City of Pasadena
Department of Water and Power

ADDENDUM NO. 5
to

Specifications LD-13-14
for
PROVIDING LABOR AND MATERIALS FOR
GLENARM REPOWERING BALANCE OF PLANT DESIGN AND CONSTRUCTION

This addendum is issued to correct and clarify the above Specifications. All addenda will be issued electronically. This addendum shall be considered in the bid proposal and become a part of any contract made pursuant thereto:

1. Add the Q & A Table Rev 3 as part of the Specifications. The Q&A Table Rev 2 in Enclosure 1 of Addendum 4 is deemed deleted. See Enclosure 1.

2. Replace the Bidder's Proposal Form in its entirety with the revised sheets marked "Addendum 5." The only changes to the form are to clarify the meaning of D.3 and to add space for the Bidder's to acknowledge Addendums #5 and #6. See Enclosure 2.

3. Add "Bidders Clarifications and Exceptions Form" to the Bidder's Proposal Forms. For any clarification or exception to be considered, the Bidder must provide suggested wording for inclusion. Only commercial clarifications or exceptions will be considered. A Microsoft Word version of this document will be e-mailed separately to each of the Bidders. See Enclosure 3.

4. Add Appendix J "Confidentiality Agreement" to the Specification. **All Bidders must return a signed copy to Art Silva, Power Production Superintendent, Power Supply Business Unit, 85 E. State Street, Pasadena, CA 91105 prior to the close of the business on March 20, 2014.** See Enclosure 4.

5. Modify Addendum #4 Item 10 to delete the Auxiliary Cooling Water pump from the Auxiliary Load Guarantee.

"The auxiliary power load attributable to the BOP Contractor's scope of supply shall not exceed 250 kW. This value of 250 kW does not include any of the 550 kW auxiliary load attributable to the Power Island Equipment Contractor's equipment. The BOP Contractors maximum auxiliary load shall consist of the following contractor supplied items identified in of the BOP Scope of Work, Attachment A.1 Section A.5:

- *Plant Control System*
- *Power Distribution Center including HVAC*
- *Losses for the BOP supplied transformers*
- *One running Condensate Makeup Pump*
- ~~*One running Auxilliary Cooling Water Pump*~~
- *One running Bearing Cooling Water Pump*
- *One running Demin Water Forwarding Pump"*

Also see the response to Q&A #190.

6. Modify the language regarding the provision of Builder's Risk coverage contained in Item 25 of Addendum #4 as follows:

BOP Contractor shall provide at its own expense Builder's All Risk Insurance through the end of the Warranty Period. The insurance shall insure the BOP Contractor, PIE Contractor, and the City against all risks of damage to new buildings, structures, equipment, and materials that are part of the Work~~, as well as damage to the Broadway and Glenarm power plant attributed to performance of the Work~~. The Builder's All Risk policy shall insure against all risks, including without limitation risks of:

a) any direct physical loss or damage to the Work~~, the Broadway and Glenarm power plant, or any portion thereof~~ from any cause, including without limitation flood, earthquake or tidal wave;

b) any mechanical or electrical breakdown that occurs during any performance testing or other testing or operation of any component associated with the Work;

Also see the response to Q&A #177.

7. Delete Part 3 Section C of Specification 480020 in Attachment A.2.B Construction Specifications. Add to Part 3 Section G of Specification 480020 in Attachment A.2.B Construction Specifications a new item 3, Glenarm Revised Seismic Calculations, to be used in place of Part 3 Section C. See Enclosure 5.

8. Add Specification 485325.11 Ammonia Forwarding Pumps Rev A to Attachment A.2.A BOP Supplied Equipment Specifications. See Enclosure 6.

9. Add Specification 485951 80 Steam and Water Sample Panel Rev A to Attachment A.2.A BOP Supplied Equipment Specifications. See Enclosure 7.

10. Add IST Jumper Tube Installation proposal to Attachment A.3.A City-Supplied Power Island Equipment Information. See Enclosure 8.

11. The BOP Scope of Work Attachment A.2 Document List Revision 5 remains as the current revision. See Enclosure 9.

12. The BOP Scope of Work Attachment A.3 Reference Document List Revision 5 remains as the current revision. See Enclosure 10.

13. The design review meeting with General Electric and IST regarding the OTSG that had been planned for the week of May 21 has been changed. There will be a design review with the City and its Owner's Engineer on April 1 and 2, 2014 in Alpharetta, GA. There will be a follow-up design review with the selected BOP Contractor after the Full Notice to Proceed.

Dan Angeles

Date: 3/14/13

Dan Angeles
Principal Engineer
City of Pasadena Water and Power Department

Enclosures:

RECEIPT OF ADDENDUM NO. 5

Specifications LD-13-14

for
PROVIDING LABOR AND MATERIALS FOR
GLENARM REPOWERING BALANCE OF PLANT DESIGN AND CONSTRUCTION
FOR
PASADENA WATER & POWER
PASADENA, CALIFORNIA

This Receipt must be signed and returned with your bid. Failure to include signed acknowledgements of all addenda will cause the bid to be deemed incomplete and nonresponsive.

I hereby acknowledge receipt of Addendum No. 5 for Specifications LD-13-14 for Providing Labor and Materials for Glenarm Repowering Balance of Plant Design and Construction.

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_____
Date

_____
Company Name

_____
Authorized Signature

Enclosure 1

City of Pasadena - Glenarm GT5
Pre-Bid Meeting Questions
Revision 3

Last Updated March 14, 2014

Question #	Question	Answer	Status	Responsible Party
1	Drawing E6-10 shows a vault identified under note 4 and located at the east end of the Glenarm building. The scope document indicates that this vault is for the 17.2 kV feed form the dispatch center. Given it's location it would appear that it is intended to be inserted in the existing 17.2kV trench on the east of the building as shown on sketch 6-1. Please clarify the intended use and location of this vault.	Location to be determined by the BOP with the intention of feeding through this vault for 17.2Kv feed to the PDC.	CLOSED	
2	The fire marshal (FM) has dictated that the auxiliary lube oil skids/containers be misted/sprinkled. We heard this at the bid meeting on 1/8/14. What does PW&P expect for containment of the oil & water. Depending on the spray volume, this could be a significant quantity and flow of oil & water.	For indoors, the containment would be expected to hold the contents of the largest single container of material, plus 20 minutes of fire flow. For outdoors, the containment would be expected to contain the same, plus the volume of 24 hours of rainfall from a 25 year storm unless it's protected from rainfall. Drainage from the containment area should be sized for the amount of fire flow and rainfall, as applicable.	CLOSED	
3	The scope requires a soil resistivity test after soil removal & recompaction. Presumably this is for grounding design. Is the engineer required to wait to complete a grounding design until after this is complete?	Resistivity values provided can be used to initiate design. Post-backfilling tests should be performed to confirm values.	CLOSED	
4	The containment area fill for future lay down appears to be at a different elevation than the surrounding roads/asphalt. Please confirm elevations to determine if we need to dedicate space in the area for ramping.	The lay down area is approximately 12" higher than the surrounding asphalt. The BOP Contractor will need to plan how to deal with the change in elevation.	CLOSED	
5	Confirm whether a licensed structural engineer is required for the project. i.e. is a licensed civil engineer is acceptable for design of structures for this project.	It is acceptable for the BOP Contractor to utilize a licensed California civil engineer for the design of the structural design.	CLOSED	
6	Clarify how ADA requirements apply for the site. i.e. what buildings are required to be ADA?	ADA requirements apply to the control building.	CLOSED	
7	Does the new fence/wall along Fair Oaks need to be built first, or can it be built near the end of the project?	The decision lies with the BOP contractor.	CLOSED	
8	Clarify if a firewall or blast wall is required between gas compressors and control building.	It is a protection wall and yes it is required.	CLOSED	
9	Section 262600 (Power Distribution Center) Section 2.9-B-1 requires a 5' clearance under the PDC and Section 5.5 states 8' clearance; please clarify	Actual clearance is to be 6' to bottom of steel.	CLOSED	
10	Specification LD-13-14, 7.2 states water use cost by contractor and scope of work page 140 states water use cost by City of Pasadena; please clarify.	Point of water connection provided by city; cost of water usage by BOP	CLOSED	

