to be used to determine the hourly billing rates for "overtime work" for both permanent office and temporary field EMPLOYEES;
  - (c) provide an outline of the PROPONENT's policies governing EMPLOYEES' entitlement to overtime pay; as a minimum, define its standard work week, indicate employee classifications entitled to overtime pay and related hourly billing rates, entitlements to overtime pay during after-hours travel time and approval of overtime work;
  - (d) identify the nature of expenses included in "general overheads" in the hourly billing rates referred to in (a) and (b) above;
  - (e) identify the nature of "reimbursable (out-of-pocket) costs" expected to be reasonably incurred and expended by the PROPONENT in the performance of the SERVICES, together with any administration fee, if applicable.
- .2 PROPONENT shall provide its proposed pricing to complete the SERVICES, which shall include the following minimum detail:
  - person-hours and associated cost for each job classification, including mark-ups for Employee Benefits, Overheads and profit. If applicable, include for field office(s)
  - reimbursable (out-of-pocket) costs by classification and location;
  - anticipated sub-consulting services by location; and
  - monthly cost flows for the proposed budget.

### 5. PROPONENT'S PROPOSAL

- .1 PROPONENT's PROPOSAL shall, as a minimum, include the following information:
  - (a) a listing of the PROPONENT's experience pertinent to the nature of the SERVICES, including applicable project descriptions, dates and clients' names and addresses;

- (b) details of the organizational structure and personnel proposed for performance of the SERVICES and such personnel shall not be changed by the CONSULTANT over the duration of the SERVICES without the prior written consent of HYDRO;
  - (c) curriculum vitae for all proposed management and professional personnel;
  - (d) an outline of the methodology intended for performance of the SERVICES; including as a minimum: key activities, involvement of proposed personnel, planned field investigative work and method of performance, intended design/project management office location(s), performance monitoring against proposed work schedule, person hours and cost (budget);
  - (e) two (2) schedules, in bar-chart format, one each for both key work activities and person-hours by classification;
  - (f) basis of remuneration, in the level of detail indicated elsewhere herein;
  - (g) proposed procedures for monitoring and controlling costs;
  - (h) subject to the provisions of Clause 12.2 of this RFP, identification of any proposed changes to the draft Form of Agreement; and
  - (i) acknowledgement that the accuracy of the cost estimate included in the PROJECT REPORT shall be within an accuracy range of plus or minus 10%.
- .2 All costs associated with PROPOSAL preparation, including but not limited to matters such as PROPOSAL development, investigations, site visits, clarification and other meetings shall be the responsibility of and borne solely by the PROPONENT, and shall not be subject to any reimbursement by HYDRO.

## 6. SUBMISSION OF PROPOSALS

- .1 One (1) original and two (2) copies of the PROPOSAL shall be submitted to HYDRO before 3:00 p.m., local time on April 4<sup>th</sup>, 2011 at the following address:
- Supply Chain Management Department  
Newfoundland and Labrador HYDROIBILITY  
500 Columbus Drive  
P.O. Box 12400  
St. John's, Newfoundland and Labrador  
A1B 4K7
- ATTENTION: MANAGER OF SUPPLY CHAIN MANAGEMENT  
RFP for Level 2 Condition Assessment & Life Extension Study - Gas Turbine Generator
- .2 During the PROPOSAL preparation period, PROPONENT may seek written clarification on PROPOSAL requirements by contacting: Mr. Ashley Billard, Tel #: 709 737 4643, Fax #: 709 737 1795, and email: [abillard@nlh.nl.ca](mailto:abillard@nlh.nl.ca) not less than seven (7) days prior to the date for PROPOSAL submission stipulated in clause 6.1
- .3 HYDRO shall not be responsible for oral instructions or clarifications and no instructions or clarifications shall be binding unless communicated by HYDRO in writing.

## 7. VALIDITY PERIOD

Each PROPOSAL shall remain open for acceptance and irrevocable for a period of ninety (90) days after the deadline for receipt of Proposals.



## 8. CONSULTANT'S REGISTRATION REQUIREMENTS

- .1 The CONSULTANT shall be authorized to do business in the Province of Newfoundland and Labrador prior to performance of the SERVICES. Where the CONSULTANT is a corporation, it shall be registered to carry on business in compliance with the laws of the Province of Newfoundland and Labrador and shall be registered in good standing with the Registry of Companies of Newfoundland and Labrador.
- .2 The CONSULTANT shall be authorized to engage in the practice of engineering in the Province of Newfoundland and Labrador in accordance with the requirements of the Engineers and Geoscientists Act, RSNL 1990, Chapter E-12, as amended, prior to performance of the SERVICES. If required by HYDRO, the CONSULTANT shall provide evidence satisfactory to HYDRO to this effect.

## 9. CONFIDENTIALITY AND ACCESS TO INFORMATION

- .1 The PROPONENT/CONSULTANT shall exert its best efforts to retain as confidential and not divulge, other than to persons specifically designated and approved by HYDRO, environmental, financial, technical or schedule information or any additional information designated as confidential by HYDRO that was furnished to the PROPONENT/CONSULTANT by HYDRO or was acquired by the PROPONENT/CONSULTANT in the preparation and submission of any Report. The PROPONENT/CONSULTANT shall treat all such information as confidential and the foregoing shall not apply to information and data which:
  - (a) were in the CONSULTANT's possession or was previously known by the CONSULTANT prior to submission of its PROPOSAL in response to this RFP; or
  - (b) becomes known or published through some agency other than the PROPONENT/CONSULTANT from third parties not connected with the PROJECT or with the performance of the SERVICES; or
  - (c) becomes part of the public domain through no fault of the PROPONENT/CONSULTANT.
- .2 HYDRO is subject to the Access to Information and Protection of Privacy Act, Statutes of Newfoundland and Labrador, 2002 Chapter A-1.1 (hereinafter referred to as the "ATIPP Act"), and consequently the public has a right of access to HYDRO's records.
- .3 Although section 27 of the ATIPP Act provides an exception which may sometimes be enforceable when access to information relating to a third party is requested, there may be instances when HYDRO is required to provide a member of the public with access to such information.
- .4 HYDRO shall not be liable for any claims, costs, losses or damages experienced by a PROPONENT/CONSULTANT as a result of HYDRO's release of information to another party pursuant to the provisions of the ATIPP Act. The PROPONENT should familiarize itself with the provisions of the ATIPP Act.

## 10. INSURANCE

- .1 The CONSULTANT shall comply with Article 16 – Insurance of Design and PROJECT Management Agreement.
- .2 **Certificate of Insurance** - Prior to commencing the performance of any part of the SERVICES, and at any time upon the request of HYDRO, CONSULTANT shall give HYDRO a completed Certificate of Insurance.

