

**BOARD OF COUNTY COMMISSIONERS**

**DATE:** February 24, 2015

**AGENDA ITEM NO.** 21

**Consent Agenda** ☐

**Regular Agenda** ☒

**Public Hearing** ☐

**County Administrator's Signature:**

**Subject:**

Non-Competitive Purchase: Waste to Energy Plant Turbine Generator Steam Path Replacement  
Contract No.: 134-0299-N (LN)

**Department:**

Solid Waste / Purchasing

**Staff Member Responsible:**

Kelsi Oswald / Joe Lauro

**Recommended Action:**

I RECOMMEND THE BOARD OF COUNTY COMMISSIONERS (BOARD) APPROVE THE NON-COMPETITIVE PURCHASE FOR THE WASTE TO ENERGY PLANT TURBINE GENERATOR STEAM PATH REPLACEMENT TO GENERAL ELECTRIC INTERNATIONAL, INC. (GE), TAMPA, FLORIDA.

IT IS FURTHER RECOMMENDED THAT AFTER EXECUTION OF THE AGREEMENT BY THE CONTRACTOR, THE CHAIRMAN SIGN AND THE CLERK ATTEST.

**Summary Explanation/Background:**

This project consists of replacing the turbine generator steam path at the Waste to Energy Facility (WTE). The turbine generator has been in operation for thirty-three (33) years and has reached the end of its useful life. An inspection of the turbine has revealed mechanical issues and wear of various components creating a loss of efficiency, reducing the amount of electricity the WTE produces. Replacement of turbine blades may no longer be possible due to wear of the steam path rotor base metal.

Staff recommends this project be awarded non-competitive to GE, as the only reasonable and practicable source and as the original equipment manufacturer (OEM). While other non-OEM firms may be able to propose a solution to replace the turbine generator, such a solution would require reverse engineering based on current conditions which have degraded from original design and would not incorporate any improvements that have potential to significantly increase electrical generation and associated revenues. The process to reverse engineer is typically expensive, timely and prone to error. Non-OEM firms would have to deduce design features with little or no additional knowledge about the procedures or techniques involved in their original production. There is also an inherent risk in transporting the unit to support any reverse engineering effort as well as associated downtime that would result in lost revenue and potential impacts on the capacity factor. GE, as the original supplier, has developed and incorporated significant reliability and efficiency improvements in the proposed new steam path.

**Fiscal Impact/Cost/Revenue Summary:**

Replacement of In-Kind Steam Path:	\$6,500,000.00
Flow Parts:	\$ 76,439.00
Major Inspection and steam path installation:	\$ 428,500.00
Optional Installation Services:	\$ 350,100.00
Contingency – Casing Allowance	\$ 500,000.00
Contingency – 10% of Installation	\$ 135,500.00
Estimated Total Expenditure:	\$7,990,539.00

Funding for this project is provided by Solid Waste Renewal and Replacement Capital Improvement Program Budget.

**Exhibits/Attachments:**

Contract Review  
GE Proposal



**PURCHASING DEPARTMENT  
CONTRACT REVIEW TRANSMITTAL**

CATS  
NO.: 44618

**PROJECT: Non-competitive Purchase: Steam Path Turbine Generator Replacement**

**RFP NUMBER: 134-0299-N (LN)**

**TYPE:** ☐ Purchase Contract ☒ Other: ☐ Construction-Less than \$100,000 ☐ One Time

In accordance with the policy guide for Contract Administration, the attached documents are submitted for review and comment.

Upon completion of review, complete Contract Review Transmittal and forward to next Review Authority listed. Please indicate suggested changes by revising, in RED, the appropriate section of the document reflecting the exact wording of the change.

**RISK MANAGEMENT:** Please enter required liability coverage on pages:

**PRODUCT ONLY** ☐

This is an annual contract. **Estimated Expenditure: \$7,455,149.00**

REVIEW SEQUENCE	REVIEW AUTHORITY	REVIEW DATE	REVIEW SIGNATURE	COMMENTS (Attach Separate page if necessary)	COMMENTS INCORPORATED
1.	Purchasing Dept. J. Lauro, Director C. Mancuso, Ass't. Director	4/17	<i>[Signature]</i>		
2.	DEI - Solid Waste R. Hauser, Director K. Oswald, Section Manager	4/23 4/24	K. Oswald <i>[Signature]</i>		

**Using Dept please provide below information:**

- A. ☐ Yes, funding for this project is using grant funding. ☐ No, funding for this project is not using grant funding.  
If grant funding is being used you must provide Purchasing with the exact clauses that need to be on attached document.
- B. \_\_\_\_\_ Initial and Date Funding is available for this project.  
Provide title of funding source \_\_\_\_\_
- C. Please check attached vendor list. Circle vendors you want bids mailed to. Add additional vendors with complete information (Name, Address, Phone and Email)

3.	Risk Management Director Attn: Virginia E. Holscher (Check applicable box at right)	5/16/14	GO	1) See changes PG 23, 24 Addition of Attachment 1 Ins. Req. 2) See changes PG A3 see Exhibit B Ins. Requirements	HIGH RISK NOT HIGH RISK
4.	Legal Attn: Miles Belknap	5/16/14	MB	Reviewed w. Joe Manning & Per Joe Lauro's Contract, Revised Non competitive justification	

**RETURN ALL DOCUMENTS TO PURCHASING**

Make all inquiries to: Lucy Nowacki, Procurement Analyst at Extension 43766  
In order to meet the following schedule, please return your requirements to Purchasing by:

TENTATIVE DATES	Advertise:
Bid Opening:	Contract Approval



*GE Power and Water*

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**Pinellas County Solid Waste  
St. Petersburg, FL**

**Steam Path Replacement and  
Turbine Major Inspection  
Turbine/Generator #1  
Proposal**

UNIT SN:	197866
PROPOSAL:	197866, Rev. 22
DATE:	January 30, 2015



## **GE Power and Water Proposal**

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**Pinellas County  
3095 114<sup>th</sup> Ave, North  
St. Petersburg, FL 33716**

**Attn: Kelsi Oswald, WTE Section Mgr.**  
Phone: **727-464-7514**  
Email: **koswald@pinellascounty.org**

QUOTATION No: 197866 Rev 22  
TURBINE No: 197866  
DATE: January 30, 2015  
NOTICE: This quotation is valid through February 26, 2015 and is subject to change upon notice.

Type of Service:

- ☒ Parts
- ☒ Project Management
- ☒ Craft Labor
- ☒ Test
- ☐ Training

GE Power and Water, a business unit of General Electric International, Inc. (GEI), respectfully submits this firm proposal for a replacement steam path for GE TSN 197866 to the Pinellas facility in St. Petersburg, FL. This proposal is based on our current design records on file.

**Rev. 22** – This revision 22 updates the proposal to reference the correct revision number throughout the proposal. It also removes GE's proprietary statement and replaces it with language noting that the proposal is subject to the state of Florida public record laws.

GE is committed to offer the County of Pinellas the best possible package. If you have any questions, please do not hesitate to contact us at your earliest convenience.

Sincerely,

**GENERAL ELECTRIC INTERNATIONAL INC.**

By: **James Heuker**  
Address: 501 East Kennedy, suite 600  
Tampa, FL 33602  
Tel: 813-286-4886  
Mobile: 813-505-8403  
Fax: 813-286-4808  
Email: James.Heuker@ge.com



## **GE Power and Water** **Proposal**

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### **EXECUTIVE SUMMARY**

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GE offers a major inspection and replacement steam path for TN 197866 for Pinellas County's steam turbine life extension project. GEI will staff this project with field engineers to provide project management, technical direction, labor supervision and start-up services. Atlantic Plant Maintenance (APM), GEI's labor affiliate will provide the craft labor. The project management team will implement the workscope as detailed herein, which encompasses the following main components:

- Mobilization/Site Preparation
- Disassemble, clean and inspect and reassemble:
  - Turbine
  - Replace steam path components
  - Stop valve
  - Non-return valves
  - Control valves
  - Lube oil components
- Start-up
- Demobilization

The **Replacement-In-Kind Steam Path** offering is a replacement-in-kind rotor assembly, diaphragms and shaft seals, designed with the same form, fit, and function as the original hardware. However, the new components will be upgraded to meet GE's current design standards, therefore offering a more reliable solution.

One remarkable benefit to replacing the entire steam path is reclaiming performance that has been lost due to factors such as age and component damage. Based on the age of the unit, GE estimates these degradation losses at about 8%, which equals a 3,980 kWe loss. Please see Section 1.5 Performance Degradation for more information.

The complete replacement of the steam path will recover all of the losses caused by degradation. This 3,980 kWe loss is worth approximately \$1.13 Million USD per year in power



## ***GE Power and Water Proposal***

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revenue at the rate of \$0.035/kw-hr for 8,322 hrs per year (95% operation). Please see Section 1.8 for more information.

A Performance Guarantee and a Post-Outage Performance Test are included. The Performance Test is to be conducted within four weeks of installation of the replacement steam parts for the purpose of demonstration of the turbine's performance.

GE Power Generation Services optimizes schedules based upon your preferred mode of operation and our experience in implementing and executing a project of this magnitude. The core work activities will be performed working up to two 12-hour shifts per day, 7 days per week. This work scope will be executed to optimum performance levels by utilizing our resources, and the support of Pinellas County coordinators.

It is our pleasure to provide you our services, and we are looking forward to hear a favorable answer from you. If you have any questions, please don't hesitate to call our dedicated team willing to help you at any time.



**GE Power and Water  
Proposal**

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**Signature Page**

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement the day and year first written.

**PINELLAS COUNTY, FLORIDA**

by and through its \_\_\_\_\_

*GENERAL ELECTRIC INTERNATIONAL, INC.*

\_\_\_\_\_

By: \_\_\_\_\_

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

**ATTEST:**

**KEN BURKE, CLERK OF COURT**

By: \_\_\_\_\_

Deputy Clerk

**APPROVED AS TO FORM**

By: \_\_\_\_\_

Office of the County Attorney



## **GE Power and Water** **Proposal**

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## **GE Power and Water**

### **Proposal**

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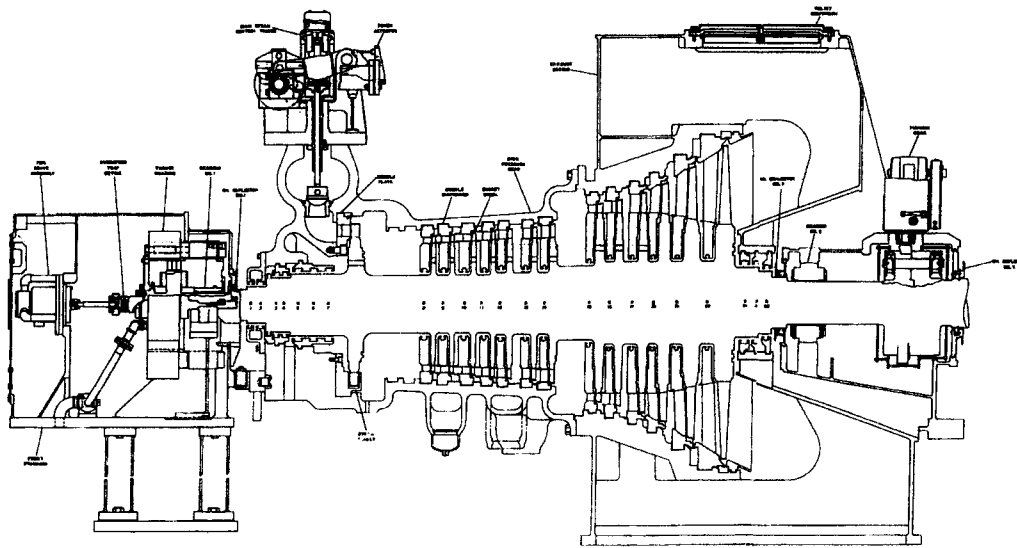


## **1. STEAM TURBINE UPGRADING DEFINITION**

### **1.1 Background**

The subject GE steam turbine SN 197866 is a straight condensing machine rated at 50,580 kW with four uncontrolled extractions used for feed water heating. It has 14 stages and was designed for inlet steam conditions of 600 psig / 750 F and 3.5" HgA exhaust. This turbine is driving GE generator SN 161X540. This generator was installed in 2008 to replace the original generator SN 316X419. The turbine and the original generator were supplied circa 1981 from the GE Lynn, MA USA factory to Procon, Inc. in Tampa, FL.

Please see the turbine cross-section in Figure 1 below.



**Figure 1 – GE TN 197866 Cross Section**



## **1.2 Objective**

This proposal is provided for the County of Pinellas steam turbine life extension project. GE offers a new replacement rotor assembly, diaphragm assembly, stage 1 nozzle plate and shaft seals designed for the same form, fit, and function as the original equipment.

Based upon the operating history of the machine and its age, this is a critical time to complete the proposed life extension program and extend its useful life. Steam turbine buckets are particularly sensitive to time-dependent aging effects. When a bucket fails in operation, metal pieces often propagate downstream through the steam path, causing significantly more damage than the original failure.

## **1.3 Proposed Life Extension Upgrade**

The proposed steam path will be designed to meet GE's current design standards. Today's current design standards are more stringent than those used when the original machine was built. The past failures found on the L-1 and L-0 blades have been reviewed by engineering and design improvements have been incorporated into the design. The proposed design addresses this issue for the L-0 blade design, in that the entire stage will be replaced with a modern, more reliable design. The L-1 blade design cannot be completely replaced with the modern design due to the constraints of the existing exhaust casing. However, improvements can be made that will not be impacted by the allowable casing envelope. This will ensure that the new steam paths proposed will be a reliability improvement compared to the original. See Section 2.1 for RIK Steam Path.

## **1.4 Additional Benefits**

### **GE Specified Alloy Steel Forgings**

The proposed forged rotor is made from Ni-Mo-V material in strict compliance with GE's specifications for turbine rotors for high temperature service. This GE specified forging material is especially suited for condensing turbines in high temperature service as the material is optimally balanced to have high strength at elevated temperatures while achieving excellent fracture toughness / ductility characteristics that are needed at the low pressure, much cooler exhaust end of the rotor. Each forging receives rigorous non-destructive testing both prior to and after machining to assure the most reliable rotor design.



### **New Rotor High Speed Balance**

When a new rotor is manufactured and low speed balanced, a residual unbalance is left in the rotor and must be reduced to the lowest extent possible to assure a smooth running machine at full speed. The GE High Speed Balance Cell located in Lynn MA can balance the rotor over its entire operating speed range to ensure smooth operation even at trip speed.

The rotor is progressively balanced at operating speed by using multiple balancing planes machined into the rotor. These balancing planes are located at mid-span and on the ends of the rotor to ensure an effective dynamic balance. Note: field access balance planes are not used. The rotor is balanced to meet or exceed stringent GE specifications. After the final balance, the rotor is accelerated to overspeed to confirm acceptable levels of vibration and mechanical integrity even at trip speed.

Some of the advantages of a high-speed balance are:

- Rotor vibration levels can be confirmed throughout the entire speed range.
- High speed balance is much more effective than a low speed balance since the dynamic effects of shaft bending and associated unbalance couples are eliminated by the high speed balance.
- New buckets are positively "set" by the high-speed centrifugal forces during the balance.
- Hydrodynamic effects of babbitted bearings are properly simulated.
- High speed balance is much more sensitive as the unbalance force increases with speed.
- Proper, smooth operation of the rotor is ensured eliminating the need for on site field balancing.
- Start up problems and associated delays are prevented.

### **New Diaphragm Designs**

The proposed nozzle plate and diaphragm designs will be updated to current standards. The vane shapes will be updated to use currently available metal sections. The number of nozzles per 360 will be evaluated to assure they are harmonically tuned to reduce bucket resonances. Modern standard diaphragm materials and construction techniques will be utilized.