Question #	Question	Answer	Status	Responsible Party
11	Is any epoxy grout required for the GE supplied equipment?	Assume none for bid purposes. Grout specifications (in accordance with project design specifications) grout shall be non-shrinkable, at all ages, when tested in accordance with American Society for Testing and Materials (ASTM) C-827. Effective bearing area shall not be less than 95% in hardened state when tested in accordance with ASTM C-827. If using an epoxy grout for use around turbine and generator skid and anchor bolt, grout must meet requirements of Corps of Engineers CRD C-621 and ASTM C-1107. Peak exotherm of a cylinder of grout material 2 inches in diameter and 4 inches high shall not exceed 95 °F (35 °C), when tested at material and laboratory temperatures of 75 °F (24 °C). Working life of grout shall be 60 minutes minimum at 75 °F (24 °C).	CLOSED	
12	Can testing water be supplied?	Yes at metered cost to the BOP Contractor	CLOSED	
13	Can 70F testing water be supplied for Section 1 hydros?	Assume a package boiler may be required.	CLOSED	
14	Is the onsite resident engineer requirement of scope of work Section C.4.1.2 for a full time requirement?	It is the responsibility of the BOP Contractor to provide engineers as needed.	CLOSED	
15	Attachment 4 of GE document (schedule major component, RTS and delivery dates) based on GE provided NTP of September 27, 2013. Was NTP provided on September 27, 2013?	NTP was provided on September 27. However since that time the delivery dates have been re-negotiated to obtain a better delivery sequence to support expected construction needs as well provide more time for preparation of the site and foundations. These are the current Ready to Ship (RTS) and Guaranteed Delivery (GD) dates as contained in the draft of GE's Change Order #1: Inlet Chiller - RTS 12/17/14 GD 1/28/15 Gas Turbine - RTS 1/23/15 GD 3/2/15 CEMS - RTS 1/30/15 GD 3/13/15 Fuel Gas Compressor -RTS 2/9/15 GD 3/23/15 OTSG - RTS 2/20/15 GD 3/30/15 GSU Transformer - RTS 2/13/15 GD 4/3/15 Steam Turbine - RTS 2/27/15 GD 4/6/15 Auxiliary Boiler - RTS 2/25/15 GD 4/8/15 Auxiliary Boiler Superheater - RTS 2/27/15 GD 4/10/15 Condensate Polisher - RTS 2/27/15 GD 4/10/15 Circulating Water, Condensate, and Feedwater Pumps - RTS 3/4/15 GD 4/15/15 STG Bypass Valve - RTS 3/4/15 GD 4/15/15 Cooling Tower - RTS 3/6/15 GD 4/17/15 Condenser - RTS 3/9/15 GD 4/20/15 Compressed Air Skid - RTS 3/27/15 GD 5/8/15	CLOSED	
16	Section 485312 (circulating water pumps) section 1.2-A-2 states one speed drive motors and Section 1.7-A-8 states two speed motors; please clarify.	The circulating water pump motors are single speed	CLOSED	
17	Section 480031-2 (noise control performance) section 2.2 refers to attachment 6 - performance guarantees and part 3 refers to contract liquidated damages. Can not located liquidated damages in contract.	The BOP contractor does not need the GE Liquidated Damages as they do not apply to the BOP	CLOSED	

City of Pasadena - Glenarm GT5
Pre-Bid Meeting Questions
Revision 3

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18	When will design information be received for the PIE equipment?	These are the current initial drawing delivery dates for major groups of drawings. A more detailed listing can be made available if needed. Following the initial release by General Electric, there is a 3 week period for the City to review and comment on the drawings. General Electric will then issue final drawings seven to eight weeks thereafter depending on the drawing set. These dates do not include erection manuals, procedures, O&M manuals, etc. ; just the design drawings. Gas Turbine Foundation Drawings - 2/7/14 Gas Turbine Electrical and Balance of Drawings - 3/7/14 OTSG Foundation Drawings - 3/21/14 OTSG Balance of Drawings - 5/9/14 STG Foundation Drawings - 5/2/14 STG Electrical Drawings - 7/25/14 STG Enclosure Drawings - 6/6/14 STG Balance of Drawings - 10/17/14 Condenser Drawings - 5/9/14 Cooling Tower EXCEPT Electrical Drawings - 6/27/14 Cooling Tower Electrical Drawings - 7/25/14 Pump EXCEPT Electrical Drawings - 7/25/14 Pump Electrical Drawings - 8/8/14 Fuel Gas Compressor Foundation Drawings - 4/4/14 Fuel Gas Compressor Balance of Drawings - 5/16/14 Chiller EXCEPT Electrical Drawings - 4/4/14 Chiller Electrical Drawings - 5/2/14 Condensate Polisher Drawings - 6/6/14 GSU Transformer Drawings - 7/25/14	CLOSED	
19	Are there permit requirements tied to construction of the wall along Fair Oaks?	There are permit requirements tied to the construction of the wall, the Planning Department for Design Review and Building Department for structural review.	CLOSED	
20	IST is a mandatory subcontractor that is not local. The welding could be self-performed. How will the IST subcontract be considered towards the local content criteria?	The orbital welding on the IST equipment is proprietary in both equipment and procedure and the BOP Contractor must subcontract with IST. As IST is not local to Pasadena, this subcontract does not count towards the 15% goal.	CLOSED	
21	In the RFP documents, there are two references mentioned for seismic design criteria. One is based on 2013 CA Building Code (CBC), the other is based on ASCE 7-05 which is 2010 CBC. Which version of CBC is to be used for project design?	This is an update of our prior response due to further information becoming available. Also see the response to question #21. The BOP Contractor is required to work to CBC-2013. In addition the Building Department has required that site specific seismic data is required. For bidding purposes the bidder should proceed on the basis of using the information in the Specification. The PIE Contractor and their suppliers are working to CBC-2010. The City is in discussion with the PIE Contractor to address provision of foundation loads calculated in accordance with CBC-2013 for use by the BOP Contractor.	CLOSED	
22	Have you had conversations with the building trades on how they could support the 25% local hire requirements considering their collective bargaining provisions?	Yes and the building trades feel confident that the 25% requirement can be achieved.	CLOSED	