## 11. CONFLICT OF INTEREST

PROPONENT must disclose in its Proposal any potential conflict of interest. If a conflict of interest does exist, HYDRO may, at its discretion, refuse to consider the Proposal. If during the Proposal evaluation process or the negotiation of an Agreement, the PROPONENT is retained by another client giving rise to a potential conflict of interest, then the PROPONENT will refuse the new assignment or will take such steps as are necessary to remove the conflict of interest.

## 12. EVALUATION OF PROPOSALS

- .1 Proposals will be evaluated on the basis of key considerations noted in Table 12.1, which include, but are not limited to, the following considerations:
- (a) all relevant legal and financial considerations;
  - (b) capability of PROPONENT, based on the relevant experience of the PROPONENT and the personnel to be assigned to the SERVICES;
  - (c) technical adequacy of the PROPOSAL including appreciation of the scope of the SERVICES and proposed methodology to undertake the study; and
  - (d) basis of remuneration and the proposed cost estimate for performance of the SERVICES.

<b>TABLE 12.1 EVALUATION CRITERIA</b>		
<b>ITEM</b>	<b>KEY CONSIDERATIONS</b>	<b>MAXIMUM POINTS</b>
<b>1</b>	<b>UNDERSTANDING OF SCOPE OF WORK</b>	
1.1	Recognition of Scope and Objectives	5
1.2	Compliance with RFP	10
1.3	Methodology	10
1.4	Innovation	5
	Sub-Total	30
<b>2</b>	<b>CONSULTANT'S CAPABILITY AND EXPERIENCE</b>	
2.1	Experience in Similar Work	15
2.2	Project Team (Organization and Experience)	10
2.3	Location of Office(s)	10
2.4	Familiarity with Project Environment	20
	Sub-Total	55
<b>3</b>	<b>PROPOSED ALLOCATION OF PERSON-HOURS AND EXPENDITURES</b>	5
<b>4</b>	<b>COST OF SERVICE</b>	5
<b>5</b>	<b>QUALITY OF PRESENTATION</b>	5

	TOTAL POINTS	100
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- .2 The successful PROPONENT shall be required to enter into an appropriate agreement, generally in the form of the draft Agreement included with this RFP, with HYDRO for the performance of the SERVICES specified in this RFP.
- .3 HYDRO reserves the right to accept or reject any or all proposals or portions thereof, as well as the right to negotiate with one or more consultants to finalize the form and substance of the contract. After negotiations are concluded with the successful CONSULTANT, all other consultants will be notified of the award of the contract in writing.

### 13. PROJECT REPORT

- .1 Upon completion of the study the CONSULTANT shall provide HYDRO with eight (8) copies of the draft PROJECT REPORT for its review and comments. The submission shall be complemented by a presentation in which the key aspects of the study, the conclusions reached and recommendations made can be discussed. In any event, HYDRO's comments on the draft PROJECT REPORT will be conveyed to the CONSULTANT within two (2) weeks of its receipt by HYDRO.

Following review of the draft PROJECT REPORT with HYDRO, as provided for herein, the CONSULTANT shall finalize its PROJECT REPORT and present HYDRO with eight (8) copies. As a minimum, the draft and final PROJECT REPORTs shall address all activities undertaken by the CONSULTANT in the performance of the SERVICES, including the following:

- (a) background information and studies used;
  - (b) the scope and results of field investigative work, analyses undertaken, layouts considered, variables examined, operational considerations, study results, and all other optimization factors;
  - (c) scope and cost estimates prepared by HYDRO as provided for elsewhere herein;
  - (d) key features and parameters of the PROJECT;
  - (e) a cost estimate and construction schedule for the recommended refurbishment tasks associated with the gas turbine generator and balance of plant systems as indicated in the PROJECT layout, including quarterly cost and cash flows;
  - (f) the assumptions made and basis used during preparation of the cost estimate for PROJECT development;
  - (g) confirmation that the cost estimate, inclusive of contingency amounts, for PROJECT development included in the PROJECT REPORT is within an accuracy range of not more than plus or minus 10%;
  - (h) any key considerations pertinent to protection of the PROJECT Cost Estimate and construction schedule envisaged in the PROJECT REPORT; and
- .2 All design files, calculations including computerised data and design files, original drawings, test results, survey and site investigation information, air photos, and other data produced during performance of the SERVICES shall become the property of HYDRO on completion of the SERVICES.
  - .3 The contents of the PROJECT REPORT shall be kept confidential and shall not be released to third parties without HYDRO's prior written permission.

### 14. CLARIFICATION MEETING

If required by HYDRO before a Proposal is accepted, PROPONENT shall, at its cost, attend a Clarification Meeting to review the RFP or its PROPOSAL, and such Meeting shall be held at HYDRO 's offices.

## **15. CERTIFICATE OF RECOGNITION SAFETY PROGRAM**

Where CONSULTANT will be managing contracts involving site work, CONSULTANT shall provide proof of completion by its field Managers and Supervisors of the Leadership for Safety Excellence component of the Certificate of Recognition Safety Program of the Newfoundland and Labrador Construction Safety Association (NLCSA). Prior to commencing such site work, CONSULTANT shall obtain and deliver such proof or proof of completion of a similar safety program component to HYDRO.

## **16. WORKERS' COMPENSATION**

- .1 Contractor shall pay all assessments due under relevant Workers' Compensation Acts. Prior to commencing performance of the Work, Contractor shall obtain and deliver to Owner a certificate or certificates establishing that it is in good standing with the Work Place Health, Safety and Compensation Commission of Newfoundland and Labrador and with the comparable board or commission of any other province having jurisdiction in connection with Contractor's performance of the Work.
- .2 Contractor shall produce a satisfactory certificate showing clearance of all indebtedness under relevant Workers' Compensation Acts prior to release of the holdback retained under the Contract.

## **17. ENVIRONMENTAL AWARENESS PROGRAM**

Where CONSULTANT will be managing contracts involving site work, HYDRO endorses the Environmental Awareness Program of the Newfoundland and Labrador Construction Safety Association. CONSULTANT shall provide proof of completion, by its Supervisors and Managers, of this Environmental Awareness Program or a similar program acceptable to HYDRO. Proof shall be provided prior to the commencement of Work.

## **18. LANGUAGE OF CONTRACT**

Documentation, required submittals and all other communications, whether verbal or written, shall be in English.

**DRAFT**  
**AGREEMENT**

**FOR**

**DESIGN AND PROJECT MANAGEMENT SERVICES**

**FOR**

**LEVEL 2 CONDITION ASSESSMENT & LIFE EXTENSION STUDY**

**GAS TURBINE GENERATOR AND BALANCE OF PLANT**

**HOLYROOD THERMAL GENERATING STATION**

**BETWEEN**

**NEWFOUNDLAND AND LABRADOR HYDRO**

**AND**

**SUCCESSFUL CONSULTANT**

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**THIS AGREEMENT** made at St. John's in the Province of Newfoundland and Labrador as of the \_\_\_\_\_ day of \_\_\_\_\_ A.D. 20\_\_.