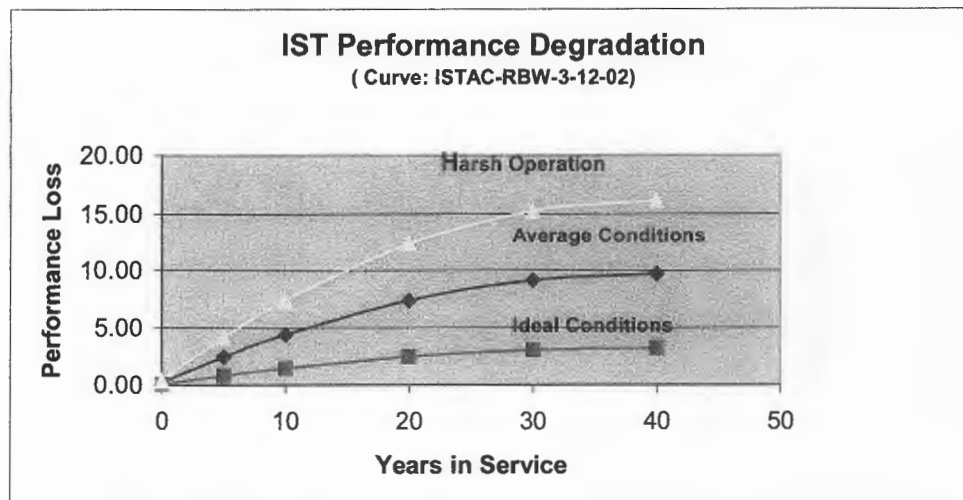


## 1.5 Performance Degradation

Based on performance history of numerous GE units, Figure 2 shows typical expected turbine degradation over time due to effects such as aging, steam and water erosion, surface corrosion, mechanical damage, steam contamination (deposits), worn packing and spill strip clearances and solid particle erosion. On this basis, the subject County of Pinellas turbine with over 25 years of operation, degradation approaching 8% can be expected. The exact value would also depend on steam quality and maintenance/operation practices over the years.

See Figure 2 for more details. The 8% degradation assumption can be confirmed or adjusted by evaluating site performance data that might determine a different value.

Complete recovery of degradation is achieved by replacement of steam path components – primarily nozzles, buckets, bucket seals and shaft packing. Grit blast cleaning and water washing of existing nozzles and buckets is effective to remove water-soluble deposits only. Hand working of components to restore surface finish and geometry can also be effective depending on geometry limitations and effort spent. In replacing a typical stage, new nozzles might recover 65 % of the degradation, new buckets 30 %, and seals 5 %.



**Figure 2 – Typical Steam Path Degradation vs. Age of Turbine**



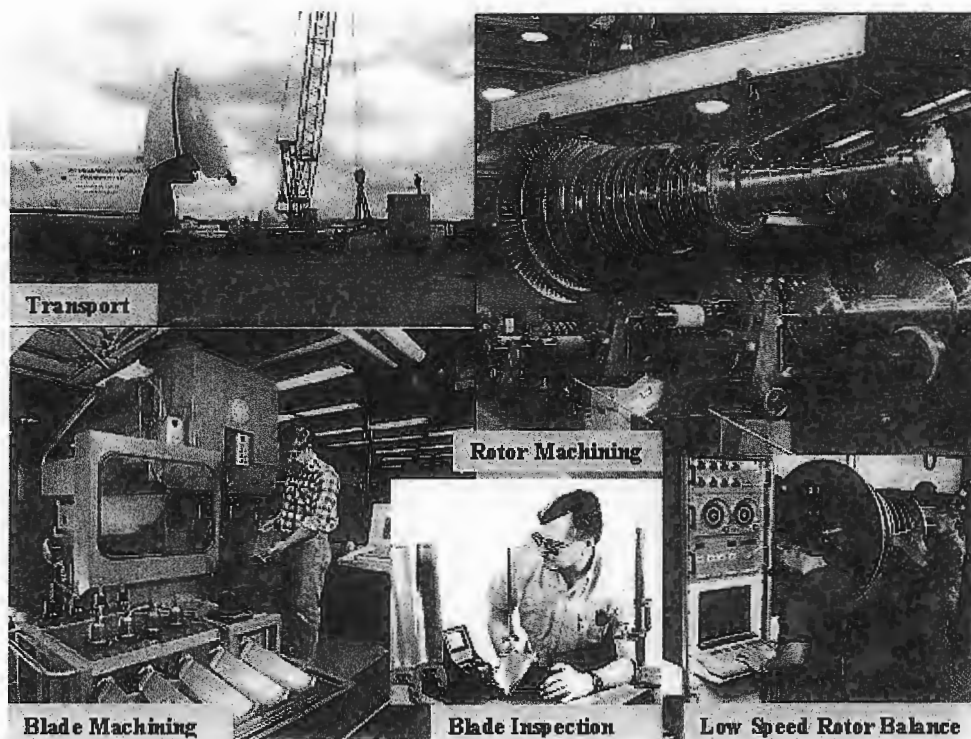
## **GE Power and Water Proposal**

## **Steam Turbine Upgrade Definition**

### **1.6 Manufacture**

The proposed steam path components Buckets, Rotor and Diaphragms are manufactured in our state of the art facility in Bangor Maine. The Bangor facilities have 450,000 sq/ft of manufacturing space with over 410 employees and manufacture approximately 50 rotors annually. The site is ISO 9001:2000 compliant and has earned a VPP Star status. Having 40 plus years of experience manufacturing new and uprating existing rotors they incorporate the latest manufacturing technology, highest standards of quality and supply the most reliable steam turbine rotors in the world.

Our Bangor personnel welcome witnessing of component manufacture. Some sample witness opportunities are; MPI checks of the machined rotor, bucket installation, High Speed balance and final turnover/ inspection after HSB. The completed rotor will be low speed balanced (400 rpm) at our Bangor plant and then sent to the Lynn, MA, plant for full high-speed balancing.



**Figure 3 – Bangor Plant Operations**



## **1.7 Proposed Life Extension Upgrades**

This proposal defines only a new replacement steam path. The offering is for a replacement-in-kind steam path in which GE will make incremental changes to bring the current design up to today's standards including improvements in the last stage.

## **1.8 Replacement In Kind Steam Path**

The offering defines the replacement in kind steam path that has been proposed in previous revisions of this proposal. The components included within this proposal will be replacement components that match form, fit and function of the original design of the machine. Components will be updated to current GE standards. Not all of the originally designed components may be available for direct replacement. In these cases, suitable substitutions in design or material will be utilized and applied to conform to the original form, fit and function of the component.

During the engineering review it was discovered that the present turbine design does not meet today's design criteria with regards to thrust loading. This issue could display itself as elevated thrust bearing temperatures during certain operating conditions and could potentially lead to a thrust bearing failure. Engineering determined the existing HP seal arrangement and interstage shaft diameters have inherent step thrust loadings. By modifying the HP seal area and interstage shaft diameters, most of this step thrust can be removed and the turbine thrust loadings will be reduced to meet today's design criteria.

With the supply of the new rotor and diaphragms, these changes can be accounted for in the new design. The only existing item that needs to be changed that was not part of the original scope is the HP seal packing ring holder for rings R3 and R4. Therefore, a new packing ring holder and new R3 and R4 packing rings will be supplied as part of the scope of supply.

### **Replacement in Kind Performance**

The performance matches that of the original design. Table 1 compares the original design unit with an estimated 8% degradation to the original design unit in a new and clean condition. The performance numbers shown reflect the existing turbine design modeled within today's turbine computer performance programs. There may be a slight difference when compared to the as built performance information originally supplied.



**GE Power and Water**  
**Proposal**

**Steam Turbine Upgrade Definition**

**Table 1 – Replacement in Kind Estimated Performance (See Section 2 for Heat**

		As is with degradation	Option 1 - New Steam Path
Degradation		8%	0%
Case #		1	2
Heat Bal		HB1	HB2
Inlet Press Psig		600	600
Inlet Temp F		750	750
Inlet Flow #/Hr		501900	501900
Exh Press "HgA		3.5	3.5
Output KW		45765	49743
Delta KW		Base	3978
Delta %			8.7%
Heat Rate BTU/kWHr		12717	11700
Delta HR		Base	-1017
Delta %			-8.0%

**Balance Details)**





## GE Power and Water Proposal

## Steam Turbine Upgrade Definition

### Replacement in Kind Scope of Supply

To achieve the purposed steam path replacement the hardware shown in Table 2 is required.

Material Scope of Supply for TN 197866	Quantity
New monoblock alloy steel bucketed Rotor Assembly designed to be a replacement in form, fit and function including the emergency overspeed governor and ring gear. New buckets on all 14 stages fitted to integral wheels utilizing GE's modern reduced stress, multiple hook modified fir tree dovetails.	1 Assembly
Rotor High Speed Balance at GE Lynn High Speed Balance Center.	Included
New stage 1 nozzle plate with all new mounting hardware including mounting bolts and caulking.	1
New stage 1 steam shield with mounting hardware.	1
New diaphragms stages 2 -14. Includes new interstage labyrinth packing, springs and mounting hardware.	13
New HP shaft end packing rings (R1 - R7). New springs and hardware included.	7
New HP seal Packing Ring Holder for rings R3 & R4 designed to accommodate the change in shaft diameter for reduced thrust. New mounting hardware is included.	1
New LP shaft end packing rings (R21 - R23). New springs and hardware included.	3
Flow Parts: new oil deflectors – No's 1 and 2	*
Flow Parts: new quill shaft drive and coupling	*
Flow Parts: new coupling bolts & nuts	*

**Table 2 – Scope of Supply for replacement in kind steam path**

\* Items listed above with "\*" are part of the Major and quoted as **GE Flow Parts** replacement spares. They are priced separate from the steampath components in this proposal.



**Engineering Scope of Supply**

Upon completion of the design phase, GE will document the results with:

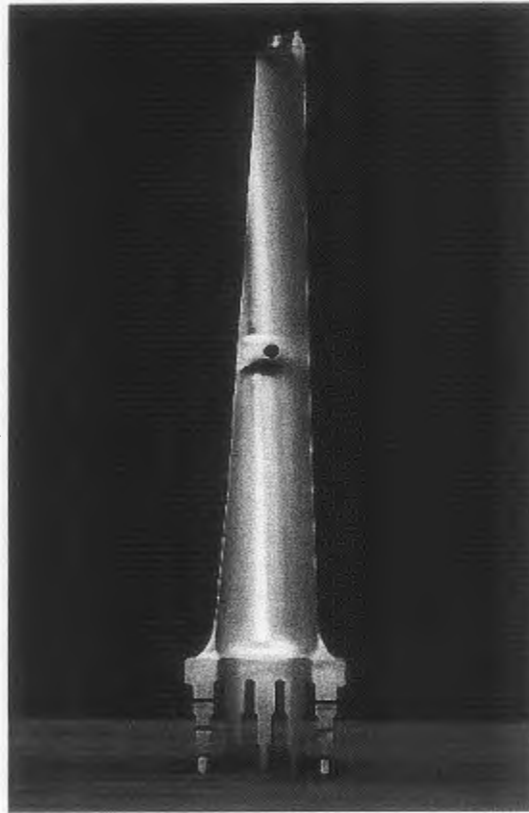
- New performance curves
- Listing of new parts and drawings
- Instruction Book Inserts

**Modern Last Stage Design**

Over the past few years, utilities have been very interested in extending the useful lives of their older units by upgrading. This includes not only refurbishment of critical components, but also the use of replacement components where significant gains in unit heat rate or unit availability can be achieved. A very effective method of improving unit heat rate is to consider the use of improved last stage designs. Since the last stage of a turbine provides approximately 10% of the total plant output, any improvements in last stage efficiency results in significant economic benefits.

Since the 1960's, significant improvements in the understanding and application of aerodynamic flow technology have been made. This technology was first used on GE's 30" and 33.5" last stage designs, of which over 200 units are in service with ratings of up to approximately 900 MW. Recently, GE extended the use of this technology and redesigned its 26" last stage. Now, a redesigned 20" last stage bucket, offering benefits of state-of-the-art design, is also available. These designs are available for new units as well as for retrofits on existing turbines, which can result in overall unit heat rate improvements of up to 1% or more.

See Figure 4 - Modern 20" LSB.



**Figure 4 – Modern 20" Last Stage Bucket**

#### 20" Last Stage Redesign

The 20" last stage bucket was first put into service in 1940. Over 200 turbine sets are now in service with this last stage bucket. The original 20" design consists of vanes connected into groups utilizing a single brazed tie wire, a peened single piece cover and a finger dovetail or a tangential entry dovetail. Overall, the reliability record of this design has been very good. As was the case for the original 26" and 23" last stage, when the original 20" design was introduced, it was based on the best technology available at that time and has very good performance. However, to take advantage of the design technology improvements that have become available and incorporated into



the longer 3,600 rpm last stage designs, a program was undertaken to redesign the 20" last stage bucket. The result of this program is an improved 20" last stage available for either new unit application, or for upgrade of in-service turbine sets.

For in-service turbine sets, a review of the efficiency improvements concluded that the most significant benefits would result from redesigning the bucket vane sections; along with design changes in moisture removal provisions and leakage flow control over the tip of the bucket. Therefore, by only replacing the last stage bucket row and by making modifications to the existing last stage diaphragm, a gain of up to 0.4% in efficiency overall is generally realized. For new applications, or where the diaphragm will be replaced, an additional improvement of 0.4 to 0.6% can be achieved, giving an overall improvement of about 1%. A more precise estimate can be determined on a unit specific basis.

#### Features of the Redesign

The new 20" last stage design features include:

- Improved radial mass flow distribution
- Improved tip leakage control permitting better moisture removal
- Elimination of moisture removal pocket flow loss (with a new diaphragm)
- Improved vane section contours to improve efficiency
- Continuously-coupled bucket tips utilizing over-under covers for vibration suppression
- Four piece loose tie wire at mid-vane for increased mechanical damping and suppression of vibratory modes
- Self shielded erosion resistant material eliminating the need for flame hardening or Stellite inlays



### Modern Material Selection

Material selection is important for last stage bucket reliability. These materials must have adequate tensile and fatigue strength and be resistant to stress corrosion cracking and corrosion fatigue. It must also possess adequate toughness to tolerate potential bucket damage without risk of brittle fracture. The balance of material properties requires a careful selection of alloy chemistry and processing techniques. The new bucket uses the same high-strength, tough material, which has been proven by several thousand wheel-years of experience on the 23", 26", 30", and 33.5" last stage buckets.

Because last stage buckets operate with higher tip velocities in a moist steam environment, erosion of the bucket's leading edge occurs near the outer radial sections. To minimize the erosive effect of the collision between small moisture droplets and the bucket, a method of erosion protection must be provided. Stellite shields, brazed to the bucket vane provided this erosion control on the previous 20" last stage design. The redesigned 20" bucket uses a self-shielded design, which has been proven on the 23", 26", 30" and 33.5" modern buckets.

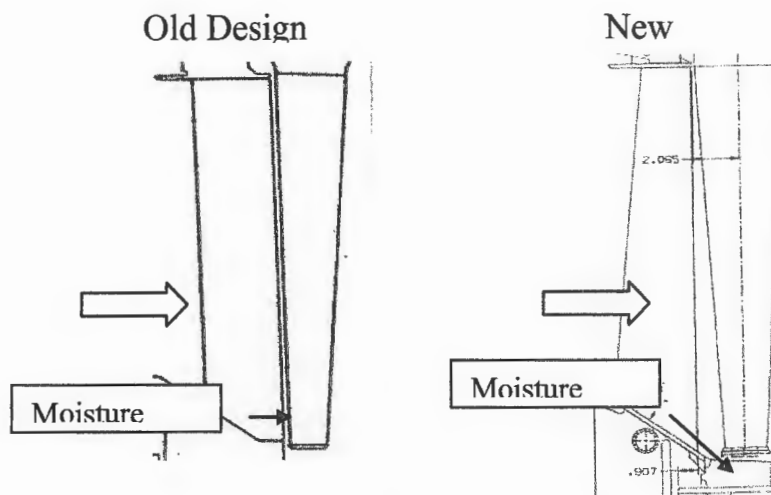
Extensive laboratory and service experience shows that the erosion resistance of the self-shielded design is comparable to that provided by Stellite. Strength tests of eroded bucket material in service environments show this material to have excellent properties for a last stage bucket environment.

### Summary of the New GE 20" Last Stage Bucket

In an effort to serve the power generation industry, GE continually investigates ways of improving turbine performance for new units while providing viable upgrading and life extension opportunities for existing units. The new 20-inch last stage offers owners these significant benefits of improved efficiency and reliability.