Question #	Question	Answer	Status	Responsible Party
23	GE BOP equipment lists 'preferred suppliers' as opposed to chosen suppliers. Are these suppliers fixed or subject to change?	General Electric is finalizing its suppliers. The current list is as follows; Fuel Gas Compressor - Kobelco Chiller - Stellar Gas Turbine - General Electric Heat Recovery Steam Generator - OTSG by IST CEMS - CEMTEK Steam Turbine - Shin Nippon GSU Transformer - GE Prolec Additional information will be provided as it become available.	OPEN	Diane Donovan
24	Will a water analysis data sheet be provided for the BOP to design and procure the chemical feed system?	Yes. Refer to condensate polisher spec. A3	CLOSED	
25	Are start up and commissioning chemicals to be provided by BOP as well as initial 'fills'	Yes. See Section 480032.1 Item 1.3.A.8 in Attachment A.1 of the Specifications.	CLOSED	
26	Does the BOP contractor work with GE and/or ATCO (the steam turbine enclosure provider) directly during proposal development for load requirement of piping and cable trays?	The steam turbine enclosure will only be used to support the fire sprinkler piping.	CLOSED	
27	For what equipment will GE supply 3D models? GTG? STG? OTSG?	3D models will not be available during the bidding period. A 3D model of the LM6000 will not be available. A 3D model of IST's Once Through Steam Generator will be available. A 3D model for the STG will be available. The 3D model will be a surface type model showing terminal point connections. A few clarifications: 1) the 3D model is not a contract deliverable and is provided as a matter of convenience for the BOP engineer, 2) the 2D drawings take precedence over the 3D model - the BOP engineer will need to check for dimensional differences between 2D drawings and the 3D model. 3) The 2D drawings (contract deliverables) will accurately reflect changes in equipment that might not be updated in the model. 4) The 3D model will be issued after the 2D drawings are issued and after Shin Nippon receives 3D models from their sub-suppliers. GE does not have contract dates with Shin Nippon for a 3D model and will provide it after these activities are complete. GE will provide other 3D models of their power island equipment if and as they become available.	CLOSED	
28	The BOP contractor is required to contract with the cooling tower manufacturer for field erection; provide cooling tower vendor information.	GE expects to finalize their cooling tower selection by the end of March. This response will be updated once the selection is made.	OPEN	Diane Donovan
29	Please confirm material requirement for feed water & condensate piping, or if carbon steel A106 is suitable	Please refer to P&IDs. Given the need for high purity water for the OTSG, all condensate & BFW piping is stainless steel.	CLOSED	
30	Is hazard assessment surrey reports on all asbestos containing areas available?	Yes, and will be provided in Addendum 3	CLOSED	
31	Is a list of hazardous waste sites available?	No, the Bidder will have to propose and include in the haz waste plan submittal	CLOSED	

City of Pasadena - Glenarm GT5
Pre-Bid Meeting Questions
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Question #	Question	Answer	Status	Responsible Party
32	What permits and inspections are required for historical structures?	Building Permit for the sealing of tunnel openings of the Glenarm Building.	CLOSED	
33	Should fire protection system for control be water mist or FM200?	The control room will have water mist pre-action system.	CLOSED	
34	Please specifically state that the STG fire protection by the BOP Contractor shall be pre-action fire water and deluge if required for STG bearings and lube/hydraulic oil systems. No clean agent gasses are planned.	The STG fire protection requirements are defined in the Specification. No clean agent is required. STG roof preaction, STG bearings preaction with rate of rise detections, and STG lube oil deluge are all required.	CLOSED	
35	Please confirm aircraft warning lights are supplied if required by local codes for the exhaust stack.	No aircraft warning lights are required	CLOSED	
36	Please confirm all IST pressure/temperature instruments are provided and rack mounted and that the BOP Contractor is responsible only for junction boxes, tubing, and wiring.	Refer to M195 in A.3 owner supplied equipment. Items shown with an asterisk are supplied by IST. TEs will be supplied by IST. All other instruments by BOP.	CLOSED	
37	In the RFP documents seismic design values based on CBC 2010 have been provided. During pre-bid meeting, it has been cleared that 2013 version of CBC will be used. Can you provide us with the new seismic design values based on CBC, 2013 version	Since providing our initial response additional information has become available. Also see the response to question #21. The seismic design methodology did not change from 2010 to 2013, however the response spectra from the USGS hazard maps has increased. The City Building Department is also requiring a site specific seismic evaluation due to the proximity of the Raymond Hill fault which runs east-west south of the site. The results of that study are expected in ~2 weeks time and will be provided in Addendum #5. However it is up to the Bidder to select the proper values as they will be the responsible engineer for the project. The values provided in the Specification are to be used as general guidance only.	CLOSED	

Question #	Question	Answer	Status	Responsible Party
38	Clarify/confirm/identify what drawings/calculations are required to be submitted to city for review	The project will be reviewed under one building permit. The Building Department will be happy to sit down with the BOP Contractor to discuss plan requirements and submission after award. To operate under one permit, the BOP Contractor will need to submit a Foundation Key Plan for all of the equipment foundation drawings. This will serve as a placeholder for the permit. Once the first equipment foundation is finalized, it will be submitted as a revision to the original permit and the Building Department will then review it. The same process will take place for the succeeding foundation drawings as they are ready for submission. The Building Department will perform the review internally (they do not plan to hire an outside consultant). At a minimum the following will be reviewed: * Soil design, rebar, concrete, bolting, seismic design * Grading and drainage plans * All foundation designs and calculations will be reviewed * All systems containing hazardous materials will be reviewed * The fire protection systems will be reviewed (detection and suppression) * Access for fire and emergency vehicles * The Control Room building will be subject to a complete review * The pre-cast wall along Fair Oaks * The Glenarm Building tunnel seals An NPDES SWPPP for construction is required to be complied with by the BOP Contractor.	CLOSED	
39	Hyrdologue Inc. representative stated during the pre-bid meeting that additional soil samples have been taken for soil contamination determination. Hyrdologue also stated that no critical contamination levels are anticipated for the project site. Will it be possible for us to get the new soil contamination results as they are available?	Initial test results show that the Dioxin levels on-site at 6" and 12" below grade are below the off-site background levels. DTSC's initial review was to accept the City's recommendation that no further action was needed.	CLOSED	
40	Please define all GE loads & utilities after an emergency shutdown as well as duration, voltage phase, etc. Relevant to safe & proper shutdown of GT & STG & other BOP equipment within GE/IST scope of supply.	Refer to Addendum #4 for information on the LM6000 that GE has provided. They do not expect to have information for the other equipment within their scope of supply until the end of March.	OPEN	Diane Donovan
41	Please define length and diameter of P91/P11/P21 alloy piping materials for interconnecting piping to silencer and/or any other known equipment interconnects to IST/GE equipment	Based on preliminary sizing information, IST expects the interconnecting piping between the start-up vent to the silencer to be 6 NPS Sch 80 SA335 P22. The silencer will have a flanged connection while the control valve and start-up vent isolation valve have butt weld ends. The length of piping between the start-up vent and silencer will depend on the location of the take-off relative to the silencer position. Line diameter sizing information will be confirmed upon completion of valve sizing around March 14th. For the steam piping, IST expects this to be a 10 NPS Sch80 SA335 P22 pipe. The IST supplied portion of the pipe spool will be approximately 15 ft in length. This will be confirmed by the next release of the General Arrangement drawing.	CLOSED	