**BETWEEN** **NEWFOUNDLAND AND LABRADOR HYDRO**, a body corporate existing pursuant to the HYDRO Corporation Act, RSNL 1990 Chapter H-16 and having its head office at St. John's, in the Province of Newfoundland and Labrador, (hereinafter referred to as "HYDRO") of the first part

**AND** **SUCCESSFUL CONSULTANT**, a body incorporated under the laws of the Province of \_\_\_\_\_ and having its head office in the City of \_\_\_\_\_ in the Province of \_\_\_\_\_ (hereinafter referred to as "CONSULTANT") of the second part

**WHEREAS** HYDRO proposes to undertake the completion of a study and preparation of a report titled: *Level 2 Condition Assessment And Life Extension Study – Gas Turbine Generator And Balance Of Plant* (hereinafter referred to as the "PROJECT");

**AND WHEREAS** HYDRO has agreed to retain CONSULTANT to perform the condition assessment and life extension study for the PROJECT on the terms and conditions hereinafter set out;

**NOW THEREFORE THIS AGREEMENT WITNESSETH** that in consideration of the covenants, agreements, terms, conditions and payments hereinafter set forth, the parties hereto hereby respectively covenant and agree as follows:

## **1. DEFINITIONS**

Unless the context otherwise requires, the following definitions shall apply to this Agreement.

1.1 **CONTRACT** shall mean this Agreement and includes:

- (i) Letter of Award dated \_\_\_\_\_;
- (ii) Minutes of Pre-Award Meeting of \_\_\_\_\_;
- (iii) PROPOSAL; and
- (iv) RFP.

In case of conflict, the said documents are listed in order of precedence, unless otherwise provided.

1.2 **CONTRACTORS** shall mean those persons or companies who have a contract with HYDRO for the performance of any work in connection with the PROJECT.

1.3 **EMPLOYEES** shall mean employees or agents of CONSULTANT and of its affiliated and subsidiary companies.

1.4 **PROJECT REPORT** shall mean and includes:



- (i) Project\_Name, Final PROJECT Study, dated final PROJECT date;
  
- 1.5 FINAL ACCEPTANCE shall mean final acceptance of the SERVICES as provided under Article 9.
  
- 1.6 JOBSITE means the lands and other places in the Province where the PROJECT is located.
  
- 1.7 PROPOSAL shall mean the proposal submitted by CONSULTANT dated proposal date;
  
- 1.8 RFP shall mean the Request for Proposals to complete an engineering study and prepare a report for a Level 2 Condition Assessment and Life Extension Study – Gas Turbine Generator and Balance of Plant (RFP # 2011 - 46874) issued on March 16<sup>th</sup>, 2011.
  
- 1.9 SERVICES means those SERVICES to be provided as stated in Article 3 – SCOPE OF SERVICES.
  
- 1.10 The PROJECT will include all of the investigative work, including site visits and provision of sub-consultants and outside specialist assistance as CONSULTANT deems necessary, to complete the Level 2 Condition Assessment and Life Extension Study of the Gas Turbine Generator and Balance of Plant located at the HTGS.

## **2. INTERPRETATION**

- 2.1 The doctrine of contra proferentem shall not apply in the interpretation of this document(s) meaning that if there is any ambiguous language in this document it shall not be interpreted more strongly against the party who prepared or drafted the ambiguous language.
  
- 2.2 The words "include", "includes" and "including" as used in the CONTRACT are not to be construed as words of limitation.
  
- 2.3 Article headings are inserted herein for convenience of reference only and shall not form a part hereof for purposes of interpretation.
  
- 2.4 In the CONTRACT, all references to dollar amounts and all references to any other money amounts are expressed in terms of currency of Canada.
  
- 2.5 Wherever, in the CONTRACT, a number of days is prescribed for any purpose, unless otherwise specified, the days shall be calendar days and shall be reckoned exclusively of the first and inclusively of the last.

- 2.6 The rights and recourse of HYDRO and CONSULTANT contained in the CONTRACT are cumulative and not in the alternative unless otherwise provided. The exercise of any such rights or recourse shall not constitute a waiver or renunciation of any other rights or recourse.

### **3. SCOPE OF SERVICES**

#### **3.1 PROJECT MANAGEMENT APPROACH**

HYDRO's objective is to complete the PROJECT within its approved cost estimate and schedule as defined in Clause 3.6. CONSULTANT shall be familiar with and implement, where applicable, HYDRO's Project Management Manual with respect to all aspects of the PROJECT.

Further, to identify and reduce potential risk areas, additional field investigations shall be undertaken by CONSULTANT during the period from March 16<sup>th</sup>, 2011 to April 29<sup>th</sup>, 2011. This will also enable the engineering study and report to be completed as accurately as possible.

#### **3.2 SERVICES**

CONSULTANT is an independent contractor and not an agent or employee of HYDRO.

CONSULTANT acknowledges that HYDRO is relying on the skill and knowledge of CONSULTANT in performing the SERVICES. CONSULTANT shall exercise the degree of skill, care and diligence required by customarily accepted practices and procedures normally provided in performance of services similar to the SERVICES required under the Contract.

CONSULTANT shall only use key personnel to perform the SERVICES who have been named by CONSULTANT in the PROPOSAL and who have been accepted by HYDRO. CONSULTANT may only substitute or replace the accepted key personnel with the prior written agreement of HYDRO.

The scope of work for the PROJECT consists of an engineering study that will assess the condition of the HTGS gas turbine and balance of plant and make recommendations for work including cost estimates that will be required to extend its useful life to 2020 with the same high degree of reliability as that experienced in the past. The engineering study will include a Level 2 study as per the guidelines of the Electrical Power Research Institute (EPRI). During the 1970's and 1980's, EPRI developed a three-level methodology for performing condition assessment and life extension studies within the utilities industry in which the level of sophistication and detail increases progressively through Level I, Level II, and Level III studies. CONSULTANT shall apply this process to the gas turbine generator and balance of plant equipment. Although HYDRO has referenced EPRI guidelines for completing this part of the study, CONSULTANT is invited to put forth other methodologies for HYDRO's consideration.

In addition, the PROJECT shall include an engineering study including cost estimates to replace the existing gas turbine plant with a new or good condition used mobile generating plant.

The PROJECT shall be based on the following assumptions:

- The HTGS gas turbine and balance of plant will be required to continue operating as a black start unit for the plant until the generation end date of 2020;
- The HTGS gas turbine and balance of plant will occasionally provide support to the Island Interconnected Grid system until 2020.