### New Overshoot Diaphragm Design Construction

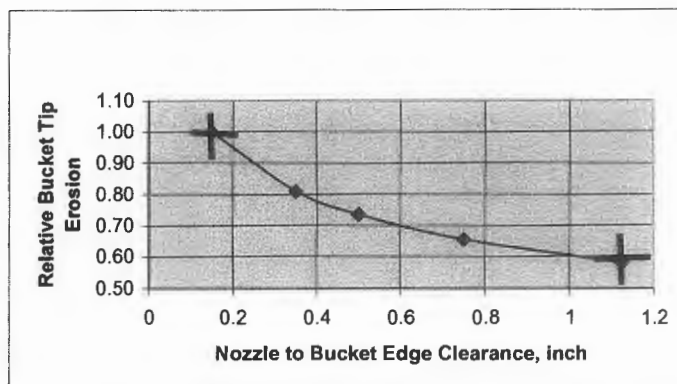
Modern GE diaphragm last stage designs utilize increased setback and 'ski jump' outer spacer band designs to deflect moisture away from bucket tip regions. Use of the closer-tip clearance diaphragms, like the original design, directly entered moisture to the last stage tip making the buckets more susceptible to impact erosion. See attached Figure 5 below for old vs. new generation designs.



**Figure 5 - Diaphragm Comparison**

With the new Shoot-Around nozzle designs, the moisture has to travel a longer distance enabling the radial steam force and ski-jump spacer band to deflect moisture around the bucket tip. On a calculated basis (Figure 5 New Design), erosion is reduced 42 % alone by use of the setback, ski-jump diaphragm vs. the original direct-impingement design.

Erosion Reduction =  $(1.0 - 0.58) / 1.0 = 42 \%$  (See Figure 6 for .58 value)



**Figure 6 - LSB Erosion Reduction Using New Generation Diaphragm**



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### 2. Heat Balance

HB1 - Heat Balance 1 – Original unit as new and clean (0% degradation)

OUTPUT, KW	49743			
HEAT RATE, BTU/(KW-HR)	11700			
	#/HR	PSIA	DEG F	BTU/#
HEAT SOURCE				
STEAM FROM BOILER	501900	614.7	750.0	1379.6
STEAM TO MAKEUP - H2O	12850			1379.6
STEAM TO STEAM SEAL SYSTEM	0			1379.6
FEEDWATER TO BOILER	514750		249.9	220.1
TURBINE				
STEAM TO THROTTLE	501900	614.7		1379.6
V1 HVS PKG. TO STEAM SEAL SYSTEM	675	16.7		1379.6
HP END PACKING				
LEAK FLOW TO STAGE 8 SHELL	2126	124.4		1359.1
SEAL FLOW TO STEAM SEAL SYSTEM	1053	16.7		1359.1
VENT FLOW TO GLD EXH MANIFOLD	74			1359.1
STAGE 6 EXTR TO 55.0 PSIA CONTROL	0	191.5		1273.9
STAGE 8 ADM FROM HP END PACKING	2126	124.4		1359.1
STAGE 8 EXTR TO 55.0 PSIA CONTROL	36400	124.4		1237.5
STAGE 14 ADM FROM LP END PACKING	291	1.7		1367.1
LP END PACKING				
SEAL FLOW FROM STEAM SEAL SYSTEM	457	16.7		1367.1
VENT FLOW TO GLD EXH MANIFOLD	166			1367.1
EXHAUST FLOW	411823	1.7	120.6	1002.0
FEEDWATER PUMP ( 75.0 PC EFF)				
FEEDWATER LEAVING	514750	768.4	249.9	220.1
FEEDWATER ENTERING	514750		248.4	217.0
MAKEUP - H2O				
FLOW FROM BOILER	12850			1379.6
FLOW TO MAKEUP WATER	12850	0.0		144.0
FLOW SOURCE CONTROL BASED ON 55.0 PSIA				
STEAM FROM STAGE 8 SHELL	36400	124.4		1237.5



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STEAM FROM STAGE 6 SHELL	0	191.5		1273.9
STEAM TO AIR HEATER	36400	115.7		1237.5
AIR HEATER				
FLOW FROM 55.0 PSIA CONTROL	36400			1237.5
FLOW TO MAKEUP WATER	36400	0.0		309.8
MAKEUP WATER				
FLOW FROM AIR HEATER	36400			309.8
FLOW FROM MAKEUP - H2O	12850			144.0
FLOW FROM GENERAL LOSSES	15450			144.0
EXCESS TO HEATER NO. 2	64700			237.3
HEATER NO. 2 (OPEN)				
TURBINE SHELL CONDITIONS		51.1	282.4	1171.3
EXTRACTION STEAM ( 7. PC DELTA P)	19002	29.0		1171.3
FLOW FROM MAKEUP WATER	64700			237.3
FEEDWATER LEAVING	514750	29.0	248.4	217.0
FEEDWATER ENTERING	431047		202.0	171.9
HEATER NO. 1 (CLOSED WITH D.C.)				
TURBINE SHELL CONDITIONS		14.3	210.7	1094.4
STEAM EXTRACTED FROM TURBINE	33160	14.3		1094.4
STEAM FROM STEAM SEAL SYSTEM	1271			1367.1
EXTRACTION STEAM ( 7. PC DELTA P)	34432	13.3		1104.5
FEEDWATER LEAVING ( 5. DEG TTD)	431047		202.0	171.9
FEEDWATER ENTERING DRAIN COOLER	431047		121.7	91.6
DRAINS LEAVING D.C. ( 10. DEG TD)	34432	13.3	131.7	99.7
FEEDWATER PUMP ( 75.0 PC EFF)				
FEEDWATER LEAVING	431047	768.4	121.7	91.6
FEEDWATER ENTERING	431047		120.6	88.5
STEAM SEAL SYSTEM				
MAKE UP FROM BOILER	0	0.0		1379.6
DUMP TO HEATER NO. 1 EXTR.	1271	14.3		1367.1
FLOW FROM V1 HVS PACKING	675	16.7		1379.6
FLOW FROM HP END PACKING	1053	16.7		1359.1
FLOW TO LP END PACKING	457	16.7		1367.1
GLD EXH MANIFOLD				
FLOW FROM HP END PACKING	74	14.5		1359.1
FLOW FROM LP END PACKING	166	14.5		1367.1





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GENERAL LOSSES				
FLOW FROM FW. BELOW HEATER 1	15450			88.5
FLOW TO MAKEUP WATER	15450	0.0		144.0
CONDENSER				
EXHAUST FLOW TO CONDENSER	411823	1.7		1002.0
FLOW FROM GLD EXH MANIFOLD	241	14.5		1364.6
FLOW FROM CUSTOMER LINE	0	1.7		0.0
DRAINS ENTERING	34432			
FEEDWATER LEAVING	446497	1.7	120.6	88.5



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### **3. Work-scope**

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The workscope described herein shall form the basis of the proposed work to be performed by GEI during the Pinellas County Turbine Generator #1 2016 outage. The work scope is based on the work needed to install the replacement steam path components and perform a major inspection on the turbine and auxiliaries only (no generator work).

#### **3.1 Mobilization**

- A. Mobilize / Site Preparation
  - 1. Set up storage space for tools, rigging, and equipment
  - 2. Locate and inspect special turbine tools (Pinellas County to provide tools supplied with unit)
  - 3. Set up rotor stands (Pinellas County to provide stands)
- B. Shut down and tag out all systems (GEI to tag out systems in conjunction with Pinellas County)
- C. Pinellas County to remove/re-install insulation on:
  - 1. Main Stop Valve cover
  - 2. Turbine Shell horizontal joint
  - 3. Control Valves
  - 4. Non-Return Valve covers
- D. Pinellas County to install scaffolding as needed for access to:
  - 1. Turbine shell bolt work
  - 2. All Non-return valve work
  - 3. Main Stop Valve work

#### **3.2 Turbine Casings**

- A. Remove upper half casing
- B. Clean, inspect, and record condition of:
  - 1. Upper and lower half casings
  - 2. Inlet flanges
  - 3. Horizontal joint
  - 4. Diaphragm fits



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5. Bolting
6. Spill strips
7. All shell fits
8. Packing fits
9. Struts
- C. 1<sup>st</sup> stage nozzle
  1. Remove nozzle plate, caulking strips, rings and holders and set aside in a laydown area designated by Pinellas County. Significantly frozen or stuck bolts that require destruction (with Pinellas County approval) of the hardware will be performed as Extra Work. Thread or hole restoration will also be performed as Extra Work.
  2. Install new 1st stage nozzle, caulking, steam shield and bolting that was provided with the replacement steam path components (lapping over one-shift, and any machining or scraping to achieve proper fit will be performed as extra work)
- D. Reinstall upper casing and bolt in place.
  1. Install a boring bar and machine up to .080" off of the seal faces on the last four stages in the LP casing.
  2. Machine exhaust casing to fit the new last stage diaphragm that is a shoot-around design.
  3. Remove upper casing.

### **3.3 Turbine Rotor**

- A. Record opening rotor clearances to stationary components.
- B. Remove rotor and set aside in stands in a laydown area designated by Pinellas County.
- C. Install new rotor for axial positioning of new nozzels & diaphragms
- D. Remove new turbine rotor
- E. Re-Install new turbine rotor after diaphragms have been machined and installed
- F. Record all packing clearances (radial/axial)
- G. Record all rotor/diaphragm clearances



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#### **3.4 Diaphragms**

- A. Remove diaphragms and set aside in a laydown area designated by Pinellas County.
- B. Pinellas County to ship new diaphragms to the GE Service Shop prior to the outage for axial position machining.
- C. Machine the new diaphragms to the measured axial position for each stage and ship to the PC plant. Fit axial clearances for each diaphragm to the casings.
- D. Install new stage 2-14 diaphragms that were provided with the steam path components and align with ERAG
- E. Install new stage 2-14 interstage packing, springs and mounting hardware that was provided with the steam path components
- F. If the machining & fitting of the new diaphragms & shell casing fits requires a patch ring, it will be considered extra work.

#### **3.5 Bearings**

- A. Remove bearing components
- B. Clean, inspect and record condition of:
  - 1. Journal bearing (T1 and T2 only)
    - a. Check clearances
    - b. Ball fits
    - c. Pinch check
    - d. Assemble bearings
  - 2. Thrust Bearing
    - a. Check clearance / stack check
    - b. Check parallelism
    - c. Assemble bearing

#### **3.6 Oil Deflectors**

- A. Remove oil deflectors (T1, T2 and thrust bearing only)
- B. Either install new oil deflectors provided by PC or clean, inspect and record condition of:
  - 1. Diametrical clearances



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- 2. Oil drains
- C. Install and align to rotor

### **3.7 Packings**

- A. Remove, note any unusual rubs and set aside in a laydown area designated by Pinellas County.
- B. Install new packing, springs and hardware that was provided with the steam path components.

**Note:** The new HP seal packing ring holder for rings R3 & R4 are designed to accommodate the change in shaft diameter for reduced thrust

### **3.8 Stop Valve**

- A. Disassemble
- B. Clean, inspect and record condition of:
  - 1. Seat / disc (NDE Using Dye Penetrant)
  - 2. Stem (NDE Using Dye Penetrant)
  - 3. Bolting (UT)
  - 4. Linkage
  - 5. Strainer (NDE Welds Only Using Dye Penetrant)
  - 6. Check seat to disc contact
- C. Disassemble, clean and inspect pilot valve
- D. Reassemble and install

### **3.9 Control Valve V1**

- A. Remove and disassemble Control Valve rack
- B. Clean, inspect and record condition of:
  - 1. Seats – (NDE Using Dye Penetrant)
  - 2. Discs – (NDE Using Dye Penetrant)
  - 3. Stems – (NDE Using Dye Penetrant)
  - 4. Springs
  - 5. Cam and bearings



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6. Cam followers and knock down pins
7. Disc / seat contact
8. Pinion / rack
9. Stem run out
- C. Remove the hydraulic cylinder and replace if necessary (Pinellas County to provide cylinder)
- D. Reassemble
- E. Adjust to control specifications

### **3.10 Non-Return Valve (6 total)**

- A. Disassemble
- B. Clean, inspect and and record condition of:
  1. Seat/disc (NDE Using Dye Penetrant)
  2. Perform disc to seat contact check (blue check or paper check).
  3. Linkage
  4. Inspect valve operator and replace seals. (Pinellas County to provide seals)
- C. Reassemble with new gaskets (PC to provide gaskets)
- D. Test for proper operation

### **3.11 Turbine Supervisory Instrumentation**

- A. Calibrate and test all gauges, pressure switches and alarms (PC to perform)

### **3.12 Lube Oil System**

#### **A.Oil tank**

1. Clean and inspect (PC to drain and fill)
2. Check all lines and connections
3. Rod clean water side, and inspect. (PC to dispose of waste water from cleaning and to provide new cooler gaskets and seals)
- B. Lube oil pumps (2 – AC, 1 – DC)
  1. Remove/Install motors (Pinellas County to disconnect/reconnect motors electrically)



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2. Remove and disassemble
3. Clean, inspect and record condition of:
  - a. Bushing/journals
  - b. Axial clearances
  - c. Impellers
  - d. Replace seals
  - e. Quill drive
4. Reassemble and install
- C. Inspect vapor extractor, verify proper alignment. PC to electrically disconnect and reconnect motor and send motor out for clean and inspect if required. (GEI will remove and reinstall motor)
- D. Perform flush of lube oil system using existing oil pumps. (If greater than 12 hours of flushing is required to bring system into GE specifications this will be performed on a T&M basis)

### **3.13 EHC System**

- A. Governing (non-GE control system)
  1. Perform diagnostic check (PC)
  2. Verify no faults or alarms (PC)
  3. Verify speed-sensing pickups are gapped properly and have proper signal (PC)
  4. Verify stop valve indications (PC)
  5. Adjust control valves for proper stroke and feedback (PC)
- B. Hydraulic Power Unit
  1. External inspection of Tank condition
  2. Fluid condition (Lab testing by (PC)
  3. Filters
  4. Relief valves
  5. Pump start and alarm switches
  6. Clean coolers by brushing tube IDs on water side only
  7. Check water regulator, gauges, air dryer; check air/oil relay and check accumulator charge (PC to provide charging hoses; bladder replacement would



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be extra work.)

C. EHC Pumps

1. Replace EHC pumps (PC to provide replacement pumps). Hand over the EHC pumps that were removed for Pinellas County to inspect or repair as desired.
- D. Perform flush of EHC oil system using existing oil pumps. PC to provide flushing valves. (If greater than 12 hours of flushing is required to bring system into GE specifications this will be performed on a T&M basis)

### **3.14 Oil Pump Test Runs**

- A. Prior to startup a test of all standby pumps are performed to check switchover, pressure drop, gauges, and the front standard. (Testing by Pinellas County)
- B. A DC pump run down is to be completed prior to the end of the outage. (Testing by PC)
- C. The following equipment is to be tested: (Testing by PC)
  1. Two AC Bearing oil pumps
  2. One DC Bearing oil pump
  3. Two EHC pumps
  4. Bearing Pressure Regulator

### **3.15 Gland Exhaust Sprays**

- A. Disassemble, clean, inspect and record condition of:
  1. Butterfly valves
  2. Spray nozzle (Pinellas County should have a spare spray nozzle in stock in case replacement is necessary)
- B. Assemble
- C. Adjust for operation

### **3.16 Turbine-Generator Coupling/Alignment**

- A. Disassemble for complete cleaning, inspection, testing, and recording condition of components.
- B. Inspect bolts, nuts, and locks (visual and NDT).
- C. Inspect rabbit fit (measure and record male and female).





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- D. Inspect coupling face.
- E. Inspect coupling bolt holes.
- F. Take rim and face runout readings.
- G. Perform a 4-point coupling alignment check prior to removing any rotor. Perform a 16-point coupling alignment check prior to reassembling the coupling. Compare to design and disassembly data. (Align to specifications provided by PC.)
- H. Reassemble the coupling and measure and record bolt elongation.
- I. Verify all locks in place, tabs bent and or covers installed and staked.

### **3.17 Demobilize**

- A. Pick up work area
- B. Demobilize
- C. Issue final report within 45 days



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## **4. OPTIONAL SCOPE**

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### **4.1 Lube Oil System High Velocity Flush**

A. If there are indications of significant contamination of the lube oil system, a high-velocity lube oil system flush may be recommended. This would involve a separate external pumping skid and the following equipment.

**Note:** The price given for the oil flush is based on flushing the system for 36 hours and includes an additional 12 hours for mobilize, setup, breakdown and demobilize. The price given for an extra day of flushing is on a per day (24 hours) basis.