City of Pasadena - Glenarm GT5
Pre-Bid Meeting Questions
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Question #	Question	Answer	Status	Responsible Party
42	Please confirm if SS liner is required by GE/IS for any de-superheater or bypass piping interconnections or if P91/P11/P21 is required.	1. SS liner is required immediately downstream of the de-super heater. This is a GE standard. 2. SS liner is not required on bypass piping connections. 3. Based on maximum temperature of the steam (914oF), it is expected that P11 piping will be required for the HP steam and bypass piping. BOP contractor will be responsible for final confirmation and selection of piping materials based on the GE data blocks which are scheduled to be issued no later than April 4, 2014.	CLOSED	
43	Equipment doors on west side open into firewall behind GSU XFMR. What is concept for truck access for equipment removal?	The platforms provided by BOP will need to allow for equipment removal	CLOSED	
44	Are the GE provided panels that are shown on E1-2 shown correctly? TCP Mark VIE panels for CTG and STG often are 6-10 units. Including GPP for 2 units, exciter/AVR for STG, etc., is the allocated space sufficient?	We believe we there is adequate room in the PDC for the referenced panels.	CLOSED	
45	Is battery room required for QEL-CEL battery stacks? If required, is space shown sufficient for 125v battery and 24v battery?	Battery room is basis of bid and is required.	CLOSED	
46	In regards to local business participation obtaining 15% local procurement and subcontracting; do team members count as self-perform?	People performing work that are employees of the BOP Contractor count for self-performed work. Work performed by the any of the BOP Contractor's sub-contractors does not count as self-performed.	CLOSED	
47	In regards to local business participation obtaining 15% local procurement and subcontracting; how do you satisfy 15% requirement at bid time if 7% is material procurement from local Pasadena business?	In order to give the prime credit for the purchases, prior to them actually making the purchases, the Prime has to list the local supplier as a subcontractor.	CLOSED	
48	Will the prime receive credit towards the 15% local business, for transactions generated by our subcontractor?	Yes, the goal is that 15% of the BOP Contractor's subcontracted work be spent with local Pasadena businesses.	CLOSED	
49	Local participation of 15% is required. It is understood this requirement pertains to subcontractor and procuring content combined. In other words if our price for subcontracted work is $10,000,000 and our price for procurement is $10,000,000 the aggregate is $20,000,000 therefore we would need to spend 15% of $20,000,000 ($3,000,000) on local Pasadena subcontractors and/or vendors. Please confirm this is correct	That is correct.	CLOSED	

Question #	Question	Answer	Status	Responsible Party
50	When calculating total subcontractor and procurement dollars are we to include other costs such as sales tax, bonds, markup in the calculation? Example: If procuring dollars are $10,000,000 exclusive of sales taxes and say sales taxes are 9% total procurement cost would be $10,900,000. If subcontractor content is $10,000,000 exclusive of bonds and bond cost are an additional 1% sub-value would then be $10,100,000. In summary, do we shoot for 15% of $20,000,000 or do we shoot for 15% of $10,900,000 plus $10,100,000 which totals $21,000,000?	The City considers the value of the contract.	CLOSED	
51	Does procuring for project apply only to permanent plant materials or could it include items such as small tools and consumables as well?	Small tools, equipment, and consumables count towards the 15%.	CLOSED	
52	Clarify the 15% local requirement. I.E. 15% applies to total subcontracted plus total procurement. Confirm if this includes taxes/fees, etc.	See responses to items 49 and 50.	CLOSED	
53	What is the evaluation criteria for the local preference point system? I.E., advertising is worth 5 points. What determines if the bidder receives full points at 5/5 versus partial points?	As you cannot partially advertise or solicit bids, there are no partial points.	CLOSED	
54	GE is supplying the STG enclosure (building). Is GE responsible for building official/building permit requirements? If BOP contractor is responsible, who is responsible if the building official requires changes/additions?	General Electric is responsible for providing the design of the steam turbine enclosure. The BOP Contractor is responsible for working with the City's Building Department. If changes to GE supplied equipment are needed, those will be worked through the City's GT5 Project Team.	CLOSED	
55	On page 12 of scope of work, it is stated that "SWPPP and SUSMP permits will need to be obtained by the BOP contractor". On page 49 of the same document, under section G.11 it is mentioned "… development of SWPPP meeting all state and EPA regulators and supporting PWP in updating their SUSMP permit." Please clarify the scope of this SUSMP (standard urban storm water mitigation plan) on the BOP contractor side.	The BOP Contractor shall only prepare SWPPP. A SUSMP is not required.	CLOSED	

Question #	Question	Answer	Status	Responsible Party
56	What are the options of locations for hazardous material disposal?	The BOP Contractor will have to retain and pay for the services of an environmental consultant to prepare , submit, and obtain fire department approval of hazardous waste work plan as well as manage the remediation, waste characterization, waste profiling, transportation, & disposal of hazardous waste in accordance with local, state, and federal environmental regulation. Depending on how it's sub-contracted out, this could be one work plan for everything or several separate ones. The BOP Contractor shall submit work plans for the following: - Lead/asbestos abatement on structures - Electrical transformer removal (assuming they are not just being sent as hazardous waste) - Cleaning and removal of fuel oil piping (assuming they are not just being sent as hazardous waste) - Soil remediation The work plans will need to demonstrate that the proposed contractor is suitably qualified and licensed for the work, document the procedures used to remove and manage the hazardous materials from generation through disposal, and propose cleanup levels and sampling criteria based upon current regulatory standards. Pasadena Fire Department review of submittals and reports, as well as required inspections, The current billing rate for reviews is $202/hr for the time required. Lead and asbestos work are also likely regulated by CalOSHA and/or AQMD and may require additional submittals and/or permits for those agencies.	CLOSED	
57	What are the technical specs for flowable fill; if used?	This is the responsibility of the BOP Contractor since they are performing the construction. Flowable fill mixtures are usually specified to meet either a compressive strength or unit weight requirement. The compressive strength is typically measured by testing a 4 x 8 inch cylindrical test specimen in compression. The National Ready Mixed Concrete Association defines an "excavatable" flowable fill mixture as one with a compressive strength not exceeding 150 pounds per square inch. We do not have a formal technical spec for flowable fill. Standard criteria are: * Unit weight: 20#/CF to 145#/CF * Compressive Strength: 150psi max (any more than this will not allow for future ease of excavation) A typical mix uses approx. 100# cement, 250-300# fly ash, and the rest clean sand, water and selected admixtures…on a per cubic yard basis.	CLOSED	
58	On page 34 of scope of work there is a statement, "organics removed from the site will most likely be reduced this soil, if cleared organic material, can be used for fill on site per the geotech report." For proposal preparation, should we assume 1.3000cy is accurate and price accordingly?	You should base your bid upon the quantities provided.	CLOSED	
59	What are the safety training requirements for workers at the site? (how many hours?)	No specific requirements but it will be discussed on the pre-construction meeting. BOP Contractor is responsible for the haz mat training required under local, state, & federal environmental regulations.	CLOSED	
60	Are drawings of maintenance shop available?	The Maintenance Building has been removed from the scope of the project.	CLOSED	