The scope of work to be performed by CONSULTANT during the PROJECT shall include but not be limited to the following:

1. Review Equipment Inspection Records:

HYDRO recently engaged vendors that have the Original Equipment Manufacturer (OEM) rights to the gas turbine sections in order to conduct detailed internal inspections and prepare field inspection reports complete with refurbishment estimates. The following is a list of OEM's and the corresponding sections of the gas turbine:

**Rolls Wood Group:**

1. Gas turbine:
  - a. Bearing assemblies;
  - b. High pressure compressor rotor and casing;
  - c. Low pressure compressor rotor and casings;
  - d. Combustion chamber assembly;
  - e. Nozzle case;
  - f. Turbine assembly;
  - g. Exhaust assembly;
  - h. Couplings;
  - i. AC lube oil pump
  - j. DC back-up lube oil pump

**Greenray:**

2. Power turbine
3. Gearbox:
  - a. Gears;
  - b. Bearings;
  - c. Seals;
  - d. Casing; and
  - e. Couplings

**Siemens:**

4. Generator:
  - a. Rotor windings;
  - b. Stator windings;
  - c. Bearing assemblies;
  - d. Brushless AC Exciter; and
  - e. Casing

**Braden Manufacturing:**

5. Inlet air system
  - a. Air filtration system
  - b. Plenum
  - c. Structure
  - d. Louvers
6. Exhaust air system
  - a. Plenum
  - b. Structure
  - c. Louvers

HYRDO will make the OEM field inspection reports available to CONSULTANT. Following an analysis of the field inspection reports and consultation with OEMs, CONSULTANT shall make recommendations for refurbishment work complete with cost estimates, including a schedule, that is required to extend the life of the gas turbine generator until the year 2020. CONSULTANT's proposal shall identify cost to complete this work.

**2. Conduct Equipment Inspections – Balance of Plant**

CONSULTANT shall develop a plan, including a schedule, to perform detailed Level 2 inspections of the remaining gas turbine balance of plant systems and subsystems and document any defects. Following the completion of Level 2 inspections, CONSULTANT shall make recommendations for refurbishment work complete with cost estimates, including a schedule, that are required to extend the life of the balance of plant systems until the year 2020. OEMs and other specialists shall be consulted if considered to be beneficial to the condition assessment and eventual analysis. CONSULTANT shall contact OEMs and other specialists to provide this information to CONSULTANT. In addition, the cost to complete all recommended work shall be identified in CONSULTANT's proposal.

The remaining gas turbine balance of plant systems and subsystems that require a Level 2 condition assessment and life extension study shall include but not be limited to the following:

1. Fuel oil system:
  - i. Fuel tanks;
  - ii. Fuel oil piping;
  - iii. Fuel offloading pumps;
  - iv. Valves;
  - v. Fuel supply pumps (to the gas turbine);
  - vi. Strainers and filters;
  - vii. Fuel flow meter; and
  - viii. Fire system trip valve
2. Electrical and controls
  - i. Foxboro DCS system
  - ii. DCS logic
  - iii. MCC
  - iv. Switchgear
  - v. Governor system
  - vi. Battery room
3. Compressed air system
  - i. Compressor unit
  - ii. Instrument air dryer
  - iii. Control panel
  - iv. Nitrogen back-up bottle supply
4. Building
  - i. Structure
  - ii. Fire protection system
  - iii. Crane hoist and track system

### 3. Major Upgrades and Repairs

A number of major upgrades and repairs have been performed on the HTGS gas turbine and balance of plant since it went into service in 1986. CONSULTANT shall obtain and review plant records pertaining to equipment major upgrades and repairs and then evaluate their impact on the remaining equipment useful life.

### 4. Determine Remaining Equipment Life

CONSULTANT shall provide and execute a plan to estimate the remaining service life of the HTGS gas turbine generator and balance of plant. It is anticipated that this will require consultation with OEMs and a review of historical life cycle information for similar type facilities in order to determine the industry trend. CONSULTANT shall contact OEMs and other specialists to provide this information to CONSULTANT. CONSULTANT's proposal shall identify cost to complete this work.

5. Determine Annual Operating and Maintenance Cost

Following completion of the recommended refurbishment tasks, CONSULTANT shall determine the annual operating and maintenance (O&M) cost for the gas turbine and balance of plant up to and including the year 2020. In addition, CONSULTANT shall estimate the annual O&M cost up to and including the year 2020 without completing the recommended refurbishment work. CONSULTANT shall contact OEMs and other specialists as necessary to provide this information to CONSULTANT. HYDRO will provide the existing maintenance strategy program for the gas turbine.

6. Replace Existing Gas Turbine Plant

CONSULTANT shall perform an engineering study to determine the scope of work including cost estimates required to replace the existing HTGS gas turbine generator and balance of plant with a new or good condition used mobile generating plant considering the alternative arrangements noted below:

- a. A gas turbine plant consisting of two (2) 5 MW mobile units
- b. A diesel generating plant consisting of five (5) 2 MW diesel units

The alternative arrangements are to be configured in manner such that uninterrupted black start power availability would be provided to the HTGS until they are commissioned and be capable of providing start-up block loads up to 3 MW in a smooth and stable fashion.

Cost estimates shall include decommissioning of the existing plant and removing it from site.

CONSULTANT shall determine the annual O&M cost for each alternative up to and including the year 2020.

CONSULTANT shall provide all project related information in electronic formats acceptable to HYDRO.

### 3.3 FINAL REPORT

Before submitting the final report, CONSULTANT shall submit a draft report outlining the results of the PROJECT. The report shall include but not be limited to the following:

- a) An "Executive Summary" outlining the findings of the HTGS gas turbine and balance of plant Level 2 condition assessment and life extension study, including the results of the engineering study to replace the existing gas turbine and balance of plant with a new or good condition mobile generating plant;
- b) An "Introduction" providing historical background information on the HTGS gas turbine that shall include a general discussion on the gas turbine components and balance of plant, a discussion on the plant's historic mode of operation, and reliability issues. The "Introduction" shall also provide commentary on the operating scenario for the gas turbine based on the assumptions stated in Section 3.2.

- c) A discussion on the methodology utilized to determine component, equipment, system, and the entire gas turbine plant remaining useful life.
- d) A summary of the results of the plant equipment record reviews.
- e) A summary of the results of the Level 2 condition assessment and life extension study based on the gas turbine OEM field inspection reports provided by HYDRO and the balance of plant inspections provided by CONSULTANT. The summary of results shall be displayed in a table format and
- f) shall also include equipment, system, and entire plant remaining useful life. In addition, CONSULTANT shall include any supporting correspondence from discussions with OEMs and specialists used during the time of equipment inspections;
- g) A summary of the recommended gas turbine and balance of plant refurbishment tasks including associated cost and recommended schedule.
- h) A summary of the annual operating and maintenance cost for the gas turbine and balance of plant systems up to and including the year 2020, following completion of the recommended refurbishment tasks.
- i) A summary of the annual operating and maintenance cost for the gas turbine and balance of plant systems up to and including the year 2020, without completion of the recommended refurbishment tasks.
- j) Identification of components or systems that require immediate remedial attention arising from the investigative and analysis work performed to date;
- k) A summary of the engineering study to replace the existing gas turbine and balance of plant with a new or used mobile generating plant, including alternatives considered, cost estimates, and annual O&M for each alternative up to and including the year 2020.
- l) A conclusion and recommendations section.