B. Oil Flush Contractor to provide

1. High Velocity Flush pump (100 amps, 480 volts, 3 phase)
2. Filter Skid complete with filter media (36ea. filters cartridges included)
3. Reservoir oil heater (100 amps, 480 volts, 3 phase)
4. Stainless steel hoses for connection of flush equipment at main turbine oil tank
5. Filter Bags, 10-Micron for use at bearings (50ea. bags included)
6. Filter Bag housings for bearings as required
7. Stainless steel connection hoses for above housings as required
8. Bearing jumper fittings (flanges, pipes, valves, fittings, hoses)
9. Mechanical labor to install and remove temporary flush fixtures
10. Labor for surveillance and conducting the oil flush
11. Storage tanks for temporary storage of cleaned flush oil to prevent recontamination
12. Oil flush Manager to direct the oil flush, monitor and document status of oil flush and cleanliness
13. One (1) Oil flush mechanics/technicians
14. Laboratory, personnel and equipment for performing oil sample particle analysis to qualify unit to ISO 16/13
15. Transportation of equipment and personnel
16. Wiping rags, oil absorbent material, plastic sheeting materials



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#### C. PC to provide

1. Lifting and handling of equipment (overhead crane, fork lift, rigging etc.)
2. Necessary amounts of turbine oil for the flush
3. Timber for cribbing and plywood for floor and equipment protection as needed
4. Machine shop tools and operator if needed for special fixtures (drill press, lathe etc.)
5. Electrical labor for making electrical connections and maintaining service during flush
6. Means of disposal of any and all waste produced (oily rags, spent filters, waste oil, etc.)
7. Scaffolding and scaffold erection labor (if required)
8. 2 circuits of 100 amps, 480 volts, 3 phase power

## **4.2 Pre-Outage Station Performance Test**

The parameters of the optional Pre-outage Station Performance Test are laid out in Appendix 2 of this document.



## GE Power and Water Proposal

### 5. Proposal Basis

This proposal is based on the distribution of responsibilities between GE Energy Services and PC shown in the contract checklist, which follows, and additional assumptions and clarifications.

#### 5.1 Responsibilities

RESPONSIBILITIES	N/A	GEI	PC
1. Personal safety equipment .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Safety orientation for labor force .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3. Normal maintenance tools needed to perform "Workscope" described herein .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Special tools and equipment originally supplied with the unit .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Expendable materials (joint and bolt compounds, solvents, etc.).....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Expendable materials (rags, hones, etc.).....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. Acetylene and oxygen .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. Engine driven welding machine, leads & fuel (if needed).....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. Normal plant service required for maintenance such as light, heat, water, compressed air and electric power .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Wash facilities .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11. Sanitary facilities.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12. Change facilities for crew.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13. Parking for GEI's work force.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14. Office area with telephone and high speed internet connection for field engineers & crew foremen .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15. First aid facility & fire protection.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
16. Trash containers & disposal of all materials used .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
17. Supplementary lighting .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



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RESPONSIBILITIES	N/A	GEII	PC
18. Labor and equipment to disassemble, reassemble and calibrate instrumentation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
19. Electrical tests and necessary repairs on all electrical motors or power circuits.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20. Labor to disconnect and reconnect wiring & conduit necessary for disassembly/ reassembly.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
21. Plant electricians to disconnect, tag out and reconnect electrical apparatus.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
22. E&I personnel to assist GEII Controls, Excitation and Generator specialist as needed .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Isolate and tag out turbine-generator equipment.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
24. All turbine oil, greases and spare & renewal parts needed to complete "Workscope" .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
25. Component repair needed to complete "Workscope." Transportation to and from repair facility.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
26. Receiving, off-loading and proper storage of all new and refurbished parts.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
27. Representative scheduled concurrent with GEII crews to facilitate location of parts and other outage activities.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
28. Operational personnel to perform all normal functions of T-G equipment (shutdown, start-up, drain and fill oil systems, etc.).....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
29. Material and labor for removal and installation of insulation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
30. Protective coatings and heaters to maintain generator while disassembled.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
31. Crane with current inspection certificate. (Certificate of testing to be provided by customer prior to mobilization).....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
32. Designated work and laydown areas accessible to crane and turbine.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
33. Material for protection of laydown surfaces.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
34. Rotor supports and cribbing material for equipment requiring laydown .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
35. Machine shop facilities, on-site machining and painting as required .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>



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RESPONSIBILITIES	N/A	GEII	PC
36. Blast cleaning and non-destructive test services .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
37. Periodic electrical megger testing to monitor generator field condition during outage.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
38. All permits, licenses, governmental or public utility charges and inspection fees .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### 5.2 Assumptions and Clarifications

A. SAFETY: An "on-site" safety checklist will be utilized by GEII as a minimum for conformance to safety while on PC's property. Additionally, GEII will conform to PC's safety requirements for personal protective clothing and devices, such as safety glasses (side shields if required), hard hats, hand protection (gloves if required). Crane operator and/or rigger safety training to be provided by Pinellas County at no cost to GEII.

B. Sufficient spare and renewal parts will be on hand at the beginning of the outage as to prevent any delays resulting from repair or procurement time. All replacement parts will be provided by PC. MSDS sheets will be provided by GEII for all compounds, solvents, lubricants being brought on site

C. Pinellas County will be responsible for isolating all work areas from hazard (i.e., steam, electrical, and chemical) for the scope of GEII's work. PC will LOCKOUT-TAGOUT all systems associated with the GEII workscope.

D. In the case where it is found that welding, cutting, or grinding of material containing **Hexavalent Chromium** to be either directly or indirectly involved in the work as reflected in this proposal and which warrants procedures necessary to adhere to occupational and safety guidelines as outlined by local, state, and/or federal guidelines, the customer retains responsibility to reimburse GEII for such work at per firm price quote as extra work or subcontract the work to a third party at their discretion. Any additional exposure to direct or indirect costs to GEII scope attributable to addressing **Hexavalent Chromium** issues will be billed to the customer at time and material rates as reflected in this contract.

E. PC to certify all insulation and lagging that is in contact with items described in the above GE Workslope to be asbestos free. In the case where asbestos is found to be either directly or indirectly involved in the work as reflected in this proposal and which warrants procedures necessary to adhere to the occupational and safety guidelines as outlined by local, state, and/or federal guidelines, the customer retains responsibility to remove and dispose of the asbestos or subcontract the work to a third party at their discretion. If asbestos removal is required and will impact the Workslope then GEII will



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be entitled to an extension of the schedule and will be reimbursed for the delay on a time and material basis using the rates reflected in this contract.

F. It is assumed that no hazardous material will be encountered in performing the workscope. Disposal of any hazardous or regulated material will be the responsibility of PC.

G. In the case where lead is found to be either directly or indirectly involved in the work as reflected in this proposal and which warrants procedures necessary to adhere to occupational and safety guidelines as outlined by local, state, and/or federal guidelines, the customer retains responsibility to reimburse GEI for such work at a quoted firm price as extra work or subcontract the work to a third party at their discretion. Any additional exposure to direct or indirect costs to GEI scope attributable to addressing lead contamination issues will be billed to the customer at time and material rates as reflected in this contract.

H. All component repairs will be provided by PC, unless specifically included in workscope.

I. GEI shall furnish PC with a complete list of inspection results, including details of conditions found, corrective actions taken and unusual conditions observed, along with a list of parts expended during the inspection to include those recommended for the next inspection.

J. All material and/or parts that become a permanent part of the unit after installation will be furnished by PC unless specifically specified as being furnished/supplied by GEI in other parts of this quotation.

K. GEI and its workforce will utilize designated PC contractor personnel auto parking area.

L. PC to provide a certified crane of sufficient capacity to perform all lifting activities.

M. PC will provide shipping and insurance as needed for all items to be repaired.

N. Pinellas County will provide necessary staging/scaffolding and erection of same as required for performance of the workscope.

O. Drilling or tapping out of broken or seized fasteners larger than ½" (one half inch) will be performed as extra work.

P. Blue contact checks of any horizontal joints, if required, will be considered extra work.

Q. PC will provide special tooling as originally supplied with the turbine-generator set, including but not limited to generator skid pan, rotor shoe and turbine rotor stands.

R. PC to provide temporary electrical and air requirements: 40amp 220/440 v - three phase, 100 amp 440 v - single phase, 110 vac. Air requirements: 150 cfm @ 90 - 100 psi.



## **GE Power and Water Proposal**

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S. Inspection includes replacement of parts with new in kind parts provided by PC with no machining and minimal hand fitting to ensure fit and proper operation, where no out of scope disassembly is required.

T. Any delays to the work schedule on PC behalf will be invoiced at extra work rates for the amount of delayed time.

U. PC will provide lapping blocks and try bars (if required) for all valve work.

V. Valve seat lapping beyond 2 man-hours per valve will be handled as Extra Work on a time and material basis using the rates in Section 9.

W. PC to provide cribbing/blocking.

X. GEII will collect all chemicals and materials used in the performance of the inspection for disposal by PC.





## **GE Power and Water Proposal**

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### **6. PERFORMANCE GUARANTEE**

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This Performance Guarantee is made a part of Purchase Order No. \_\_\_\_\_ issued by Pinellas County ("Purchaser") to GE International Inc. ("Seller") with respect to purchase of equipment for use at Purchaser's facility. The Turbine Generator Uprate Project ("Equipment") described in Purchaser's Purchase Order No. \_\_\_\_\_ ("Purchase Order") shall, when maintained and used by Purchaser in accordance with Seller's written instructions, meet the Performance Criteria stated herein during a test ("Performance Test") to be conducted not more than four (4) weeks after the date of Purchaser's initial use of the Equipment.

#### **6.1 Performance Test**

The purpose of the post outage PTC6 Alternative Industrial thermal performance test will be to conduct a test measuring the thermal performance, correct the measured performance to specified contract conditions and compare the corrected performance to the guaranteed kW output.

#### **6.2 Performance Criteria**

##### **Guarantee Operating Point:**

The proposed steam turbine performance upgrade for the Purchaser's steam turbine with GE Serial number 197866 is designed for 600 psig / 750F throttle steam exhausting at 3.5" HgA. There are 4 uncontrolled extractions for feed water heating described in detail in Section 2 "Heat Balance". HB1 of Section 2 is the proposed guarantee performance.

For performance testing and uprate verification, Seller shall guarantee the T/G set output per the heat balance point, HB1 in Section 2 as agreed to by Seller and Purchaser. The steam conditions and flows are specified by the Purchaser. The Seller shall determine the generator output kWe including all internal turbine and generator losses based upon those specified flows and steam conditions. The GE guaranteed output shall be determined by utilizing the GE Integrated Design System computer program steam turbine model, which was used to calculate the guaranteed turbine capability as well as producing the thermodynamic correction curves.

##### **Performance Test Point:**

The Guarantee Point heat balance is HB1 described in Section 2 "Heat Balance". This is the same point to be used for performance verification. The Performance Test Point should include all the uncontrolled extractions to the steam heaters and the 65



## **GE Power and Water**

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psia Air Heater as specified in the Section 2 Heat Balance. The inlet and exhaust steam conditions and output are summarized below:

Inlet Pressure 600 psig

Inlet Temperature 750 F

Throttle Flow 501,900 pph

Exhaust Pressure 3.5" HgA

Output 49,743 kwe

### **6.3 Performance Test Conduct & Test Uncertainty**

The Post-Outage Performance Test shall be conducted within four (4) weeks following completion of the outage and subsequent startup of the steam turbine-generator unit for the purpose of demonstration of GE's Performance Guarantee. The Post-Outage Performance Test will be conducted by the Seller. The Seller shall provide assistance to the Purchaser in preparing the Test Procedures and witness the test.

This performance test will utilize station instrumentation. Temporary precision test instrumentation may be utilized to complement the station instrumentation at an additional cost to the Purchaser for the purpose of improving the overall test uncertainty.

The turbine / generator shall be deemed to have met guaranty performance if the generator electrical output at the generator terminals meets or exceeds the corrected load guaranty or does not vary from the corrected load guaranty by more than the post-outage test uncertainty.

The post-outage test uncertainty will be determined based upon the actual operating characteristics and test instrumentation that is used during the Post-Outage Performance Test. Performance Test uncertainty will be prepared during the development of the mutually agreed upon Test Procedure by the Purchaser using the guidelines established in ASME publication "Guidance for Evaluation of Measurement Uncertainty in Performance Tests of Steam Turbines" ANSI / ASME PTC 6 Report – 1985, and ASME PTC 19.1 "Test Uncertainty", a copy of which will be provided to PC.

A preliminary uncertainty analysis will be made prior to the conduct of the Tests during the Test Procedure preparation. Due to the importance of instrument repeatability to the uncertainty analysis, every effort should be made to minimize changes to all test instrumentation that will be used for the Test results



## **GE Power and Water**

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Should the turbine fail to meet the initial performance test, GE will be notified in writing within three (3) weeks after completion of the Post-Outage Performance Test stating that the Purchaser is claiming non-achievement of the Performance Guarantee.

#### **6.4 Performance Testing Scope (Conduct)**

GE will review station piping and instrumentation drawings to define instrumentation provision and cycle valve line-up list for the test.

GE will provide thermal performance personnel to provide technical direction for the conduct of the test and collection/analysis of test data.

GE Scope includes:

- Test Procedure
- Pre-Test walk-down to inspect flow elements, review test instrumentation, instrumentation provisions, and cycle-isolation.
- Analysis of Test Uncertainty
  - Quantify the test uncertainty based upon the available instrumentation provisions and the quality of instrumentation that will be used. Note: the level of test uncertainty will depend upon, but is not limited to, the quantity, location, caliber and type of instrumentation used for the Performance Test. This proposal assumes that the flow elements are permanently installed in the system and not provided by GE.
- Execution of Performance Test
- Test Report

#### **6.5 Instrumentation (Conduct)**

The test measurements will be collected using a combination of permanent station instrumentation and precision test instruments supplied by GE on a temporary basis. The instrumentation supplied by GE will be calibrated with standards traceable to U.S. NIST or equivalent standards and will be shipped to the project site by GE. The instruments included in this quotation will be provided for the prescribed period in Table A. After the prescribed time period has expired, instrumentation rental shall be billed separately as a percentage of the value of the instrumentation, per month or any part thereof. GE will provide the technical direction for the installation and removal of GE supplied test instruments. Depending on the existing station instrumentation provisions, it may be necessary to temporarily remove station



## **GE Power and Water Proposal**

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instrumentation to install test instruments. The installation of steam turbine test instruments and verification of station instrument calibration may require one twelve-hour shutdown. The removal of test instrumentation may require one four-hour shutdown (per unit), which should be scheduled for the day after the test and can occur during off-peak hours to minimize the impact on electricity generation.

It is the responsibility of the buyer to supply the appropriate flow measuring sections in the balance of plant piping to meet the target level of test uncertainty.

The measurements to be made with precision instrumentation include:

- Turbine Inlet Pressure/Temperature
- Extraction Pressures and Temperatures
- Turbine Exhaust Pressures
- Differential Pressure/Temperature associated with required flow measuring nozzles and orifices (Flow Nozzles & Orifices supplied by customer)
- Generator Output

This measurement list will be finalized after review of plant P&ID's.

Any additional instruments will be pre-approved by the Buyer and will be billed at Global Installation & Field Services Engineering rates.

### **6.6 Timing of the Post-Outage Performance Test**

As promptly as possible after Purchaser's initial use of the Equipment, but in no event more than four (4) weeks after such initial use, the Purchaser shall cause the Performance Test of the Equipment to be conducted to determine if the Equipment is capable of meeting the above-stated Performance Criteria. The Performance Criteria shall be deemed to have been met if:

(1) the equation in the "Comparison to Guaranty" section below is satisfied.

or

(2) the Performance Test cannot be conducted due to any reason beyond Sellers control within a period of ten (10) weeks after the date of Purchaser's initial use of the Equipment.

### **6.7 Seller's Responsibilities**

#### **Performance Map & Correction Curves:**



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The Seller shall provide as part of the requisition a thermodynamic "performance map" detailing the performance capability and limitations of the uprated turbine based upon the normal operating steam conditions as specified by Purchaser. The "Guaranteed Point" will be indicated on the map.

In conjunction with the performance map, the Seller shall provide as part of the requisition, thermodynamic correction curves that will be needed to correct the test results to the specified steam operating parameters. These correction curves shall be used to determine the warranted corrected power if the actual steam conditions are not equal to the specified normal operating conditions. Specifically, the correction curves will enable KWe corrections to throttle pressure and temperature, exhaust pressure, and extraction pressure.