City of Pasadena - Glenarm GT5
Pre-Bid Meeting Questions
Revision 3

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61	Are extended hours allowed for monolithic pours on the center-line foundation?	You should assume that the monolithic pours must be completed within the standard allowed work hours.	CLOSED	
62	Are there any extended time curing requirements?	Per ACI mass concrete requirements	CLOSED	
63	Will plant operations be allowed on Sunday?	Operations: yes Construction: no	CLOSED	
64	Will any historic building inspections be required?	Building Department on sealing of tunnel openings.	CLOSED	
65	Will we utilize the plant's EPA processes for hazardous material?	Yes	CLOSED	
66	Will there be any CBO involvement?	There will not be a CBO in the sense of a California Energy Commission jurisdictional project. However the Pasadena Building Department does expect to review the project design as well as field inspections.	CLOSED	
67	Does the 15% requirement apply to the aggregate of subcontracting and procurement?	See responses to items 49 and 50.	CLOSED	
68	If we use a company that the city of Pasadena uses, but is not located within the city of Pasadena, does it count towards the 15%?	No	CLOSED	
69	Is the list of Pasadena firms classified by business type?	No, business type is not the criteria, location within the City of Pasadena is the critical criterion.	CLOSED	
70	Are there extraction points for the gear box?	There is a removable panel on the GTG per the GE presentation. The STG gear box should be accessible through the roof.	CLOSED	
71	Is the generator rotor located out of the back?	The generator rotor for both the STG and the GTG will be to the west. Removable panels will be provided by GE for both.	CLOSED	
72	Does the steam turbine include a removable roof?	Sections of the roof are removable.	CLOSED	
73	Will GE define the requirements for the chemical feed systems?	They are included in the issued specifications	CLOSED	
74	Will GE be treating the boiler feed pumps for acoustics?	Yes, If necessary to meet their noise guarantee.	CLOSED	
75	Will the slides from GE's presentation be included in the addendum?	They are being distributed as part of Addendum #2.	CLOSED	
76	Is GE's equipment data current?	Yes	CLOSED	
77	Are the GE preferred vendors confirmed or yet to be determined?	See response to item 23.	CLOSED	
78	When will the bidders know GE's final equipment selections?	See response to item 23.	CLOSED	
79	It was noted that the steam turbine included shims, but are they also included with the gas turbine?	Shear lugs only for gas turbine	CLOSED	
80	Are the generator protective panels included with all devices?	Yes; the BOP is to have them installed in the PDC furnished by the BOP Contractor.	CLOSED	
81	Are the power requirements after shutdown defined?	See response to Item 40.	CLOSED	
82	Is the steam turbine grout or epoxy?	See response to Item 11.	CLOSED	
83	Are the erection plates designed for seismic activity?	Yes	CLOSED	
84	Will the erection plates be bolted and welded?	Yes	CLOSED	
85	Do the modules come prime or painted?	They will be delivered in a primed condition. It is the BOP contractor's responsibility to do touch ups	CLOSED	
86	Is there a recommended traffic-rated cover to protect pipes onsite?	It is the BOP Contractor's responsibility to provide adequate protection.	CLOSED	

City of Pasadena - Glenarm GT5
Pre-Bid Meeting Questions
Revision 3

Question #	Question	Answer	Status	Responsible Party
87	Are the soil resistivity levels defined?	See response to Item 3.	CLOSED	
88	Are there any requirements for soil remediation in the lay-down yard following use?	The BOP Contractor must restore the laydown area to its as found condition	CLOSED	
89	Are there any architectural details for the 10' protection wall?	There are no architectural requirements.	CLOSED	
90	Is the PDC considered a habitable structure with ADA requirements?	No, there are no ADA requirements for the PDC.	CLOSED	
91	Can additional site visits be requested?	Yes, if scheduled in advance with at least one week's notice.	CLOSED	
92	Which version of the building code will be used on the project?	See response to Item 21.	CLOSED	
93	Are there any requirements to have external condensate storage during drain down of IST's equipment?	The plant design includes a 5,000 gal. Condensate Storage Tank	CLOSED	
94	Are gas blows allowed on the project?	No, natural gas blows are not allowed.	CLOSED	
95	Will the erection procedures for the LM6000 and OTSG be included in the bid package?	Yes, to the extent shown at the pre-bid meeting.	CLOSED	
96	Will the sign-in sheet be made available?	They are being distributed as part of Addendum #2.	CLOSED	
97	Does the CEMS package include the umbilical?	Yes	CLOSED	
98	Will the project primarily be using Donaldson filter houses?	Yes	CLOSED	
99	Does the existing 6’ x 4’ storm drain culvert lie within an easement? If so, please provide the recorded easement document with legal description and any encroachment restrictions.	No	CLOSED	
100	Since the boilers and burners in the Glenarm Building are not being removed and there is no “seismic retrofitting” of the Glenarm Building, are “demolition” & “protection” plans and a “Historic American Building Survey (HABS) Level III recordation” required prior to any demolition within the Glenarm Building (see Mitigation Monitoring and Reporting Program (MMRP) Mitigation Measures CULT-1, -2 & -3), or for any other existing structure? And is an “interpretive architectural exhibit” required per MMRP Mitigation Measure CULT-2?	There is no demolition within the confines of the Glenarm Building. Therefore a plan is not required.	CLOSED	