Following a review with HYDRO of the draft report CONSULTANT shall make adjustments as agreed to with HYDRO and submit the final report.

3.4 In the performance of the SERVICES, CONSULTANT shall at all times:

- (a) be subject to the direction and control of HYDRO;
- (b) be the sole agent of HYDRO in dealing with third parties in relation to the performance of the work and CONSULTANT shall be identified as such in writing in all contracts entered into by or on behalf of HYDRO for the purchase of materials and equipment and for the performance of construction and other services under such contracts;
- (c) use only competent and skilled personnel and, upon request of HYDRO and subject to any applicable laws and any collective agreement, cease to use any personnel to whom HYDRO takes objection; and

- (d) complete the PROJECT for the most economical cost consistent with accepted practice, reliability, and reasonably maintenance-free operation, subject to the governing considerations of Clause 3.6.
- 3.5 (a) HYDRO reserves the right, at its discretion, at any time, to appoint a representative solely responsible to HYDRO for the administration of the CONTRACT and, in that event, the relations between HYDRO's representative and CONSULTANT shall be governed by the terms and conditions of this CONTRACT;
- (b) Nothing in this CONTRACT shall be construed as limiting the right of HYDRO to employ directly other advisors, experts, consultants, agents, and specialists to provide HYDRO with independent advice in relation to any part of the PROJECT or the SERVICES.
- 3.6 Time is of the essence. The CONSULTANT shall perform the SERVICES requested herein in accordance with the following schedule:

**Schedule**

<b><u>Event</u></b>	<b><u>Scheduled Completion Date</u></b>
Letter of Award.....	April 12 <sup>th</sup> , 2011
Execute agreement.....	April 19 <sup>th</sup> , 2011
Site visit investigations .....	May 13 <sup>th</sup> , 2011
Draft report submission .....	June 10 <sup>th</sup> , 2011
Final report submission .....	July 4 <sup>th</sup> , 2011
Completion of SERVICES.....	July 15 <sup>th</sup> , 2011

CONSULTANT shall perform each component of the SERVICES in accordance with the schedule agreed upon by CONSULTANT and HYDRO to meet the completion dates specified under the Contract.

Where, after consultation with CONSULTANT, HYDRO decides that the rate of progress of the SERVICES is insufficient to enable the SERVICES to be completed in the manner specified in the Contract and within the agreed schedule, CONSULTANT shall take whatever steps that HYDRO requires, in writing, to expedite the progress of the SERVICES to meet the completion dates and schedule in the Contract.

- 3.7 Without restricting the generality of the foregoing, CONSULTANT may, with the prior written approval of HYDRO, subcontract portions of the SERVICES.



- 3.8 CONSULTANT agrees and confirms that the accuracy of the all-inclusive cost estimate included in the PROJECT REPORT is within an accuracy range of plus or minus 10%.
- 3.9 CONSULTANT agrees and confirms that the accuracy of the all-inclusive cost estimate for provision of the SERVICES as provided within the PROPOSAL is within an accuracy range of plus or minus 10%.
- 3.10 CONSULTANT warrants that it shall perform the SERVICES in accordance with the standard of care, skill and diligence appropriate at the time of performance expected of recognized professional firms performing services of a similar type and nature. CONSULTANT shall, at no additional cost to HYDRO, re-perform those SERVICES which fail to meet such standard.

#### **4. APPROVALS BY HYDRO**

- 4.1 HYDRO has the right to specify, from time to time with reasonable notice, those elements of the SERVICES which will require review and approval of HYDRO and such approvals, where required, shall not be unreasonably withheld.
- 4.2 CONSULTANT shall prepare and submit to HYDRO for consideration and approval a plan of operating procedures which shall specify those items or classes of items to be submitted by CONSULTANT to HYDRO for approval, and the manner and time of submission and approval, including such items as conceptual design, general specifications, design criteria, contracts, subcontracts, procurement commitments, schedules, cost budgets, code of accounts, reports and the like.
- 4.3 An approval given by HYDRO shall not be deemed, in any way, to relieve CONSULTANT of its responsibilities for the elements of the SERVICES in respect of which such approval is given nor to diminish such responsibilities, except as may otherwise be agreed in writing.

#### **5. REMUNERATION**

- 5.1 HYDRO shall pay CONSULTANT for the SERVICES a total remuneration consisting of payment for hours worked and Reimbursable (out of pocket) Costs, all in accordance with this Article. Harmonized Sales Tax (HST), where applicable, shall be paid in addition to such remuneration.

##### **5.2 HOURLY COSTS**

CONSULTANT shall be reimbursed by HYDRO for the time spent by CONSULTANT's personnel in connection with the performance of the SERVICES at the hourly rates indicated below, which are deemed to include components for salary, EMPLOYEE benefits, general overhead costs and profit of all SERVICES as defined in this CONTRACT.

The hourly billing rates are calculated as follows:

Staff Description	Base Salary \$/hr	Multipliers for Payroll, Overhead Costs and Profit			Hourly Billing Rate
		Payroll	Overhead	Profit	
	"S"	"P"	"O"	"T"	(S x P x O x T)
Office or Short-term Field Staff					
Long-term Field Staff					
Temporary Field Staff (labourers, survey crew, etc.)					

"Payroll" Costs comprise an allowance for fringe benefits, which include workers' compensation, employment insurance, health and hospital insurance, salary continuation insurance, group life insurance, pensions, paid vacation time, sick leave, and other such benefits as required by law.

"Overhead" Costs comprise all office costs including rental, heating and lighting, telephone, fax, furniture, equipment and corporate support services.

The hourly billing rates of CONSULTANT for the year and CONSULTANT's estimated person-hours are as follows. Any increase in the hourly billing rate will be made based on the actual average increase in the hourly billing rate of the PROJECT team, but shall not exceed 5% per annum.