#### **Comparison of Post-Outage Performance Test Results to Guarantee**

The Output Guaranty (kWe) shall be considered met if the measured output, after applying corrections to actual inlet/extraction/exhaust steam conditions and inlet/extraction flows, and adding the Post-outage Test Uncertainty, is equal to or greater than the warranted value.

#### **Corrected Test KWe + UKWe = or > Guaranteed Output KWe**

The term UKWe is the overall Post-Outage test uncertainty of the performance measurement due to instrument accuracy and operating conditions as determined by utilizing the guidelines established in ASME PTC 6-1996 and ANSI/ASME PTC 6R-1985, a copy of which will be provided to PC.

### **6.8 Buyer's Responsibilities**

- A. Supply flow measurement sections in balance of plant piping to meet target level of test uncertainty. Provide and install a primary flow section in the final feedwater section.
- B. Make the unit available for testing and operate as required.
- C. Furnish qualified labor including necessary foremen and superintendents for installation of test instruments and pre-test checks. The size and composition of the labor force shall be agreed upon by the parties prior to the start of testing activities and shall consist of the necessary crafts or trade to obtain optimum schedules.
- D. Notify GE of test date and required instrument on site date at least two months prior to such dates.



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- E. Confirmation of test date will be communicated to GE four weeks prior to start of performance test. Provide all necessary tools, equipment facilities (including a suitable office area with electricity, trailer, shelter or section of the construction housing area where drawings, special tools, and other Seller equipment can be kept and referred to or worked upon) and devices required for the safe handling, storage and installation of the test equipment.
- F. Provide, as required, operating personnel, compressed air, fuel, electric power, lubricant oil and supplies for starting, operating, and testing the steam turbine plant.
- G. Consult the GE Performance Personnel in advance with respect to the scheduling of all on site performance testing activities and to carry out such work so as to furnish the GE Performance Team adequate opportunity to inspect the work in progress during its regular working hours.
- H. Upon receipt of test equipment provide for, unloading, transporting, storage and protection of test equipment until required for installation. At least one day prior to installation of test instrumentation transport and place instrumentation in a safe area conveniently accessible to GE TPS personnel.
- I. Buyer will take all necessary precautions, at all times, for the safety of Seller personnel at site. This includes, but is not limited to, indoctrination of Buyer's safety practices, energization/de-energization of all power systems (electrical, mechanical and hydraulic) using a lock-out tag-out procedure.
- J. Climate-controlled and secure office and storage space adjacent to the work area at the Site. Buyer will supply phone lines, T-1 Line or equivalent for High Speed Data Communication, phone and fax service as required, in the office space. Site sanitary facilities (bathroom, washroom) will be supplied by the Buyer.
- K. Removal of test instrumentation upon completion of testing.

### **6.9 Remedies**

If the Post-Outage Performance Test results do not meet the Performance Criteria established above, the Purchaser will notify the Seller in writing within three (3) weeks after the conclusion of the Post-Outage Performance Test. At this point, the Purchaser will afford the Seller the opportunity to conduct a Diagnostic Performance test to better ascertain the cause(s) of Equipment not meeting Performance Criteria within three (3) weeks of notification from the Purchaser.

Upon the results of the Diagnostic Performance test, if Seller chooses to perform such a Diagnostic Performance test, the Seller has the option to propose a remedy or



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### **Proposal**

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reimburse to the Purchaser the sum of \$200 for each KW or fraction thereof that the actual performance is less than the warranted KW capacity at the test point as Liquidated Damage, not as Penalty. The maximum reimbursement for performance less than the warranty if acceptable to purchaser shall not exceed 5% of total Contract value.

This reimbursement shall be considered Liquidated Damages for GE not meeting its performance commitments and shall be in lieu of all actual damages. Liquidated Damages shall be Purchaser's sole and exclusive remedy and it shall relieve GE from all liability for any costs, losses, expenses, claims or penalties incurred by the Purchaser as a result of not meeting the guaranteed performance.

Conversely, if the Post-Outage Performance Test results exceed the Performance Criteria established above, the Seller shall receive from the Purchaser, as a bonus, the sum of \$200 for each KW or fraction thereof that the actual performance is greater than the warranted KW capacity at the test point as performance bonus. The maximum bonus received from the Purchaser shall not exceed 5% of total Contract value.

Terms and Conditions as specified by GE Proposal 197866 Rev 22, shall govern this Performance Guarantee.

#### **6.10 Schedule**

Any work to be performed in addition to that specified in this proposal will be billed on a Time and Material basis. Such charges will be applicable to:

- Training needed to gain access to the site
  - Any Buyer caused delays
- A. The Performance Evaluation/Testing services at the site shall commence on the date agreed upon by the parties. This proposal is based on a maximum number of trips to the site as listed in Table A.
- B. The price quoted includes the performance evaluation/testing services for up to, and no more than, the total number of days at site, listed in Table A, including testing and working one 12-hour shift(s) per day for consecutive days including weekends and holidays until the testing is completed. The number of Days on Site as listed in Table A does not include travel time.
- C. In the event the Buyer interrupts, extends, or accelerates the work, so as to require performance testing service at times other than provided in (B) above, the Seller reserves the right to render additional billing as follows:



## GE Power and Water Proposal

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- If the normal work schedule exceeds twelve hours per day, for the number of days prescribed in this proposal, the premium due the Seller will be 1.5 hours for each hour worked. In the event that the prescribed time on site is exceeded, the Buyer will be invoiced at Seller's published rates in effect at the time the work is performed. If the work schedule is interrupted, or extended beyond that established in the scope defined in this proposal, or if other services of the GE Performance team are required and not specifically provided for herein, such as, but not limited to, additional testing, or when the service is required during delays caused by the Buyer or others, or when the service is required during periods when work on the equipment is being performed by a labor force of less than adequate size and composition, commensurate with Paragraph C of "Buyer's Responsibilities" below, such services provided at times as provided in paragraph (B) above will be billed to the Buyer at the Seller's published rates in effect at the time the work is performed.
- If the performance test schedule is extended such that it exceeds the number of days listed in Table A for Performance Evaluation/Testing, then services in excess of stated period will be billed to the Buyer at the Seller's published rates in effect at the time the work is performed.
- If GE Performance Team is released from the site by the Buyer or demobilized from site due to site delays, while the testing is in progress but not complete, the same Performance personnel may not be available to return but will be replaced with qualified performance personnel.

D. Seller retains the option to replace the Performance Team at Seller's expense, and ensures orderly transfer of responsibilities.

The thermal performance test should be in accordance ASME PTC-6 (2004) (Alternative).  
Workscope for this service is listed in the outline below

**Table A**

Proposal Number	26009565	
Customer	Pinellas County	
Model	Industrial	S/N: 197866
Number of Units	1	
Number Days on Site	13 total (3 days site walkdown, 10 days post outage test)	@ 12 hrs/day, 1 shift
Type of Performance Test	Post Outage PTC6 Alternative Industrial Test	





## **GE Power and Water Proposal**

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Number Trips to Site	2 (1 site walkdown, 1 test)	
Number Months Equipment Rental	2	



## **GE Power and Water Proposal**

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### **7. TECHNICAL DIRECTION AND REPAIRS SCOPE OF WORK**

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#### **7.1 Field Services Scope of Work**

##### **Technical Direction of Installation (TDI)**

This service is defined as technical advice and counsel from field personnel based on good engineering, manufacturing, installation and operation practices as applicable to the equipment. Field Engineering Service does not include supervision or management of Buyer's employees, agents, or other contractors.

- Field Engineering Services (FES) includes up to 300 Straight-time man-hours on-site to provide technical direction for the installation of the new components.

#### **7.2 Service Shop Scope of Work**

Service Shop work includes the following:

- Diaphragm seal face machining (to be performed at a GE Service Shop)
- Nozzle plate machining (to be performed at a GE Service Shop)



## **GE Power and Water** **Proposal**

### **8. SCHEDULE and DELIVERIES**

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It is estimated that the standard engineering and manufacturing cycle time for the proposed turbine steam path modification, as described in Section 1, to be approximately 54 weeks exworks. These cycles do not include shipping and outage duration for implementation.

GELL optimizes schedules based upon your preferred mode of operation, and our experience in implementing and executing a project of this magnitude. The core work activities will be performed working up to two 12-hour shifts per day, 7 days per week. This work scope will be executed to optimum performance levels by utilizing our resources, and the support of Pinellas County coordinators.

For the purposes of this proposal, GELL is utilizing the following dates. This is a preliminary schedule intended to show estimated duration of 21 days to perform major inspection and steam path component replacement. Actual Outage dates will vary dependent upon receipt of order and delivery cycle of the new steam path.

<b>Mobilize</b>	March 28, 2016
<b>Work start date:</b>	April 4, 2016
<b>Work complete date:</b>	April 24, 2016
<b>Startup</b>	April 25, 2016

The main focus of the proposed on site work relating to the scope of supply indicated in Section 3 shall be performed working the following schedule:

<b>Hours per shift</b>	12
<b>Shifts per day</b>	2
<b>Days per week</b>	7

Startup coverage will be 1 field engineer, 1 foreman, 3 millwrights for 1 –12 hour shift.

The shifts may be adjusted during the outage as the workload activities dictate.

Crew size and composition will be set by GELL's discretion to best assure the outage schedules are met.

This proposal is based on the proposed work schedule. Deviation from this proposal resulting in work on holidays, unscheduled weekend or shift work will be charged on a time and material (T&M) basis per the rate schedule indicated in Section 5.

A final detailed work scope activity schedule will be agreed upon between GELL and PC after award and acceptance of contract

GE is committed to working with Pinellas County to achieve the shortest possible schedule to facilitate Pinellas County's outage plans.



## **GE Power and Water** *Proposal*

The estimated duration to perform major inspection and steam path component replacement is twenty-one (21) days. For the purposes of this proposal, the following definitions shall apply. Actual Outage dates to be mutually agreed upon.

**Mobilize Date** - shall be interpreted to mean the date that GEI arrives on site to prepare to complete the work.

**Work Start Date** - shall be interpreted to mean the date that GEI commences the major inspection and steam path component replacement scope as outlined in this proposal. This Work Start Date shall not be less than seven (7) days from Mobilize Date and shall not be earlier than sixty-two (62) weeks from receipt of order.

**Work Complete Date** - shall be interpreted to mean the date that the unit is assembled, on turning-gear, and ready for operation. The Work Complete Date shall be no less than twenty-one (21) days from the Work Start Date. Emergent or extra work shall extend the Work Complete Date by a mutually agreed to number of days.

**Liquidated Damages Start Date** - shall be interpreted to mean the date commencing nine (9) days after Work Complete Date.

If completion is delayed beyond the Work Complete Date and the delay is not due to causes excused by the provisions of the Contract or attributable to the County Of Pinellas then after receipt of notice by County Of Pinellas and commencing upon the Liquidated Damages Start Date, GEI shall pay County Of Pinellas as a reasonable prior estimate of damages and not as a penalty, a sum equal to \$100,000 per day for each day of delay in completion, up to an aggregate maximum of \$3,000,000. Notwithstanding the foregoing, in the event that the new steam path components cannot be installed on or before the Work Complete Date (in GE's reasonable business judgment), GEI may complete the major inspection, reinstall the existing steam path components and make the steam turbine available for the County of Pinellas to operate prior to the Work Complete Date. In the event of such reinstallation of the existing steam path components, GEI shall have no obligation to pay the foregoing amounts and the parties shall mutually agree on a new Work Start Date to complete the installation of the newly manufactured steam path components.



**GE Power and Water**  
**Proposal**

## **9. PRICING and PAYMENT**

### **9.1 Pricing**

The prices proposed within are in 2015 US Dollars, and do not include applicable sales, excise, value added, use or similar taxes. Pricing is valid for until February 26, 2015.

<b>Item</b>	<b>Qty</b>	<b>Description</b>	<b>Price</b>
1	1	Steam Path Replacement	<b>\$6,500,000</b>
2	Lot	Flow Parts : <ul style="list-style-type: none"><li>❑ New Oil deflectors # 1 &amp; 2 pedestals</li><li>❑ New coupling bolts and nuts</li><li>❑ Inactive &amp; Active thrust plates</li><li>❑ #1 radial bearing</li><li>❑ #2 radial bearing</li></ul>	<b>\$76,439</b>
3	1	Major Inspection and Steam Path Installation as described in Section 3.1-3.17	<b>\$428,500</b>

All prices are in U.S. dollars and do not include applicable sales, excise, value added, use, or similar taxes.

### **9.2 Optional Scope Pricing**

GEI is pleased to provide the optional work scope as indicated in the workscope under Section 4, per the responsibilities described in section 5 for the prices as shown in the table below:

<b>Item</b>	<b>Qty</b>	<b>Description</b>	<b>Price</b>
4	1	High velocity lube oil system flush as detailed in section 4.1 (36 hours of flushing plus mobilize/demobilize for 48 hours total)	<b>\$16,500</b>
5	1	Extra day of High Velocity Flushing if required (24 hours)	<b>\$8,000</b>
6	1	Provide crane services for the quoted workscope on a firm price basis.	<b>\$282,500</b>
7	1	Pre-Outage Performance Test (as described in Appendix 2)	<b>\$43,100</b>

**All prices are in U.S. dollars and do not include applicable sales, excise, value added, use, or similar taxes.**



## **GE Power and Water**

### **Proposal**

#### **9.3 Pricing Limitations**

Prices quoted herein are firm until February 26, 2015. GEl reserves the right to modify prices herein for work ordered after that date. This proposal is subject to change upon notice prior to executable order.

Shipping of the rotor to site is included in the offering price.

Parts and services subject to prior sale.

Partial shipments will be allowed.

#### **9.4 Payment - Terms and Schedule**

Payment is due 45 days from the invoice date. GE proposes these payment terms:

<u>Milestone</u>	<u>% of Contract</u>	<u>Estimated Date*</u>
At Contract February 26, 2015	15%**	On or before
Order Definition Meeting Complete	15%	4/3/2015
Stock Material Purchase	15%	5/1/2015
Component Machining Drawing Release	15%	7/1/2015
New Components Ready to Ship	25%	3/18/2016
Start Up or no later than 60 days after turning gear	15%	TBD

Invoices will be rendered upon shipment of parts and/or performance of services.

\*Dates are rough estimates assuming order receipt by February 26, 2015, the end of the validity period of this proposal, and an outage execution during 2Q2016. Proposed milestone percentages subject to change should the outage not occur in 2Q2016. Dates to be recast after actual purchase order receipt.

\*\*Payment received in advance of the full PO for the work-scope proposed herein will be deducted from the first milestone payment of 15%. That payment is the \$35,000 already made (reference Veolia PO 61196 issued June 30, 2011) to advance release a portion of the engineering on this project.

#### **9.5 Order Placement**

Upon the County of Pinellas' decision to purchase, please submit the purchase order to:

**General Electric International, Inc.**

Attn: Sales Manager James Heuker



## **GE Power and Water**

### **Proposal**

501 East Kennedy, suite 600  
Tampa, FL 33602  
Ph: 813-286-4886  
Fx: 813-286-4808  
Email: [James.Heuker@ge.com](mailto:James.Heuker@ge.com)

## **9.6 Invoicing Methods**

Unless mutually agreed otherwise, GE shall submit invoices to customer by e-mail, and if customer so requests then GE shall also provide to customer a paper invoice by regular mail. As an alternative, GE may submit paper invoices by overnight express mail to customer's street address. Customer shall be deemed to have received each invoice as of the date of customer's receipt of the e-mail or overnight express mail, as applicable.

Unless mutually agreed otherwise, customer shall make payments to GE by electronic wire transfer. GE's wire transfer information is provided below.

Deutsche Bank Trust (Wire Transfers)  
Swift Acct: BKTRUS33  
ABA 021001033  
Acct# 50272119  
Acct Name: **General Electric International, Inc.**

## **9.7 Cancellation Terms**

GE proposes the cancellation terms below:

<u>Milestone</u>	<u>% of Contract</u>
At Contract	10%
Order Definition Meeting Complete	25%
Stock Material Purchase	45%
Component Machining Drawing Release	65%
Ship New Components	100%

## **9.8 Terms and Conditions**

This proposal is based upon the following terms enclosed in the Appendix:



## **GE Power and Water**

### **Proposal**

**1). Terms and Conditions for Sale of Products and Services Form ES 104 (Rev. 4), Mutually Revised and Agreed to by GEI and Pinellas County on January 30, 2015, solely for the Supply of Products and Services as per Proposal 197866, Rev. 22 dated January 30, 2015.**

**2). State and Local Government Addendum [Florida]**

## **9.9 Extra Work**

GE will provide Services (Technical Support and/or Craft Labor) for PC requested emergent or additional work that is in excess of the firm price workscope detailed in Section 3. The additional work will be quoted as a lump sum firm price upon agreement of scope.