Question #	Question	Answer	Status	Responsible Party
101	Has PWP submitted "comprehensive pre-demolition asbestos" and "lead-based paint" surveys "for all existing buildings located on the project site" and a "soils management plan" for "excavation and grading activities on the project site" to the City of Pasadena Fire Department per MMRP Mitigation Measures HAZ-1, -2 & -5? If so, please provide the surveys and plan. If not, please let us know when they will be submitted and their expected approval.	The GT5 Repower EIR Mitigation Measure indicated that an asbestos/lead survey and soil management plan shall be submitted to Pasadena Fire prior to demo. The Mitigation Measure and reporting Program (MMRP) from the EIR is in the BOP Contractor Specification. As the City will not be occupying the Glenarm Building as part of this project, the asbestos and lead abatement will be limited to the structures that will be removed on the south side of the building (i.e., smoke stack, air compressor building, restroom, and piping in the tunnels outside the building that will be removed). There will be organic & lead contaminated dirt remediation. There are electrical transformers that contain < 2 ppm PCB based on PWP's latest sampling and analysis and there are old fuel oil lines in the tunnels that will be removed. The BOP Contractor could handle this as one work plan for everything or several separate ones. They'll need work plans for the following: - Lead/asbestos abatement on structures - Electrical transformer removal (assuming they are not just being sent as hazardous waste) - Cleaning and removal of fuel oil piping (assuming they are not just being sent as hazardous waste) - Soil remediation The work plans will need to demonstrate that the proposed contractor(s) is suitably qualified and licensed for the work, document the procedures used to remove and manage the hazardous materials from generation through disposal, and propose cleanup levels and sampling criteria based upon current regulatory standards. Pasadena Fire will charge $202/hour for review of submittals and reports, as well as required inspections. This rate is subject to escalation each fiscal year. Lead and asbestos work may also require additional submittals and/or permits from CalOSHA and/or AQMD.	CLOSED	
102	Can we design flexible & rigid pavement sections per the Soils Engineering Investigation's R-value tests of "60 and 67" (page 22) instead of per the paving thickness designs "outlined in section 9.0 Paving of the Soils Investigation Report" based on "an assumed R value of 35" (section 9.2, page 43)	The BOP Contractor will be responsible for the pavement design and layer thickness for surface and base courses. The BOP Contractor may use either CALTRANS or AASHTO methods of flexible and rigid pavement design and will need to select the input values for either method based on information provided in the geotechnical investigation and the Contractors design experience and expertise. The road layer thickness provided in Section 9.2 are based on an R value of 35 as noted and provides expected layer thickness based on that value. The actual R values from lab results for two boreholes are 60 and 67, respectively as noted. The BOP Contractor may use these or other R values based on experience.	CLOSED	
103	Is the reinforced concrete paving covering the "operating areas" to be designed for "heavy truck drives" (2nd to last paragraph in SOW, page 46)?	The intent is to have all concrete H-20 rated, with thickened areas for crane loading on the west side of the GTG and then also south of the cooling tower.	CLOSED	
104	Please clarify the conflicting statements in the 3rd paragraph of SOW, page 49, regarding spill containment areas: "The containments shall be provided with sumps to pump out rain water or contaminated water." and "All spill containment areas shall be set to gravity drain to grade . . ."	Sump pumps are needed to pump out rain water or contaminated water if the containment is located below grade and will not have the proper slope towards the oily water separator.	CLOSED	

City of Pasadena - Glenarm GT5
Pre-Bid Meeting Questions
Revision 3

Question #	Question	Answer	Status	Responsible Party
105	Is the existing on-site AC roadway running N. – S. between East State St. and the new plant proper to be removed and replaced, or can it be left in place to connect with the proposed new roadways on its west and north ends?	The existing AC paving can be left in place. However, the BOP Contractor is responsible to bring it back to its pre-construction condition before final acceptance of the City of the project.	CLOSED	
106	What volume of "residual fuel oil" in the "asbestos insulated fuel oil piping" and "asbestos containing materials (ACM)" needs to be removed, remediated, and properly disposed (SOW sections A.7.1.i., page 6, and G.2, page 39)?	BOP Contractor shall include in his bid the price for the removal of oil in the fuel oil piping and assume that pipe is full of fuel oil and shall include in his bid the price for removal of all insulation based on the assumption that the insulation is ACM. BOP Contractor is responsible for determining the quantity of the material to be removed.	CLOSED	
107	Per SOW, paragraph 2, pages 5 & 6, of Addendum No. 1, can Hyrdologue serve as both the "geotechnical firm . . . present for all excavation and backfill activities on site" and the "third party geotechnical firm . . . required to be on site for all inspections, testing and reporting including compaction, soil testing, etc.?	Yes, the City does not have any restrictions insofar as the Bidder using Hydrologue as a 3rd party geotechnical firm. It is solely the Bidder's determination as to what firm to use for this role.	CLOSED	
108	Please confirm that the contractor-provided "unit rates" for the "Quantities of soil to be excavated and recompacted, organic materials and lead contaminated soils to be removed from the site and concrete volumes to be demolished" will be used as both an extra to "account for additional material to be handled/removed" and as a "credit for materials not handled and removed" (SOW, section G.1, 3rd paragraph).	Yes, the unit rates that were requested are to be used to adjust up or down the BOP Contractor's cost based on actual volumes.	CLOSED	
109	Where is the Ground Penetrating Radar report in the RFP bid documents? If missing, please provide.	The GPR report is in the document 3626-03 Geophysical Investigation found in A.3.C/Reference & Preliminary Design Scoping/ Geotech Report and GPR / Geotech	CLOSED	
110	Does the 10 minute start requirement apply to the BOP Contractor?	Yes, the plant must meet a 10 minute start. The plant control system, plant design, and any equipment supplied by the BOP Contractor must work with the GE supplied equipment to achieve the 10 minute start. Addendum 4 will contain additional definition.	CLOSED	
111	Can the payment of the Contract Price be by Milestone Payments according to mutually agreed milestones and percentages of the Contract Price (Appendix D 4.1)	Appendix D 4.1 contains the successful Bidder's Not to Exceed price to perform the project. Section 9.0 of Specification describes how payments will be handled. In order to submit a responsive bid, the Bidder must accept Section 9.0 in its entirety.	CLOSED	

Question #	Question	Answer	Status	Responsible Party
112	Typical contract would permit change orders for change in laws; unknown and unexpected underground conditions (obstructions, hazardous materials, artifacts); delays or costs caused by owner or owners other contractors; suspension by the City; grid connection not available by the schedule date; delays in customs not attributable to Contractor; Failure in the acquisition of licenses, permits and approvals due to governmental authority delays and or Statute rules, regulations issued by any governmental authority (in addition to force majeure and changes in scope). Will the BOP Contract include such? (Appendix D 4.2)	This is addressed in Sections 11 and 13 of the Specification.	CLOSED	
113	Contractor interprets this clause to mean that intellectual property of Contractor and Equipment suppliers shall remain their intellectual property. City will own the documents and have the right to use the documents with respect to the operation, maintenance and repair of the Plant. Please confirm. (Appendix D 6.3)	All work product prepared by the BOP Contractor that is a required deliverable under the contract becomes the property of the City of Pasadena.	CLOSED	
114	Contractor requests clarification that this clause does not prevent Contractor's ability to assign payment receivables to a financial entity. (Appendix D 6.7)	The City agrees this clause does not prevent the BOP Contractor from assigning payment receivables. The City, in the past, has allowed contractors to open an escrow account for special handling of invoices and retention payments.	CLOSED	
115	Can you add clarity that in the case of termination other than due to Contractor's default, City shall pay Contractor any and all payments due owing to Contractor on or prior to the date of termination, any prorated payments amount based on the services performed as per contractual requirements and timely performed prior to the service of the notice of termination, refund Contractor the Surety Bond/s and pay all reasonable, actual and direct costs including without limitation the cost of cancellation of subcontracts. (Appendix D 7.15)	This is addressed in Section 3.7 of the Specification.	CLOSED	
116	Contractor interprets that the period time to cure the material breach are 10 Business Days and request that the City confirm this interpretation (Appendix D 7.16)	Section 7.16 of the Contract speaks for itself. If a party sends a notice of default and termination, "the Contract shall terminate unless such default is cured before the effective date of termination stated in such notice, which date shall be no sooner than ten (10) days after the date of the notice."	CLOSED	