NAME	CLASSIFICATION	PERSON-HOURS	Year HOURLY BILLING RATES (\$)
	PROJECT Manager		
	Design Manager		
	Construction Manager		

### 5.3 REIMBURSABLE COSTS

The out-of-pocket expenses incurred by CONSULTANT in performance of the SERVICES will be reimbursed by HYDRO at cost, together with any administration fee, if applicable, and shall include such

items as investigations, surveys, travel and accommodations, long distance communications, and drawings and tender/contract documents reproduction costs. CONSULTANT's estimated out-of-pocket costs are as follows:

<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QTY.</b>	<b>RATE (\$)</b>	<b>AMOUNT (\$)</b>
1.	Investigation Program (see breakdown of costs in PROPOSAL)	LS	-		
2.	Travel and Transportation	LS	-		
3.	Board and lodging: - short-term staff per diem - relocated staff rental allowance - relocated staff per diem	Days Mths. Days			
4.	Communication and reproduction costs	Mths.			
5.	PROJECT Accounting and Management System	LS	-		
<b>TOTAL</b>					

#### 5.4 FAILURE TO MEET SCHEDULE

CONSULTANT shall make every effort to achieve the PROJECT completion date. Should CONSULTANT not complete the PROJECT or SERVICES as scheduled and provided that the failure is not the result of events or circumstances outside CONSULTANT's control and there has not been an authorized change in scope, HYDRO will discount the amount payable to the consultant as follows:

When the cost estimate provided by the CONSULTANT has been reached, the hourly rate for billable hours after that time will be discounted by 10%.

## 6. CHANGES AND EXTRA WORK

6.1 HYDRO shall have the right to require:

- (a) changes in the PROJECT and in the work supervised by CONSULTANT;
- (b) extra work or SERVICES to be performed by CONSULTANT in addition to the said SERVICES;
- (c) a reduction in the SERVICES;

or

(d) any combination of the things referred to in paragraphs (a), (b) or (c).

- 6.2 If, at any time, HYDRO requires changes or extra work to be made in the scope of the PROJECT, CONSULTANT shall prepare and furnish to HYDRO, for its approval, a written estimate of the increase or decrease in the cost of SERVICES, or in the time of completion of the SERVICES or the PROJECT, or both, if such changes were to be effected, all in accordance with procedures approved by HYDRO. Rates, overhead and profit shall not exceed those provided for in Clause 5.2, and where such changes or extra work involve classifications not provided in Clause 5.2 such classification rates shall be mutually agreed and calculated in a similar manner as existing classifications. If HYDRO then desires to have the changes or extra work effected by CONSULTANT, it shall notify CONSULTANT thereof in writing and CONSULTANT shall thereupon revise the applicable PROJECT and SERVICES cost estimates.
- 6.3 CONSULTANT shall be conclusively deemed to have accepted the decision of HYDRO on compensation payable for changes or extra work unless CONSULTANT provides HYDRO with written notice within fourteen (14) days disputing HYDRO's decision.

## **7. DELAY**

- 7.1 Where either party is aware of an event or any circumstances which are delaying or are expected to delay the performance of the SERVICES, that party shall give written notice to the other party of the particulars of the cause and the expected length of the delay and the steps that the party intends to take to mitigate the effects of the delay.
- 7.2 The written notice shall be given as soon as possible and in any event not later than seven (7) days after the party becomes aware or ought reasonably to have become aware of the commencement of the event or circumstances causing the delay.
- 7.3 Where the SERVICES or a component of the SERVICES are delayed as a result of any act or failure to act under the contract by a party, its agents or employees, beyond a time required under the Contract, the other party may request an equitable adjustment within twenty eight (28) days of the required time.
- 7.4 Both parties shall make every reasonable effort to mitigate the effects of or overcome any delay of the SERVICES.
- 7.5 CONSULTANT shall be conclusively deemed to have accepted the decision of HYDRO on compensation payable for delay unless CONSULTANT provides HYDRO with written notice within fourteen (14) days disputing HYDRO's decision.

## **8. MANNER AND TIME OF PAYMENT**

- 8.1 As soon as practicable after the end of each calendar month, and in any case not later than the twentieth day of the following calendar month, CONSULTANT shall submit to HYDRO an invoice for the remuneration due for the SERVICES rendered during the previous calendar month, including the expenditures actually incurred and paid in accordance with the provisions of the CONTRACT during that month and being Reimbursable Costs, prepared in accordance with Article 5 - Remuneration in such form and supported by such time sheets, payroll journals, receipted supplier invoices and such proof of expenditures, as HYDRO shall require.
- 8.2 Within thirty (30) calendar days after receipt of such invoice, HYDRO shall, after any appropriate adjustments and subject always to possible further verification and correction, pay CONSULTANT for such monthly invoices.
- 8.3 Following completion of the construction of the PROJECT, CONSULTANT shall submit to HYDRO detailed statements accounting for total Reimbursable Costs in formats to be approved by HYDRO and shall execute a Release from All Liabilities in a form acceptable to HYDRO. Within sixty (60) days after receipt thereof, HYDRO will pay to CONSULTANT the total amount of Reimbursable Costs less the amount of any items in dispute and less amounts previously paid by HYDRO to CONSULTANT on account thereof or if amounts previously paid to CONSULTANT exceed the total amount of Reimbursable Costs, CONSULTANT shall repay such excess to HYDRO and all such Reimbursable Costs shall be determined in accordance with Article 5 - Remuneration.
- 8.4 The acceptance by CONSULTANT of the final payment under the CONTRACT shall operate as, and shall be, a release to HYDRO and its agents from any and all claims of and liability to CONSULTANT for anything done or furnished for, or in relation to, the CONTRACT or the PROJECT, or for any act of neglect or omission of HYDRO and its agents relating to or affecting the CONTRACT or the PROJECT, except claims that have been identified and remain unsettled.
- 8.5 Delay by HYDRO in making a payment when it becomes due and payable shall not be deemed to be a breach of the CONTRACT by HYDRO, but, except where specifically otherwise provided for, such a delay will, if the delay continues for more than fifteen (15) days beyond the date upon which the payment is due and payable, entitle CONSULTANT to interest on the amount overdue at the Prime Lending Rate of HYDRO's bank plus 2%.

## 9. FINAL ACCEPTANCE

- 9.1 Upon completion of the SERVICES or of such part or portion of the SERVICES as may relate to a separable part or portion of the PROJECT, CONSULTANT may apply in writing to HYDRO for a FINAL ACCEPTANCE certificate with respect to such completed SERVICES. Upon receipt of such request,

HYDRO shall determine if the SERVICES to which the request relates have been completed to the satisfaction of HYDRO. Upon making such determination, HYDRO shall issue a FINAL ACCEPTANCE certificate with respect to the SERVICES to which the request relates or inform CONSULTANT of the further requirements for issuance of such certificate. Issuance of a FINAL ACCEPTANCE certificate shall constitute FINAL ACCEPTANCE of the SERVICES, or the part or portion thereof, to which the certificate relates.

- 9.2 Prior to FINAL ACCEPTANCE of the SERVICES, or any part or portion thereof, HYDRO may take over the PROJECT, or any part or portion thereof, in which event CONSULTANT shall arrange for the transfer of the care, custody, and control of the PROJECT, or part or portion thereof, to HYDRO who shall thereafter be responsible for its operation and maintenance. Procedures acceptable to HYDRO shall be established to effect such transfer.