Out of scope work (extra work) is defined as any work not specifically called for in GEI's proposal and will be formally agreed to by PC and GEI before it is performed.

In the event Extra Work is necessary during the performance of the workscope, the Extra Work would be performed on a lump sum firm price basis for which a quote will be provided as needed. In the event that Extra Work requires the skills of a specialist, craftsman or technician for which Extra Work rates are not included in this quote, the Extra Work hourly rates will be provided as needed.

No Extra Work will be performed without the prior authorization of the designated Pinellas County representative. Extra work authorization will be in written format prior to start of any Extra Work. PC will delegate personnel responsible for authorizing Extra Work.

The following is an example of, but not limited to, Extra Work items:

- A. Any necessary work not specified in the workscope (Section 3) of this proposal.
- B. Loss of productivity due to any/all PC delays.
- C. Start-up support (craft and supervision) beyond that outlined under the workscope (Section 3).
- D. Honing or lapping of shell joints, valve bushings, or valve seats.
- E. Any fluid flushes beyond those specified in the workscope.
- F. Any repairs determined to be necessary during the inspection.

GEI observed holidays include New Year's Day, Martin Luther King, Jr. Day, Presidents' Day, Good Friday, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, Day after Thanksgiving, Christmas Eve, Christmas Day.

The General Electric Field Engineering Service Hourly Rates and Repair Service Shop Rates shown below are for reference only. The rates that are in effect at the time the work is performed will apply.





## GE Power and Water Proposal

### GE Power & Water

United States

Effective:

January 1, 2015

### Installation Services for GE Heavy Duty Gas and Steam Turbine New Equipment

#### Rates U.S. Dollar

#### GE Field Engineering Service Description Rate

Installation Service \$ 470/hour  
Power Answer Center \$ 3,300/case

#### Technical Direction of Installation

Technical Direction of Installation is defined as technical advice and counsel from GE Technical Advisors based on good engineering, manufacturing, installation and operation practices as applicable to new GE supplied equipment.

This service includes all lead field engineering and advisory responsibilities including organizing, integrating and monitoring of GE resources. To the extent specified in the contract, such services may also include testing, adjustment, programming and other similar services.

Technical Direction of Installation does not include supervision nor management of Buyer's employees, agents, or other contractors.

#### Commission Performance Testing

Thermal performance testing services includes new unit contractual acceptance testing, plant performance optimization, regulatory compliance, and baseline testing for monitory and trending purposes.

#### Technical Training

GE's Energy Learning Center provides highly skilled, experienced instructors with extensive engineering, operations and maintenance backgrounds to train the Buyer's staff proper operation and maintenance of the new GE supplied equipment.

The training curriculum can be site-specific and can either be at GE's facility or at the Buyer's site.

#### Power Answer Center

This service includes product technical support, including historical records, fleet data, unit-specific drawings, and operational or component disposition on GE supplied equipment.

#### Rate Terms

1. The normal workday and normal workweek are defined as eight (8) consecutive hours and five (5) consecutive normal workdays, respectively, excluding any holidays or weekends.

Normal	1.00 x Standard Rate
Overtime 1	1.50 x Standard Rate
Overtime 2	2.00 x Standard Rate
Peak	1.20 x Applicable Rate
<48 hour notice	1.30 x Applicable Rate

2. Overtime 1 multiplier applies to billable hours on Saturday and normal workday hours greater than 8 hours but less than 12 consecutive hours.

3. Overtime 2 multiplier applies to billable hours on Sunday, holidays, and normal workday hours greater than 12 consecutive hours.

4. Peak multiplier applies to billable hours at the applicable rate from March 2<sup>nd</sup> to May 10<sup>th</sup> and September 28<sup>th</sup> to November 8<sup>th</sup>. When committed 60 days or earlier before start of Peak Period (date), the peak adder can be waived.

5. Travel time will be charged at the applicable hourly rate (i.e., standard rate times applicable multiplier(s) as set forth in 1 above) on a round trip basis with point of departure based on the location of the GE representative's office/service center.

6. Travel and living expenses will be billed at a cost plus 20% minimum, or consult with your local GE Power & Water representative for a local per diem rate.

7. Purchased labor and materials will be billed at a cost plus 30% minimum.

8. Consult with your local GE Power & Water representative to determine any applicable charges for special tooling and/or test equipment or any taxes, fees or VAT that may be in addition to the above rates.





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**Proposal**

**GE Power & Water**

**United States**

**Effective:**

**January 1, 2015**

**Page 2**

**Installation Services for GE Heavy Duty Gas and Steam Turbine New Equipment**

**Rate Terms (continue)**

9. Minimum billing of 8 hours for all services provided, including standby time.

10. All rates are based on GE's standard terms and conditions of sale (Form ES 104)



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#### **Craft Labor Rates for Extra Work**

Note: These rate are for reference only, the current rates in affect at the time the work is performed will apply.

<b>Craft Classification</b>	<b>Shift</b>	<b>ST</b>	<b>OT</b>	<b>DT</b>
Key Foreman	D	73.00	100.93	128.80
Key Journeyman	D	69.36	95.58	121.79
Journeyman	D	64.77	89.04	113.30
Key Foreman	N	73.94	102.27	130.58
Key Journeyman	N	70.27	96.93	123.55
Journeyman	N	65.66	90.34	115.00

*If other crafts or shifts are required, rates will be supplied at time of request. These rates are for budgetary purposes.*

**Per Diem is applied on a 7-day basis while the outage is in progress.** GEII reserves the right, with Pinellas County consent, to change the per diem rates according to market lodging conditions.

Straight time hourly rates will apply for work performed during the first eight hours of an individual's working day on Monday through Friday, except observed holidays.

Weekday overtime and Saturday hourly rates will apply for work performed in excess of eight hours of combined work on Monday through Friday, except observed holidays, and for work performed during the first twelve hours on a Saturday, which is not an observed holiday.

Double time hourly rates will apply for work performed on Sundays and holidays.  
Travel for Superintendent is defined as follows:

- All Superintendents are issued company cars and no mileage charges apply. In the event that a Superintendent needs to use a personal vehicle, a charge of \$0.66 per/mile for travel in/out plus any other business related miles would apply.
- Travel: Actual travel time in and out billed at the straight time rate.

#### **Rentals & Subcontractor Services**

Rental and subcontractor services required for extra work can be quoted at a firm price or customer can subcontract the work to a third party at their discretion.



**GE Power and Water**  
*Proposal*

## **10. APPENDIX**

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**Appendix 1 - Terms and Conditions**

**Appendix 2 – Pre-Outage Station Performance Testing**



## **GE Power and Water** **Proposal**

### **Appendix 1**

**Terms and Conditions for Sale of Products and Services Form ES 104 (Rev. 4), Mutually Revised and Agreed to by GEIL and Pinellas County on January 30, 2015, solely for the Supply of Products and Services as per Proposal 197866, Rev. 22 dated January 30, 2015.**

NOTICE: Sale of any Products or Services is expressly conditioned on Buyer's assent to these Terms and Conditions. Any acceptance of Seller's offer is expressly limited to acceptance of these Terms and Conditions and Seller expressly objects to any additional or different terms proposed by Buyer. No facility entry form shall modify these Terms and Conditions even if signed by Seller's representative. Any order to perform work and Seller's performance of work shall constitute Buyer's assent to these Terms and Conditions. Unless otherwise specified in the quotation, Seller's quotation shall expire 30 days from its date and may be modified or withdrawn by Seller before receipt of Buyer's conforming acceptance.

#### **1. Definitions**

"Buyer" means the entity to which Seller is providing Products or Services under the Contract.

"Contract" means either the contract agreement signed by both parties, or the purchase order signed by Buyer and accepted by Seller in writing, for the sale of Products or Services together with these Terms and Conditions, Seller's final quotation, the agreed scope(s) of work, and Seller's order acknowledgement. In the event of any conflict, the Terms and Conditions shall take precedence over other documents included in the Contract.

"Contract Price" means the agreed price stated in the Contract for the sale of Products and Services, including adjustments (if any) in accordance with the Contract.

"Hazardous Materials" means any toxic or hazardous substance, hazardous material, dangerous or hazardous waste, dangerous good, radioactive material, petroleum or petroleum-derived products or by-products, or any other chemical, substance, material or emission, that is regulated, listed or controlled pursuant to any national, state, provincial, or local law, statute, ordinance, directive, regulation or other legal requirement of the United States ("U.S.") or the country of the Site.

"Insolvent/Bankrupt" means that a party is insolvent, makes an assignment for the benefit of its creditors, has a receiver or trustee appointed for it or any of its assets, or files or has filed against it a proceeding under any bankruptcy, insolvency dissolution or liquidation laws.

"Products" means the equipment, parts, materials, supplies, software, and other goods Seller has agreed to supply to Buyer under the Contract.

"Seller" means the entity providing Products or performing Services under the Contract.

"Services" means the services Seller has agreed to perform for Buyer under the Contract.

"Site" means the premises where Products are used or Services are performed, not including Seller's premises from which it performs Services.

"Terms and Conditions" means these "Terms and Conditions for Sale of Products and Services", including any relevant addenda pursuant to Article 18, together with any modifications or additional provisions specifically stated in Seller's final quotation or specifically agreed upon by Seller in writing.

#### **2. Payment**

2.1 Except as otherwise provided in the Contract, Buyer shall pay Seller for the Products and Services by paying all invoiced amounts in U.S. dollars, without set-off for any payment from Seller not due under this Contract, within forty-five (45) days from the invoice date. Except as otherwise provided in the Contract, If the Contract Price is U.S. Two Hundred Fifty Thousand Dollars (\$250,000) or more, progress payments shall be invoiced starting with twenty-five percent (25%) of the Contract Price for Products and Services upon the earlier of Contract signature or issuance of Seller's order acknowledgement and continuing such that ninety percent (90%) of the Contract Price for Products and Services are invoiced as performed ("Progress Payments"). All invoicing and payment shall be in accordance with the Local Government Prompt Payment Act, F.S. 218.70 et seq.

2.2 [Intentionally Omitted For The Purposes Of This Contract]



## **GE Power and Water**

### **Proposal**

2.3 Seller is not required to commence or continue its performance unless and until all applicable Progress Payments have been received. For each day of delay in receiving Progress Payments, Seller shall be entitled to a matching extension of the schedule. If at any time Seller reasonably determines that Buyer's financial condition or payment history does not justify continuation of Seller's performance, Seller shall be entitled to require full or partial payment in advance or otherwise restructure payments, suspend its performance or terminate the Contract.

### **3. Taxes and Duties**

Seller shall be responsible for all corporate taxes measured by net income due to performance of or payment for work under this Contract ("Seller Taxes"). Except to the extent that Buyer is exempt from taxes, Buyer shall be responsible for all taxes, duties, fees, or other charges of any nature (including, but not limited to, consumption, gross receipts, import, property, sales, stamp, turnover, use, or value-added taxes, and all items of withholding, deficiency, penalty, addition to tax, interest, or assessment related thereto, imposed by any governmental authority on Buyer or Seller or its subcontractors) in relation to the Contract or the performance of or payment for work under the Contract other than Seller Taxes ("Buyer Taxes"). The Contract Price does not include the amount of any Buyer Taxes. If Buyer deducts or withholds Buyer Taxes, Buyer shall pay additional amounts so that Seller receives the full Contract Price without reduction for Buyer Taxes. Buyer shall provide to Seller, within one month of payment, official receipts from the applicable governmental authority for deducted or withheld taxes. Pinellas County will provide Seller with a tax exemption certificate for sales tax due on services, materials or equipment.

### **4. Deliveries; Title Transfer; Risk of Loss; Storage**

4.1 Seller shall deliver Products to Buyer FCA Seller's facility or warehouse (Incoterms 2010). Buyer shall pay all delivery costs and charges or pay Seller's standard shipping charges plus up to twenty-five (25%) percent. Partial deliveries are permitted. Seller may deliver Products in advance of the delivery schedule. Delivery times are approximate and are dependent upon prompt receipt by Seller of all information necessary to proceed with the work without interruption. If Products delivered do not correspond in quantity, type or price to those itemized in the shipping invoice or documentation, Buyer shall so notify Seller within ten (10) days after receipt.

4.2 For shipments that do not involve export, title to Products shall pass to Buyer upon delivery in accordance

with Section 4.1. For export shipments from a Seller facility or warehouse outside the U.S., title shall pass to Buyer upon delivery in accordance with Section 4.1. For shipments from the U.S. to another country, title shall pass to Buyer immediately after each item departs from the territorial land, seas and overlying airspace of the U.S. The 1982 United Nations Convention of the law of the Sea shall apply to determine the U.S. territorial seas. For all other shipments, title to Products shall pass to Buyer the earlier of (i) the port of export immediately after Products have been cleared for export or (ii) immediately after each item departs from the territorial land, seas and overlying airspace of the sending country. When Buyer arranges the export or intercommunity shipment, Buyer will provide Seller evidence of exportation or intercommunity shipment acceptable to the relevant tax and custom authorities. Notwithstanding the foregoing, Seller grants only a license, and does not pass title, for any software provided by Seller under this Contract, and title to any leased equipment remains with Seller.

4.3 Risk of loss shall pass to Buyer upon delivery pursuant to Section 4.1, except that for export shipments from the U.S., risk of loss shall transfer to Buyer upon title passage.

4.4 If any Products to be delivered under this Contract or if any Buyer equipment repaired at Seller's facilities cannot be shipped to or received by Buyer when ready due to any cause attributable to Buyer or its other contractors, Seller may ship the Products and equipment to a storage facility, including storage at the place of manufacture or repair, or to an agreed freight forwarder. If Seller places Products or equipment into storage, the following apply: (i) title and risk of loss immediately pass to Buyer, if they have not already passed, and delivery shall be deemed to have occurred; (ii) any amounts otherwise payable to Seller upon delivery or shipment shall be due; (iii) all expenses and charges incurred by Seller related to the storage shall be payable by Buyer upon submission of Seller's invoices; and (iv) when conditions permit and upon payment of all amounts due, Seller shall make Products and repaired equipment available to Buyer for delivery.

4.5 If repair Services are to be performed on Buyer's equipment at Seller's facility, Buyer shall be responsible for, and shall retain risk of loss of, such equipment at all times, except that Seller shall be responsible for damage to the equipment while at Seller's facility to the extent such damage is caused by Seller's negligence.

### **5. Warranty**

5.1 Seller warrants that Products shall be delivered free from defects in material, workmanship and title and that



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Services shall be performed in a competent, diligent manner, all in accordance with any mutually agreed specifications contained in the Contract.

5.2 The warranty for Products shall expire one (1) year from first use or eighteen (18) months from delivery, whichever occurs first, except that software is warranted for ninety (90) days from delivery. The warranty for Services shall expire one (1) year after performance of the Service, except that software-related Services are warranted for ninety (90) days.

5.3 If Products or Services do not meet the above warranties, Buyer shall promptly notify Seller in writing prior to expiration of the warranty period. Seller shall (i) at its option, repair or replace defective Products and (ii) re-perform defective Services. If despite Seller's reasonable efforts, a non-conforming Product cannot be repaired or replaced, or non-conforming Services cannot be re-performed, Seller shall refund or credit monies paid by Buyer for such non-conforming Products and Services. Warranty repair, replacement or re-performance by Seller shall not extend or renew the applicable warranty period. Buyer shall obtain Seller's agreement on the specifications of any tests it plans to conduct to determine whether a nonconformance exists.

5.4 Buyer shall bear the costs of access for Seller's remedial warranty efforts (including removal and replacement of systems, structures or other parts of Buyer's facility), de-installation, decontamination, re-installation and transportation of defective Products to Seller and back to Buyer, unless Seller originally provided such scope in the Contract, in which case Seller shall be responsible for that specific scope in its warranty remedy.