Question #	Question	Answer	Status	Responsible Party
117	Typically there would be a clause excluding incidental and consequential damages. Please confirm whether such will be included. (Appendix D)	Bidder's shall submit proposal as they deem competitive. If the bidder has clarifications or exceptions to the commercial terms only, they may submit them with their bids. The City is not inclined to exclude categories of damages for this project, but may be able to capitate certain types of losses to $20 million (i.e. for business loss coupled with debt service, the contractor may have a limited exposure City's capitated damages of $20 million per occurrence only)	CLOSED	
118	Typically there would be a clause limiting the Contractors liability. (Appendix D)	See response to item 117.	CLOSED	
119	What is the length of time for the material and workmanship warranty? (Appendix D)	The BOP Contractor will warrant materials and workmanship for a period of 12 months or the vendors warranty, whichever is longer, following the Acceptance of Work by the City per Part II (City Standard Spec), Section 10 (Completion of Work and Acceptance) of the Specifications.	CLOSED	
120	We note that City Council approval is required if change orders cause Contractors total compensation to exceed a certain amount. Approximately how much above the contract price is this expected to be? (Appendix D)	Section 4.2 of Appendix D will contain an amount that is greater than the Bidder's price as bid to perform the work which is contained in Section 4.1 of Appendix D. The standard change order for City contract is 10% of the contract amount. The City Manager has the authority to approve change orders up to this 10% amount. Change orders that are more than 10% of contract amount will need City Council approval.	CLOSED	
121	Please provide confirmation/clarification that "specialty" contractors (e.g.: insulation, painting, etc…) do not need to be identified in the bid	In accordance with Section 3.4 of the Specification, subcontractors that represent more than one-half of one percent (0.5%) of the Bidders bid price must be identified on Attachment 1 to the Specification.	CLOSED	
122	PLA agreement: Attachment E is blank. It is the document that is designed to list the unions signatory to this agreement. Please provide this list. (Appendix D)	The Project Labor Agreement is located in Appendix I (the letter "I") of the Specification.	CLOSED	
123	We are requesting a 3 week bid extension to April 8, 2014.	The bid due date is extended to April 8. The last day to submit questions is extended by the same amount to March 21.	CLOSED	
124	Please advise on the project tax exempt status for materials and equipment incorporated into the project.	There is no special tax exempt status for materials for this project.	CLOSED	
125	With the Maintenance Building removed from the scope of the project, per Pre-Bid Meeting Question 60, Rev. 0, is the Welding Shop also removed?	Yes	CLOSED	
126	Can the area around the Maintenance Building still be used for "parking and proposed laydown/staging area"?	Yes	CLOSED	
127	Is it acceptable to distribute material in the bid specification to third parties for the purposes of obtaining bids from suppliers and vendors.	Yes, however GE proprietary material may not be distributed beyond the Bidder.	CLOSED	
128	Attachment A.1 Scope of Work states in item 6 at the top of page 6 "…subject to the 50% self-performance requirement." Is there still a 50% self-performance requirement?	No, there is not a 50% self-performance requirement.	CLOSED	

Question #	Question	Answer	Status	Responsible Party
129	Please clarify the meaning of items 53010 and 53020 in the Division of Responsibility.	53010 - The PIE Contractor is responsible for delivering their equipment to the site. Any equipment that the PIE Contractor ships to the site via rail, will be delivered to the site by the PIE Contractor. The BOP Contractor assumes care, custody, and control of the PIE Contractor equipment when they off-load it from the PIE Contractor's truck/transporter. The BOP Contractor is responsible for the PIE from the time they off-load it from the truck/transporter until placement onto the foundation. 53020 - The BOP Contractor is responsible for movement from the rail siding to the site for equipment that the BOP Contractor procures and ships by rail.	CLOSED	
130	Part ID of the "Bidder's Proposal" in Specifications LD-13-14 appears to have some typos. Shouldn't the referenced attachments refer to section "G" vs. "F" of the Scope of Work, Attachment A.1? In addition, please confirm that Part ID only covers the bid items described in the "Demolition Requirements" portion of Attachment A.1.G. (i.e. – demolition of existing improvements), while Part IE covers the bid items described in the "Civil Requirements" portion of Attachment A.1.G. (i.e. – construction of new improvements)?	Yes, in Specification LD-13-14, Section D of the Bidder's Proposal Form should have referred to Attachment A.1.G instead of A.1.F. Yes, Part ID of the Bidder's Proposal Form only covers the bid items described in the "Demolition Requirements" portion of Attachment A.1.G. (i.e. – demolition of existing improvements), while Part IE of the Bidder's Proposal Form covers the new GT5 construction items described in the "Civil Requirements" portion of Attachment A.1.G.	CLOSED	
131	In Part ID of the "Bidder's Proposal" in Specifications LD-13-14, what is "Attachment A.1X"?	Attachment A.1.X is a placeholder for the Glenarm Building Mothballing Requirements which are being issued via Addendum. The Glenarm Building requirements are included within Addendum 3.	CLOSED	
132	In Part ID of the "Bidder's Proposal" in Specifications LD-13-14, shouldn't the unit process for Item Nos. D.2 – D.6 be in "CY" vs. "Ton" to maintain consistent units?	Yes, we will change these to cubic yards to maintain consistency.	CLOSED	
133	In Part ID of the "Bidder's Proposal" in Specifications LD-13-14, shouldn't there also be separate items with unit prices for the provided allowances for "Remove old house concrete foundations, bricks & asphalt near new tanks (100 CY)", and "Removal and recompaction of 2' – 3' of fill soil below AC roadways (3,380 CY)"?	This was provided in Addendum #3 Item #5 Enclosure #4.	CLOSED	
134	Can the cooling tower be moved to the south by 5-10 feet?	There is no latitude to move the cooling tower.	CLOSED	
135	What are the STG auxiliary heat loads?	The steam turbine auxiliary equipment cooling loads from GE/Shin Nippon are as follows: Lube oil cooler = 300 kW Generator cooler = 450 kW	CLOSED	