## **10. RECORDS AND ACCOUNTS OF REIMBURSABLE COSTS**

CONSULTANT shall keep records and accounts showing all expenditures of whatever nature constituting Reimbursable Costs. CONSULTANT's records shall be kept in accordance with generally accepted Canadian accounting principles and practices consistently applied and its accounts shall be segregated in a manner satisfactory to HYDRO. HYDRO and its duly authorized representative shall, at all reasonable times, have access to all such records and accounts which shall be delivered to HYDRO in formats acceptable to HYDRO, upon FINAL ACCEPTANCE or on termination of this CONTRACT, whichever occurs first. Nevertheless, CONSULTANT shall have the right to have access to all such original records and accounts at any reasonable time for purposes connected with the PROJECT.

## **11. SUSPENSION OR TERMINATION**

- 11.1 Suspension: HYDRO may suspend the performance of the SERVICES hereunder, in whole or in part, at any time and from time to time for a period not exceeding six (6) calendar months on each occasion. During the period of suspension, CONSULTANT shall remain prepared to reactivate its SERVICES and shall resume the performance of its SERVICES as directed by HYDRO.
- 11.2 In the event of suspension of the performance of the SERVICES at the request of HYDRO the payment of costs incurred to that date, calculated in accordance with Article 5 - Remuneration, shall be deemed to be reasonable compensation to CONSULTANT for the SERVICES rendered prior to that date.
- 11.3 If during any period of suspension requested by HYDRO, CONSULTANT reasonably incurs expenses under the CONTRACT which have been mutually agreed to in writing by HYDRO and CONSULTANT and provision for compensating CONSULTANT in respect of such expenses is not made elsewhere in

the CONTRACT, HYDRO shall pay CONSULTANT for same an amount to be determined on a fair and equitable basis.

11.4 Termination: HYDRO shall have the right at any time to terminate the CONTRACT by giving CONSULTANT thirty (30) calendar days' written notice prior to termination of the CONTRACT.

11.5 Article 16 – Insurance of the Contract survives any termination notice given under the Contract.

## **12. FORCE MAJEURE**

12.1 Neither party shall be considered in default in the performance of any of its obligations hereunder to the extent that performance of any such obligations is delayed, hindered, or prevented by Force Majeure.

12.2 Force Majeure shall be any cause beyond the control of the party pleading it which such party could not reasonably have foreseen and guarded against.

12.3 Force Majeure includes acts of God, floods, earthquakes, strikes, fires, riots, incendiarism, interference by civil or military authorities, compliance with the regulations or order of any government authority, acts of war (declared or undeclared) and civil disobedience, provided that such cause could not reasonably have been foreseen and guarded against by it.

## **13. OWNERSHIP OF DRAWINGS AND PROPERTY ACQUIRED FOR PROJECT**

13.1 All drawings, calculations, work sheets, and like documents, including software and intellectual property, prepared or caused to be prepared by CONSULTANT in connection with the PROJECT shall become the property of HYDRO. CONSULTANT shall have the right to retain a copy of all such documents and to make use of them in the course of its general business, with HYDRO's consent, only in respect of any confidential information acquired by CONSULTANT from HYDRO. Nevertheless, CONSULTANT shall have the right to have access to all such original documents at any time during the life of the PROJECT for purposes connected with the PROJECT.

13.2 Upon FINAL ACCEPTANCE, or upon termination of the CONTRACT, HYDRO shall be entitled to all property, including software and intellectual property, the cost of which has been reimbursed to CONSULTANT under the provisions of the CONTRACT, and which has not been consumed, lost or destroyed in or during the performance of the SERVICES nor disposed of by sale or otherwise with the approval of and for the benefit of HYDRO, or already taken over by HYDRO under Article 9 – FINAL ACCEPTANCE.

## **14. COMPLIANCE WITH LAWS**

CONSULTANT shall use due diligence, skill and care to observe and abide by and keep itself fully informed of all applicable laws, rules and regulations of any country, state, province and municipality where the SERVICES are performed and the laws, rules and regulations of authorities acting thereunder in connection with the performance of the SERVICES. The SERVICES performed by CONSULTANT shall be in compliance with all applicable laws in effect or which may become effective before completion of the PROJECT or the CONTRACT.

## **15. CONCESSIONS, PERMITS, LICENSES, EASEMENTS AND RIGHTS-OF-WAY**

HYDRO shall secure, at its own expense, all concessions, permits, licenses, easements, and rights-of-way necessary for completion of the PROJECT, including any and all licences and permits for water, highway and public utility crossings, and establishment of jetties. CONSULTANT shall, to the best of its knowledge, advise HYDRO of requirements and shall use its best efforts in assisting HYDRO in obtaining such concessions, permits, licences, easements and rights-of-way, and in furnishing services and economic studies in connection with applications to and hearings before authorities having jurisdiction over the construction, management or operation of the PROJECT, provided that all costs and expenses so incurred by CONSULTANT shall be reimbursable by HYDRO.

## **16. INSURANCE**

- 16.1 HYDRO shall carry insurance with respect to the PROJECT consistent with its normal policies and practices for construction of capital projects of a similar nature and shall require its CONTRACTORS for the PROJECT to carry insurance satisfactory to HYDRO with respect to the performance of their contracts.
- 16.2 CONSULTANT shall carry professional errors and omissions liability insurance in an amount not less than five million (\$5,000,000) dollars and shall ensure that each consultant who has a professional liability exposure and who is engaged by the CONSULTANT in the performance of the SERVICES is covered against professional errors and omissions in an amount not less than five million (\$5,000,000) dollars. Such insurance shall be in effect for at least twelve (12) months following FINAL ACCEPTANCE or completion of the PROJECT, whichever is longer.
- 16.3 CONSULTANT shall maintain at its expense Commercial General Liability Insurance for an amount not less than one million (\$1,000,000.00) dollars for any one accident or occurrence. Such insurance shall include HYDRO as an additional insured and contain a cross liability clause.



- 16.4 CONSULTANT shall maintain at its expense Automobile Liability Insurance for an amount not less than one million (\$1,000,000.00) dollars for any one occurrence involving bodily injury and/or property damage.
- 16.5 CONSULTANT shall provide HYDRO with proof of the insurance coverage which it is required to maintain in full force and effect during the performance of the SERVICES.
- 16.6 All insurance policies shall provide that the insurance shall not be cancelled, reduced, restricted, terminated, or materially changed in any way or be allowed to lapse without at least thirty (30) calendar days written notice to HYDRO, except in the event of non-payment when policy conditions dealing with termination will apply. Such notice shall be sent by prepaid, registered mail to the head office of HYDRO. In the event of any such cancellation, reduction, restriction, termination, change, or lapse in any insurance, CONSULTANT shall immediately replace such insurance.
- 16.7 **Other Insurance** - Prior to commencing the performance of any part of the SERVICES on the Site, the CONSULTANT shall have in place any other insurance which is required by law and may also have in place any other insurance which the CONSULTANT considers necessary or prudent.
- 16.8 **Failure to Obtain** - Where CONSULTANT fails to comply with the requirements of this Article HYDRO may take all the necessary steps to affect and maintain the required insurance coverage at CONSULTANT's cost.
- 16.9 **Liability** - Where an insurer fails or refuses to pay any claims under an insurance policy covering the activities of CONSULTANT or a subcontractor of CONSULTANT relating to or arising out of the SERVICES or performing the Contract, CONSULTANT and its subcontractor shall not be released from any liability arising under the Contract.