5.5 The warranties and remedies are conditioned upon (a) proper storage, installation, use, operation, and maintenance of Products, (b) Buyer keeping accurate and complete records of operation and maintenance during the warranty period and providing Seller access to those records, and (c) modification or repair of Products or Services only as authorized by Seller in writing. Failure to meet any such conditions renders the warranty null and void. Seller is not responsible for normal wear and tear.

5.6 This Article 5 provides the exclusive remedies for all claims based on failure of or defect in Products or Services, regardless of when the failure or defect arises, and whether a claim, however described, is based on contract, warranty, indemnity, tort/extra-contractual liability (including negligence), strict liability or otherwise. The warranties provided in this Article 5 are exclusive and are in lieu of all

other warranties, conditions and guarantees whether written, oral, implied or statutory. NO IMPLIED OR STATUTORY WARRANTY, OR WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE APPLIES.

#### **6. Confidentiality**

6.1 Seller and Buyer (as to information disclosed, the "Disclosing Party") may each provide the other party (as to information received, the "Receiving Party") with Confidential Information in connection with this Contract. "Confidential Information" means (a) information that is designated in writing as "confidential" or "proprietary" by Disclosing Party at the time of written disclosure, and (b) information that is orally designated as "confidential" or "proprietary" by Disclosing Party at the time of oral or visual disclosure and is confirmed to be "confidential" or "proprietary" in writing within twenty (20) days after the oral or visual disclosure. In addition, prices for Products and Services shall be considered Seller's Confidential Information.

6.2 Receiving Party agrees: (i) to use the Confidential Information only in connection with the Contract and use of Products and Services, (ii) to take reasonable measures to prevent disclosure of the Confidential Information to third parties, and (iii) not to disclose the Confidential Information to a competitor of Disclosing Party. Notwithstanding these restrictions, (a) Seller may disclose Confidential Information to its affiliates and subcontractors in connection with performance of the Contract, (b) a Receiving Party may disclose Confidential Information to its auditors, (c) Buyer may disclose Confidential Information to lenders as necessary for Buyer to secure or retain financing needed to perform its obligations under the Contract, and (d) a Receiving Party may disclose Confidential Information to any other third party with the prior written permission of Disclosing Party, and in each case, only so long as the Receiving Party obtains a non-disclosure commitment from any such subcontractors, auditors, lenders or other permitted third party that prohibits disclosure of the Confidential Information and provided further that the Receiving Party remains responsible for any unauthorized use or disclosure of the Confidential Information. Receiving Party shall upon request return to Disclosing Party or destroy all copies of Confidential Information except to the extent that a specific provision of the Contract entitles Receiving Party to retain an item of Confidential Information. Each Party may also retain one archive copy of the other Party's Confidential Information.

6.3 The obligations under this Article 6 shall not apply to any portion of the Confidential Information that: (i) is or becomes



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generally available to the public other than as a result of disclosure by Receiving Party, its representatives or its affiliates; (ii) is or becomes available to Receiving Party on a non-confidential basis from a source other than Disclosing Party when the source is not, to the best of Receiving Party's knowledge, subject to a confidentiality obligation to Disclosing Party; (iii) is independently developed by Receiving Party, its representatives or affiliates, without reference to the Confidential Information; (iv) is required to be disclosed by law or valid legal process, including disclosure by the County under the Florida Public Records Act, provided that the Receiving Party intending to make disclosure in response to such requirements or process shall promptly notify the Disclosing Party in advance of such disclosure and reasonably cooperate in attempts to maintain the confidentiality of the Confidential Information.

6.4 Each Disclosing Party warrants that it has the right to disclose the information that it discloses. Neither Buyer nor Seller shall make any public announcement about the Contract without prior written approval of the other party. As to any individual item of Confidential Information, the restrictions under this Article 6 shall expire five (5) years after the date of disclosure. Article 6 does not supersede any separate confidentiality or nondisclosure agreement signed by the parties.

#### **7. Intellectual Property**

7.1 Seller shall defend and indemnify Buyer against any claim by a non-affiliated third party (a "Claim") alleging that Products or Services furnished under this Contract infringe a patent in effect in the U.S., an EU member state or the country of the Site (provided there is a corresponding patent issued by the U.S. or an EU member state), or any copyright or trademark registered in the country of the Site, provided that Buyer (a) promptly notifies Seller in writing of the Claim, (b) makes no admission of liability and does not take any position adverse to Seller, (c) gives Seller sole authority to control defense and settlement of the Claim, and (d) provides Seller with full disclosure and reasonable assistance as required to defend the Claim.

7.2 Section 7.1 shall not apply and Seller shall have no obligation or liability with respect to any Claim based upon (a) Products or Services that have been modified, or revised, (b) the combination of any Products or Services with other products or services when such combination is a basis of the alleged infringement, (c) failure of Buyer to implement any update provided by Seller that would have prevented the Claim, (d) unauthorized use of Products or Services, or (e) Products or Services made or performed to Buyer's specifications.

7.3 Should any Product or Service, or any portion thereof, become the subject of a Claim, Seller may at its option (a) procure for Buyer the right to continue using the Product or Service, or applicable portion thereof, (b) modify or replace it in whole or in part to make it non-infringing, or (c) failing (a) or (b), take back infringing Products or Services and refund the price received by Seller attributable to the infringing Products or Services.

7.4 Article 7 states Seller's exclusive liability for intellectual property infringement by Products and Services.

7.5 Each party shall retain ownership of all Confidential Information and intellectual property it had prior to the Contract. All new intellectual property conceived or created by Seller in the performance of this Contract, whether alone or with any contribution from Buyer, shall be owned exclusively by Seller. Buyer agrees to deliver assignment documentation as necessary to achieve that result.

#### **8. Indemnity**

[Intentionally Omitted For The Purposes Of This Contract]

#### **9. Insurance**

[Intentionally Omitted For The Purposes Of This Contract]

#### **10. Excusable Events**

Seller shall not be liable or considered in breach of its obligations under this Contract to the extent that Seller's performance is delayed or prevented, directly or indirectly, by any cause beyond its reasonable control, or by armed conflict, acts or threats of terrorism, epidemics, strikes or other labor disturbances, or acts or omissions of any governmental authority or of the Buyer or Buyer's contractors or suppliers. If an excusable event occurs, the schedule for Seller's performance shall be extended by the amount of time lost by reason of the event plus such additional time as may be needed to overcome the effect of the event. If acts or omissions of the Buyer or its contractors or suppliers cause the delay, Seller shall also be entitled to an equitable price adjustment.

#### **11. Termination and Suspension**

11.1 Buyer may terminate the Contract (or the portion affected) for cause if Seller (i) becomes Insolvent/Bankrupt, or (ii) commits a material breach of the Contract which does not otherwise have a specified contractual remedy, provided that: (a) Buyer shall first provide Seller with detailed written notice of the breach and of Buyer's intention to terminate the Contract, and (b) Seller shall have failed, within 30 days after





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receipt of the notice, to commence and diligently pursue cure of the breach.

11.2 If Buyer terminates the Contract pursuant to Section 11.1, (i) Seller shall reimburse Buyer the difference between that portion of the Contract Price allocable to the terminated scope and the actual amounts reasonably incurred by Buyer to complete that scope, and (ii) Buyer shall pay to Seller (a) the portion of the Contract Price allocable to Products completed, (b) lease fees incurred, and (c) amounts for Services performed before the effective date of termination. The amount due for Services shall be determined in accordance with the milestone schedule (for completed milestones) and rates set forth in the Contract (for work toward milestones not yet achieved and where there is no milestone schedule), as applicable or, where there are no milestones and/or rates in the Contract, at Seller's then-current standard time and material rates.

11.3 Seller may suspend or terminate the Contract (or any affected portion thereof) for cause if Buyer (i) becomes Insolvent/Bankrupt, or (ii) materially breaches the Contract, including, but not limited to, failure to make any payment when due, or fulfilling any payment conditions, provided that: (a) Seller shall first provide Buyer with detailed written notice of the breach and of Seller's intention to terminate the Contract, and (b) Buyer shall have failed and fails to cure the breach within thirty (30) days of notice from the Seller, or if it is not possible to cure such breach within thirty (30) days of such notice, fails to commence to cure the breach within thirty (30) days or fails to thereafter continue diligent efforts to complete the cure as soon as reasonably possible. Failure to make a payment required by this Agreement is a material breach.

11.4 If the Contract (or any portion thereof) is terminated for any reason other than Seller's default under Section 11.1, Buyer shall pay Seller for all Products completed, lease fees incurred and Services performed before the effective date of termination, plus expenses reasonably incurred by Seller in connection with the termination. The amount due for Services shall be determined in accordance with the milestone schedule (for completed milestones) and rates set forth in the Contract (for work toward milestones not yet achieved and where there is no milestone schedule), as applicable or, where there are no milestones and/or rates in the Contract, at Seller's then-current standard time and material rates. In addition, Buyer shall pay Seller a cancellation charge in accordance with Seller's proposal 197866 Rev 11, Section 6.5 under "Pricing and Payment."

11.5 Either Buyer or Seller may terminate the Contract (or the portion affected) upon twenty (20) days advance notice if there is an excusable event (as described in Article 10) lasting longer than one hundred and twenty (120) days. In such case, Buyer shall pay Seller amounts payable under Section 11.4, excluding the cancellation charge for uncompleted Products.

11.6 Buyer shall pay all reasonable expenses incurred by Seller in connection with a suspension, including, but not limited to, expenses for repossession, fee collection, demobilization/remobilization, and costs of storage during suspension. The schedule for Seller's obligations shall be extended for a period of time reasonably necessary to overcome the effects of any suspension.

#### **12. Compliance with Laws, Codes and Standards**

12.1 Seller shall comply with laws applicable to the manufacture of Products and its performance of Services. Buyer shall comply with laws applicable to the application, operation, use and disposal of the Products and Services.

12.2 Seller's obligations are conditioned upon Buyer's compliance with all U.S. and other applicable trade control laws and regulations. Buyer shall not trans-ship, re-export, divert or direct Products other than in and to the ultimate country of destination declared by Buyer and specified as the country of ultimate destination on Seller's invoice.

12.3 Notwithstanding any other provision, Buyer shall timely obtain, effectuate and maintain in force any required permit, license, exemption, filing, registration and other authorization, including, but not limited to, building and environmental permits, import licenses, environmental impact assessments, and foreign exchange authorizations, required for the lawful performance of Services at the Site or fulfillment of Buyer's obligations, except that Seller shall obtain any license or registration necessary for Seller to generally conduct business and visas or work permits, if any, necessary for Seller's personnel. Buyer shall provide reasonable assistance to Seller in obtaining such visas and work permits.

#### **13. Environmental, Health and Safety Matters**

13.1 Buyer shall maintain safe working conditions at the Site, including, without limitation, implementing appropriate procedures regarding Hazardous Materials, confined space entry, and energization and de-energization of power systems (electrical, mechanical and hydraulic) using safe and effective lock-out/tag-out ("LOTO") procedures including physical LOTO or a mutually agreed upon alternative method.



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13.2 Buyer shall timely advise Seller in writing of all applicable Site-specific health, safety, security and environmental requirements and procedures. Without limiting Buyer's responsibilities under Article 13, Seller has the right but not the obligation to, from time to time, review and inspect applicable health, safety, security and environmental documentation, procedures and conditions at the Site.

13.3 If, in Seller's reasonable opinion, the health, safety, or security of personnel or the Site is, or is apt to be, imperiled by security risks, terrorist acts or threats, the presence of or threat of exposure to Hazardous Materials, or unsafe working conditions, Seller may, in addition to other rights or remedies available to it, evacuate some or all of its personnel from Site, suspend performance of all or any part of the Contract, and/or remotely perform or supervise work. Any such occurrence shall be considered an excusable event. Buyer shall reasonably assist in any such evacuation.

13.4 Operation of Buyer's equipment is the responsibility of Buyer. Buyer shall not require or permit Seller's personnel to operate Buyer's equipment at Site.

13.5 Buyer will make its Site medical facilities and resources, if any, available to Seller personnel who need medical attention.

13.6. Seller has no responsibility or liability for the pre-existing condition of Buyer's equipment or the Site. Prior to Seller starting any work at Site, Buyer will provide documentation that identifies the presence and condition of any Hazardous Materials existing in or about Buyer's equipment or the Site that Seller may encounter while performing under this Contract. Buyer shall disclose to Seller industrial hygiene and environmental monitoring data regarding conditions that may affect Seller's work or personnel at the Site. Buyer shall keep Seller informed of changes in any such conditions.

13.7 Seller shall notify Buyer if Seller becomes aware of: (i) conditions at the Site differing materially from those disclosed by Buyer, or (ii) previously unknown physical conditions at Site differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract. If any such conditions cause an increase in Seller's cost of, or the time required for, performance of any part of the work under the Contract, an equitable adjustment in price and schedule shall be made.

13.8 If Seller encounters Hazardous Materials in Buyer's equipment or at the Site that require special handling or disposal, Seller is not obligated to continue work affected by the hazardous conditions. In such an event, Buyer shall eliminate the hazardous conditions in accordance with applicable laws and regulations so that Seller's work under the Contract may safely proceed, and Seller shall be entitled to an equitable adjustment of the price and schedule to compensate for any increase in Seller's cost of, or time required for, performance of any part of the work. Buyer shall properly store, transport and dispose of all Hazardous Materials introduced, produced or generated in the course of Seller's work at the Site.

13.9 [Intentionally Omitted For The Purposes Of This Contract]

### 14. Changes

14.1 Each party may at any time propose changes in the schedule or scope of Products or Services. Seller is not obligated to proceed with any change until both parties agree upon such change in writing. The written change documentation will describe the changes in scope and schedule, and the resulting changes in price and other provisions, as agreed.

14.2 The scope, Contract Price, schedule, and other provisions will be equitably adjusted to reflect additional costs or obligations incurred by Seller resulting from a change, after Seller's proposal date, in Buyer's Site-specific requirements or procedures, or in industry specifications, codes, standards, applicable laws or regulations. However, no adjustment will be made on account of a general change in Seller's manufacturing or repair facilities resulting from a change in laws or regulations applicable to such facilities. Unless otherwise agreed by the parties, pricing for additional work arising from such changes shall be at Seller's time and material rates.

14.3 It shall be acceptable and not considered a change if Seller delivers a Product that bears a different, superseding or new part or version number compared to the part or version number listed in the Contract as long as the new part is equal to or better than the old part in quality, workmanship and performance.

### 15. Limitations of Liability

15.1 The total liability of Seller for all claims of any kind arising from or related to the formation, performance or breach of this Contract, or any Products or Services, shall not exceed the Contract Price.



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15.2 Seller shall not be liable for loss of profit or revenues, loss of use of equipment or systems, interruption of business, cost of replacement power, cost of capital, downtime costs, increased operating costs, any special, consequential, incidental, indirect, or punitive damages, or claims of Buyer's customers for any of the foregoing types of damages.

15.3 [Intentionally Omitted For The Purposes Of This Contract]

15.4 Seller shall not be liable for oral advice or assistance that is not required for the work scope under this Contract.

15.5 If Buyer is supplying Products or Services to a third party, or using Products or Services at a facility owned by a third party, Buyer shall either (i) indemnify and defend Seller from and against any and all claims by, and liability to, any such third party in excess of the limitations set forth in this Article 15, or (ii) require that the third party agree, for the benefit of and enforceable by Seller, to be bound by all the limitations included in this Article 15. [Intentionally Omitted For The Purposes Of This Contract]

15.6 For purposes of this Article 15, the term "Seller" means Seller, its affiliates, subcontractors and suppliers of any tier, and their respective employees. The limitations in this Article 15 shall apply regardless of whether a claim is based in contract, warranty, indemnity, tort/extra-contractual liability (including negligence), strict liability or otherwise, and shall prevail over any conflicting terms, except to the extent that such terms further restrict Seller's liability.

#### **16. Governing Law and Dispute Resolution**

16.1 This Contract shall be governed by and construed in accordance with the laws of the State of Florida if Buyer's place of business is in the U.S. If the Contract includes the sale of Products and the Buyer is outside the Seller's country, the United Nations Convention on Contracts for the International Sale of Goods shall apply.