## **17. ENVIRONMENT**

CONSULTANT shall demonstrate in the performance of the SERVICES that it is environmentally responsible by complying with all applicable environmental legislation and regulations and taking all reasonable and necessary measures in the performance of the SERVICES to avoid causing negative impacts to the environment. Where negative impacts cannot be avoided, CONSULTANT shall be solely liable to undertake all reasonable and necessary measures to minimize the effect of such negative impacts.

## **18. SENIOR PERSONNEL**

CONSULTANT shall appoint senior personnel to supervisory positions agreed upon by CONSULTANT and HYDRO. Such personnel shall be subject to HYDRO's approval before their appointment and shall expend

sufficient time working on the PROJECT so as to ensure that the SERVICES are performed in accordance with the CONTRACT and to ensure successful completion of the PROJECT.

## **19. WORKERS' COMPENSATION**

- 19.1 CONSULTANT shall pay all assessments due under the relevant Workers' Compensation legislation. Prior to commencing SERVICES, CONSULTANT shall obtain and deliver to HYDRO a certificate or certificates establishing that it is in good standing with the Workplace Health, Safety and Compensation Commission of Newfoundland and Labrador and with the comparable board or commission of any other province having jurisdiction in connection with CONSULTANT's performance of the SERVICES.
- 19.2 CONSULTANT shall produce, upon the request of HYDRO, a satisfactory certificate(s) clearing all indebtedness under relevant Workers' Compensation legislation prior to the payment of any monies owing to CONSULTANT.

## **20. NOTICES**

- 20.1 Any written notice provided for herein to be given to one party by the other party shall be deemed properly given and received if:-
- (a) delivered by hand to the receiving party's designated representative; or
  - (b) either:-
    - (i) being mailed by prepaid registered mail; or
    - (ii) transmitted by electronic methods;to the receiving party's address as either stated in this Article or as changed through written notice to the other party.
- 20.2 Any notice which is sent by prepaid registered mail or transmitted by electronic methods shall be deemed to be given and received forty-eight (48) hours after mailing or transmission, as applicable; provided that if such time expires on a Saturday, Sunday or legal holiday, the notice shall be deemed to be given and received on the next normal business day.
- 20.3 Addresses of parties are:-

HYDRO:

Newfoundland and Labrador HYDRO  
P. O. Box 12400  
500 Columbus Drive  
St. John's, Newfoundland and Labrador  
A1B 4K7

Attention:

Email:

Fax:

CONSULTANT:

Attention:

Email:

Fax:

or to such other address as either of the parties shall designate by written notice given as herein required.

## **21. ASSIGNMENT**

Neither of the parties hereto shall assign the CONTRACT or any part thereof or any interest herein without the prior written approval of the other party hereto, which approval shall not be unreasonably withheld.

## **22. GOVERNING LAW AND FORUM**

The CONTRACT shall be governed by and construed in accordance with the laws of the Province of Newfoundland and Labrador and every action or other proceeding arising hereunder shall be determined exclusively by a court of competent jurisdiction in the Province of Newfoundland and Labrador, subject to the right of appeal up to the Supreme Court of Canada where such appeal lies.

## **23. EFFECTIVE DATE OF CONTRACT**

This CONTRACT shall have effect on .

## **24. NO WAIVER**

None of the provisions of the CONTRACT shall be considered waived by CONSULTANT or HYDRO except when such waiver is given in writing. No such waiver shall be or shall be construed to be, a waiver of any past or future default, breach or modification of any of the terms, provisions, conditions or covenants of the CONTRACT except as expressly stipulated in such waiver.

## **25. SUCCESSORS AND ASSIGNS**

The CONTRACT shall enure to the benefit of and be binding upon the successors and permitted assigns of the parties hereto.

## **26. PROGRESS MEETINGS**

26.1 CONSULTANT shall be expected to convene a regular monthly progress review meeting (more frequently if required by HYDRO) which will be attended by HYDRO personnel and shall generally address the following and any other subjects that may be pertinent to the performance of the SERVICES:

- (a) a review of the status of the technical aspects of the SERVICES, including design and site layout options, details of any studies undertaken and the status and findings of any field programs;
- (b) the schedule and cost budget for the SERVICES versus the actual person-hours and cost expended by activity to the date of the meeting;
- (c) review of CONSULTANT's personnel involved in the performance of the SERVICES;
- (d) the time and cost to complete the SERVICES and the total forecast-final-cost of performance of the SERVICES;
- (e) a review of the status of the construction at the JOBSITE;
- (f) a review of equipment, manufacturing and delivery schedules; and
- (g) an update by HYDRO of related work undertaken by HYDRO.

26.2 CONSULTANT shall prepare and circulate in a timely manner the minutes of such meetings and shall have them acknowledged by the CONSULTANT's PROJECT Manager and HYDRO. The minutes of previous meetings shall be reviewed at subsequent meetings until all action requirements are completed.

26.3 Meetings shall be convened at .

## **27. DUTY OF CARE**

CONSULTANT agrees to use reasonable care, skill, competence and judgment in the performance of the SERVICES hereunder which are generally consistent with professional standards for individuals providing

similar services at the same time, in the same locale, and under like circumstances. No other warranty, expressed or implied, is made or intended by this agreement.

## **28. INDEMNITY**

Each party agrees to indemnify, defend and hold harmless the other party, its officers, directors, employees, owners, agents, subcontractors, consultants, successors and assigns against all claims and liabilities arising out of, related to, or based upon the negligence or willful misconduct of the indemnifying party or a breach of this CONTRACT by the indemnifying party.

**IN WITNESS WHEREOF**, the parties hereto have executed this Agreement under their respective Corporate Seals as of the day and year first above written.

Signed and sealed in the presence of:

**NEWFOUNDLAND AND LABRADOR HYDRO**  
**(Owner)**

\_\_\_\_\_  
(Witness)

**BY:** \_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Witness)

**AND:** \_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Title)

Signed and sealed in the presence of:

**SUCCESSFUL CONSULTANT**  
**(CONSULTANT)**

\_\_\_\_\_  
(Witness)

**BY:** \_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Witness)

**AND:** \_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Title)