16.2 All disputes arising in connection with this Contract, including any question regarding its existence or validity, shall be resolved in accordance with this Article 16. If a dispute is not resolved by negotiations, either party may, by giving written notice, refer the dispute to a meeting of appropriate higher management, to be held within twenty (20) business days after the giving of notice. If the dispute is not resolved within thirty (30) business days after the giving of notice, or such later date as may be mutually agreed, either party may commence arbitration or court proceedings,

depending upon the location of the Buyer, in accordance with the following:

(a) if the Buyer's pertinent place of business is in the U.S, legal action shall be commenced in federal court with jurisdiction applicable to, or state court located in Pinellas County, FL.

16.3 Notwithstanding the foregoing, each party shall have the right at any time, at its option and where legally available, to immediately commence an action or proceeding in a court of competent jurisdiction, subject to the terms of this Contract, to seek a restraining order, injunction, or similar order to enforce the confidentiality provisions set forth in Article 6 , or to seek interim or conservatory measures. Monetary damages shall only be available in accordance with Section 16.2.

#### **17. Inspection and Factory Tests**

Seller will apply its normal quality control procedures in manufacturing Products. Seller shall attempt to accommodate requests by Buyer to witness Seller's factory tests of Products, subject to appropriate access restrictions, if such witnessing can be arranged without delaying the work.

#### **18. Software, Leased Equipment, Remote Diagnostic Services, PCB Services**

[Intentionally Omitted For The Purposes Of This Contract]

#### **19. General Clauses**

19.1 Products and Services sold by Seller are not intended for use in connection with any nuclear facility or activity, and Buyer warrants that it shall not use or permit others to use Products or Services for such purposes, without the advance written consent of Seller. If, in breach of this, any such use occurs, Seller (and its parent, affiliates, suppliers and subcontractors) disclaims all liability for any nuclear or other damage, injury or contamination. Consent of Seller to any such use, if any, will be conditioned upon additional terms and conditions that Seller determines to be acceptable for protection against nuclear liability.

19.2 , Seller may assign or novate its rights and obligations under the Contract, in whole or in part, to any of its affiliates or may assign any of its accounts receivable under this Contract to any party without Buyer's consent. Buyer agrees to execute any documents that may be necessary to complete Seller's assignment or novation. Seller may subcontract portions of the work, so long as Seller remains responsible for it. The delegation or assignment by Buyer of any or all of its rights or obligations under the Contract without Seller's prior written consent (which consent shall not be unreasonably withheld) shall be void.



## **GE Power and Water**

### **Proposal**

19.3 [Intentionally Omitted For The Purposes Of This Contract]

19.4 If any Contract provision is found to be void or unenforceable, the remainder of the Contract shall not be affected. The parties will endeavor to replace any such void or unenforceable provision with a new provision that achieves substantially the same practical and economic effect and is valid and enforceable.

19.5 The following Articles shall survive termination or cancellation of the Contract: 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16, 18, 19 and 20.

19.6 The Contract represents the entire agreement between the parties. No oral or written representation or warranty not contained in this Contract shall be binding on either party. Buyer's and Seller's rights, remedies and obligations arising

from or related to Products and Services sold under this Contract are limited to the rights, remedies and obligations stated in this Contract. No modification, amendment, rescission or waiver shall be binding on either party unless agreed in writing.

19.7 Except as provided in Article 15 (Limitations of Liability) and in Section 19.1 (no nuclear use), this Contract is only for the benefit of the parties, and no third party shall have a right to enforce any provision of this Contract, whether under the English Contracts (Rights of Third Parties) Act of 1999 or otherwise.

19.8 This Contract may be signed in multiple counterparts that together shall constitute one agreement.

#### **20. US Government Contracts**

[Intentionally Omitted For The Purposes Of This Contract].



## **GE Power and Water**

### **Proposal**

#### **STATE AND LOCAL GOVERNMENT ADDENDUM**

**[Florida]**

**THIS ADDENDUM**, entered into by and between Pinellas County, Florida, (“**Pinellas County**” or “**Customer**”) and General Electric International, Inc. (GEII) (“**GEII**” or “**Contractor**”)

#### **BACKGROUND**

- A. By the above-referenced Agreement, Contractor has agreed to provide certain Products and Services to Customer upon and subject to the terms and conditions set forth in that certain Terms and Conditions for Sale of Products and Services Form ES 104 (Rev. 4), Mutually Revised and Agreed to by GEII and Pinellas County on January 30, 2015, solely for the Supply of Products and Services as per Proposal 197866, Rev. 22 dated January 30, 2015. (the “**Agreement**”).
- B. Contractor and Customer desire to amend the terms and conditions of the Agreement, upon and subject to the terms and conditions of this Addendum.
- C. All capitalized terms not otherwise defined herein will have the meanings set forth in the Agreement.

**NOW, THEREFORE**, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties, intending to be legally bound agree as follows with respect to the Agreement and the transaction evidenced thereby:

**1. EFFECT OF ADDENDUM.** To the extent of any conflict between the terms of this Addendum and the terms of the Agreement, the terms of this Addendum will prevail and control. All terms and conditions of the Agreement not modified by this Addendum shall remain in full force and effect and are hereby ratified by the parties.

**2. NON-APPROPRIATION OF FUNDS.** Notwithstanding any provisions of the Agreement, Customer’s obligation to pay all amounts due under the Agreement in fiscal year ending on September 30, 2016 and September 30, 2017, as applicable, including but not limited to progress payments, is contingent upon the approval of appropriation of funds each of those years by its governing body. Customer intends to remit all periodic payments and other sums when due and payable to Contractor for the full term of the Agreement (the “**Term**”) if funds are legally available. In the event, despite Customer’s good faith efforts and exhaustion of all administrative appeals, (i) Customer is not granted an appropriation of funds at any time during the Term of the Agreement for the Products or Services or for other functionally similar products or services to the Equipment, and (ii) operating funds are not otherwise available to Customer to pay its obligations under the Agreement, and (iii) there is no other legal procedure or available funds by or with which payment can be made to Contractor, then Customer and Contractor shall have the mutual right to terminate the Agreement as of the last day of the fiscal period for which appropriations were received (“**Termination Date**”). At least thirty (30) days after the Termination Date (or at any time prior thereto in which the events described in (i), (ii) and (iii) have occurred), Customer’s chief executive officer (or legal counsel) shall certify in writing that (a) funds have not been appropriated for the following fiscal period, (b) such non- appropriation did not result from any failure by Customer to act in good faith, and (c) Customer has exhausted all funds legally available for the payments due under the Agreement. Such termination shall be without penalty or expense to Customer or Contractor, except that Customer shall remain obligated to pay any payments or sums due under the Agreement for which funds have been appropriated and budgeted, and on or prior to the Termination Date, Customer shall return to Contractor all Products Contractor provided to Customer prior to the Termination Date to the extent the payment for such Products remains outstanding on the Termination Date.

**3. SPECIAL REPRESENTATIONS AND WARRANTIES OF CUSTOMER.** Customer hereby represents and



## GE Power and Water Proposal

warrants to Contractor that as of the date of this Agreement, and throughout the Term thereof: (a) Customer is the entity indicated in the Agreement; (b) Customer is duly organized and existing under the Constitution and laws of the State in which it is located; (c) Customer is authorized to enter into and carry out its obligations under the Agreement, any documents relative to the acquisition of the Products and Services and any other documents required to be delivered in connection with the Agreement (collectively, the "**Documents**"); (d) the Documents have been duly authorized, executed and delivered by Customer in accordance with all applicable laws, rules, ordinances, and regulations, and person(s) signing the Documents have the authority to do so, are acting with the full authorization of Customer's governing body, and hold the offices indicated below their signatures, each of which are genuine, and the Documents constitute the valid, legal, binding agreements of Customer, enforceable in accordance with their terms, (e) the Products and Services are essential to the immediate performance of a governmental or proprietary function by Customer within the scope of its authority and shall be used only to perform such function; (f) Customer shall take all necessary action to include in its annual budget any funds required to fulfill its obligations for each fiscal year during the term of the Agreement; (g) Customer has complied fully with all applicable law governing open meetings, public bidding and appropriations required in connection with the Agreement and the Products and Services; (h) Customer's obligation to remit all amounts due and payable under the Agreement constitutes a current expense and not a debt under applicable state law, no provision of the Agreement constitutes a pledge of Customer's tax or general revenues, and any provision which is so construed by a court of competent jurisdiction is void from the inception of the Agreement; (i) all amounts due and to become due during Customer's current fiscal year are within the fiscal budget of such year, and are included within an unrestricted and unencumbered appropriation currently available for the use of the Products and Services; (j) all financial information Customer has provided to Contractor is true and accurate and provides a good representation of Customer's financial condition; (k) no event of non-appropriation, as described herein, has occurred and it is not presently known that any such event will occur under any lease or other contract by which Customer is bound; and (l) if requested by Contractor, Customer will execute and deliver to Contractor in connection with the Agreement, a certificate of resolution and incumbency and/or an opinion of counsel in form and substance satisfactory to Contractor.

**4.. EFFECTIVENESS OF ADDENDUM.** This Addendum is incorporated into and made a part of the Agreement, effective as of the same day as the Agreement. This Addendum and the Agreement together constitute the entire agreement of the parties with respect to the subject matter hereof and thereof. All terms and conditions of the Agreement not expressly modified hereby remain in full force and are hereby ratified by the parties.

**IN WITNESS WHEREOF**, the duly authorized representatives of the parties have executed this Addendum effective as of the effective date set forth above.

\_\_\_\_\_  
**Customer**

\_\_\_\_\_  
**Contractor**

BY: \_\_\_\_\_

BY: \_\_\_\_\_

NAME: \_\_\_\_\_

NAME: \_\_\_\_\_

TITLE: \_\_\_\_\_

TITLE: \_\_\_\_\_

APPROVED AS TO FORM  
OFFICE OF COUNTY ATTORNEY

By \_\_\_\_\_

Attorney



## **GE Power and Water Proposal**

### **Appendix 2**

## **Pre-Outage Station Performance Testing**

### **Performance Test**

The purpose of the pre outage performance tests will be to measure the baseline of the unit. The thermal performance test will follow the general methodology of ASME PTC-6-2004. The purpose of this test will be to define baseline of unit only and results shall not be used to validate any GE performance guarantee.

Workscope for this service is listed in the outline below.

**Table A.**

Proposal Number	197866	26009565
Model	SCSF	
Number of Units	1	
Number Days on Site	5	@ 12 hrs/day, 1 shift
Type of Performance Test	Pre Outage PTC6 Station Test	
Number Trips to Site	1	
Number of Performance Load Points	1	
Number Fuels on Guarantee	1	
Number Months Equipment Rental	N/A	

### **Performance Testing Scope**

GE will review station piping and instrumentation drawings to define instrumentation provision and cycle valve line-up list for the test.

GE will provide thermal performance personnel to provide technical direction for the conduct of the test and collection/analysis of test data.

GE Scope includes:

- Review plant provisions and station instrumentation



## **GE Power and Water**

### **Proposal**

- Execution of pre outage station test
- Summary report of results

### **Instrumentation**

The performance test measurements will be collected using permanent station instrumentation.

It is the responsibility of the buyer to supply the appropriate flow measuring sections in the balance of plant piping to meet the target level of test uncertainty.

Any additional instruments required will be pre-approved by the Buyer. The instrumentation supplied by GE will be calibrated with standards traceable to U.S. NIST or equivalent standards and will be shipped to the project site by GE. The instruments included in this quotation will be provided for the prescribed period in Table A. After the prescribed time period has expired, instrumentation rental shall be billed separately as a percentage of the value of the instrumentation, per month or any part thereof. GE will provide the technical direction for the installation and removal of GE supplied test instruments. Depending on the existing station instrumentation provisions, it may be necessary to temporarily remove station instrumentation to install test instruments. The installation of steam turbine test instruments and verification of station instrument calibration may require one twelve-hour shutdown. The removal of test instrumentation may require one four-hour shutdown (per unit), which should be scheduled for the day after the test and can occur during off-peak hours to minimize the impact on electricity generation. Any additional instruments required will be billed at Global Installation & Field Services Engineering rates:

**Shipping:** Shipping charges for additional equipment shipped to site in order to support Buyer's testing requirements will be billed at cost plus 15%.

**Calibration:** Calibration charges for additional equipment shipped to site in order to support Buyer's testing requirements will be billed at cost plus 15%.

**Rental:** The need for additional equipment not already listed above, or if the duration period the equipment is left at the site is extended due to reasons beyond GE's control, additional charges will be billed at standard rental rates.

### **Schedule**

Any work to be performed in addition to that specified in this proposal will be billed on a Time and Material basis. Such charges will be applicable to:





## **GE Power and Water**

### **Proposal**

- Training needed to gain access to the site
- Any Buyer caused delays

A. The Performance Evaluation/Testing services at the site shall commence on the date agreed upon by the parties. This proposal is based on a maximum number of trips to the site as listed in Table A.

B. The price quoted includes the performance evaluation/testing services for up to, and no more than, the total number of days at site, listed in Table A, including testing and working one 12-hour shift(s) per day for consecutive days including weekends and holidays until the testing is completed. The number of Days on Site as listed in Table A does not include travel time.

C. In the event the Buyer interrupts, extends, or accelerates the work, so as to require performance testing service at times other than provided in (B) above, the Seller reserves the right to render additional billing as follows:

- If the normal work schedule exceeds twelve hours per day, for the number of days prescribed in this proposal, the premium due the Seller will be 1.5 hours for each hour worked. In the event that the prescribed time on site is exceeded, the Buyer will be invoiced at Seller's published rates in effect at the time the work is performed.

- If the work schedule is interrupted, or extended beyond that established in the scope defined in this proposal, or if other services of the GE Performance team are required and not specifically provided for herein, such as, but not limited to, additional testing, or when the service is required during delays caused by the Buyer or others, or when the service is required during periods when work on the equipment is being performed by a labor force of less than adequate size and composition, commensurate with Paragraph C of "Buyer's Responsibilities" below, such services provided at times as provided in paragraph (B) above will be billed to the Buyer at the Seller's published rates in effect at the time the work is performed.

- If the performance test schedule is extended such that it exceeds the number of days listed in Table A for Performance Evaluation/Testing, then services in excess of stated period will be billed to the Buyer at the Seller's published rates in effect at the time the work is performed.

- If GE Performance Team is released from the site by the Buyer or demobilized from site due to site delays, while the testing is in progress but not complete, the same Performance personnel may not be available to return but will be replaced with qualified performance personnel.

D. Seller retains the option to replace the Performance Team at Seller's expense, and ensures orderly transfer of responsibilities.



## **GE Power and Water Proposal**

### **Buyers Responsibilities**

- A. Supply flow measurement sections in balance of plant piping to meet target level of test uncertainty.
- B. Make the unit available for testing and operate as required.
- C. Furnish qualified labor including necessary foremen and superintendents for installation of test instruments and pre-test checks (when necessary). The size and composition of the labor force shall be agreed upon by the parties prior to the start of testing activities and shall consist of the necessary crafts or trade to obtain optimum schedules.
- D. Notify GE of test date and required instrument on site date at least one month prior to such dates.
- E. Confirmation of test date will be communicated to GE two weeks prior to start of performance test.
- F. Provide all necessary tools, equipment facilities (including a suitable office area with electricity, trailer, shelter or section of the construction housing area where drawings, special tools, and other Seller equipment can be kept and referred to or worked upon) and devices required for the safe handling, storage and installation of the test equipment.
- G. Provide, as required, operating personnel, compressed air, fuel, electric power, lubricant oil and supplies for starting, operating, and testing the steam turbine plant.
- H. Consult the GE Performance Personnel in advance with respect to the scheduling of all on site performance testing activities and to carry out such work so as to furnish the GE Performance Team adequate opportunity to inspect the work in progress during its regular working hours.
- I. Upon receipt of test equipment provide for, unloading, transporting, storage and protection of test equipment until required for installation. At least one day prior to installation of test instrumentation transport and place instrumentation in a safe area conveniently accessible to GE TPS personnel.
- J. Buyer will take all necessary precautions, at all times, for the safety of Seller personnel at site. This includes, but is not limited to, indoctrination of Buyer's safety practices, energization/de-energization of all power systems (electrical, mechanical and hydraulic) using a lock-out tag-out procedure.
- K. Climate-controlled and secure office and storage space adjacent to the work area at the Site. Buyer will supply phone lines, T-1 Line or equivalent for High Speed Data Communication, phone and fax service as required, in the office space. Site sanitary facilities (bathroom, washroom) will be supplied by the Buyer.
- L. Removal of test instrumentation upon completion of testing