Question #	Question	Answer	Status	Responsible Party
136	Section 2.3.A.18 of the Shop Fabricated Tanks specification (Section 485173) indicates "All longitudinal and girth welds shall be 100% x-rayed." Can applicable requirements of API 650 and/or ASME be used instead?	The BOP Contractor should use the applicable code requirement for girth weld inspection.	CLOSED	
137	Will the design engineer be responsible for determining the Design Pressure and Design Temperature for the systems or are we to use what is listed in the Service Index?	Yes, the BOP contractor's engineer is responsible for determining design temperature and pressure.	CLOSED	
138	Are different pipe materials allowed to be substituted if deemed acceptable by the design engineer and if they will provide equivalent or superior long-term performance?	Use the pipe materials listed for the BOP Contractor's bid. Alternative materials may be considered after award of contract.	CLOSED	
139	Are Electrical Load lists for the following PIE supplied equipment available? We need these to adequately size and price the 480 V MCCs located in the PDC. · Chiller Electrical Load List · Shin Nippon STG Electrical Load List · IST OTSG Electrical Load List	We can provide estimates of the electrical loads, but the final power requirements are not available from the Power Island Equipment Contractor as yet. Here are estimates based on POWER Engineer's preliminary design and compared against GE's proposal: GT fuel compressor 1,095 kW GT electric chiller 370 kW GT chiller/heater water pump 330 kW HRSG feed pump 145 kW Cooling water pump 170 kW Cooling tower fans 180 kW Lights 10 kW Aux. from PEACE running motor/load list 485 kW Miscellaneous gas turbine auxiliaries 105 kW Miscellaneous steam cycle auxiliaries 35 kW Miscellaneous plant auxiliaries 40 kW Transformer losses 355 kW	CLOSED	
140	Is there an MCC located in the PIE supplied Chiller Package or are the Chiller 480 V loads being fed from the PIE MCC? A chiller MCC is not called out in the PDC layout plan.	The Chiller package is to be fed from the PIE MCC with two (2) 4160V feeds and two (2) 480 Feeds.	CLOSED	
141	Bid Form - Can the City of Pasadena provide the bid form in native Excel format?	No. The Bidder shall submit the Bidder's Proposal Form (Addendum #3 Item #5 Enclosure #4) completed in handwriting with their bids.	CLOSED	
142	Addendum #2 - Page #37 of Part 1 shows an elevation of the condenser. Can you please provide more complete information - plans, loads etc.	This is the best information we have from General Electric at this time. General Electric expects to finalize the condenser vendor selection at the end of March.	OPEN	Diane Donovan
143	Addendum #2 - Page #38 shows information for the foundation of the STG. Please provide the drawing that is referenced on this sheet: 5065A0-C23. There is also a conflict in the top of concrete elevation shown on this sheet with the top of concrete shown on Page 1700 of Attachment #3. Please clarify what the top of concrete elevation is for the STG.	This is the best information we have from General Electric at this time. The elevation of the steam turbine has not been set as yet.	OPEN	Diane Donovan

Question #	Question	Answer	Status	Responsible Party
144	Attachment #2 - BOI 037-5056 - Architectural Scope of Work Page 13 - Part 7: This calls for required activities in the Existing Glenarm Building and makes reference to details on drawing XXXXXX. Please provide this drawing so that we can comply with the required scope of work.	This information was provided in Addendum #3 Item 16 and Enclosure #7.	CLOSED	
145	Bid Form - Item #27 - Air Compressor & Receiver - What is the size of the enclosure for this equipment?	It is up to GE as to whether they will be supplying an enclosure or a shelter in order to meet their noise requirements. If GE does not provide an enclosure, then they will be providing a shelter (roof with open sides).	CLOSED	
146	Appendix G - In the "Local Subcontractor Solicitation Process for Contractors bidding on the Project:" section, it states in the second paragraph that "Forms shall be provided to the contractors to assist them in documenting the following steps." Please provide these forms.	The forms are provided in Appendix H.	CLOSED	
147	During the 1/8/14 project site visit, we overheard a PWP rep. state that the two existing on-site power poles, located on the west and south sides of the site, and their overhead utility lines would be removed by the City. Please confirm.	The overhead power line to the southwest of the Glenarm Building will be modified as follows: 1) the end pole to the southwest of the Glenarm Building will be removed 2) the next pole to the south, closer to the Pacific Electric building will remain. At that pole PWP will provide a 480V service drop. From there it is the BOP Contractor's responsibility receive and distribute the temporary construction power on-site.	CLOSED	
148	Due to the unknown hydraulic characteristics of the 6’ x 4’ storm drain box culvert, are backflow prevention valves required on any storm drain line connection to the 6’ x 4’ storm drain box culvert to prevent potential flooding of the site should the culvert become surcharged?	We are not aware of any surcharge conditions associated with the 6' x 4' storm drain box culvert. Recommend not including backflow preventers at this time. Contractor will go through a permitting process with the City for relocation of the storm drain and also for the grading permit and if new information is obtained at that time that the culvert can indeed see pressure conditions, the Contractor will need to address it.	CLOSED	
149	We assume that PWP wants the BOP Contractor to preserve and adjust as needed the existing catch basin at the west end of the 6’ x 4’ storm drain box culvert, while the two existing manholes (identified as “4’ & 5’ Dia. Lid Unknown” on Topo Survey), which lie in the middle of the plant proper, are to be removed. Please confirm.	Correct.	CLOSED	
150	We assume that the existing south plant entrance gate off State St. is to be removed and the bare ground around the PWP-removed backflow preventer is to be paved to match the existing roadway pavement elevations. Please confirm.	The gate at the south entrance shall be removed and replaced by the BOP Contractor with a wider gate with a similar mesh design as the one removed. The BOP Contractor shall install the necessary post and other appurtenances necessary to make the new gate operate properly. The area where the backflow preventer is removed will need to be paved. The paving should extend to the south and end at the existing gate, matching the existing sidewalk.	CLOSED	

Question #	Question	Answer	Status	Responsible Party
151	Please provide missing GE Packaged Power, Inc.'s Work Order No. 20001, "Area 1 Civil Plan Paving/Grading & U.G. Sewer", Dwg. No. 20001-C-002-02 ("Issued for Construction 1/24/03"), on the Pasadena Powerplant Upgrade Project. The four associated Dwg. Nos. 20001-C-002-01 & -03 thru -05 were provided as part of A.3, but Dwg. No. 20001-C-002-02 is missing.	The referenced drawing will be issued in Addendum #4.	CLOSED	
152	What is the extent of the existing gate and fence removal/replacement at the SE corner of the Glenarm Building where "New Asphalt Pavement" is shown on Dwg. No. C3-1?	This fencing will remain in place.	CLOSED	
153	The ammonia system shows 3x100% capacity pumps whereas the specification discusses 2x100% pumps. Which is correct?	The project requirement is for 3x100% pumps as shown on the P&ID.	CLOSED	
154	Can the City provide the GE guarantee sheet? If this is not available, can the City provide the amount of hours GE allows before PM10 compliance is void?	GE prefers to release the guarantees only to the successful BOP Contractor. With regards to PM10 testing, GE requires that the combustion turbine must run for a minimum of 300 total-fired hours prior to any PM testing, and must operate at base load for a minimum of 3 to 4 hours prior to any PM test run to achieve steady-state wheelspace temperatures (gas turbine nozzle final stage temperature). GE does not have a maximum number of fired hours before which the PM-10 test must occur to be valid, nor is there a degradation-type factor applied to PM-10 based on hours.	CLOSED	
155	After our review of the General Contract for the above subject project, we have identified a few typical reference clauses missing in an EPC contract. Appendix D of the request for bid does not reference any of the following clauses; namely, Price and Payment Terms, Warranty, Confidential Information, Consequential Damages, Contractor Liability, Environmental , Changes, Force Majeure, Owners Insurance/ Builders Risk Insurance. Please advise how the City plans to address these contract clauses.	Price and Payment Terms - Refer to Section 3.2 and the Bidder's Proposal Form of the Specification for pricing. Refer to Section 9.0 of the Specification for payment terms . Warranty - Refer to question #119 for the response. Confidential Information - The Bidder will be required to execute a Non-Disclosure Agreement with General Electric. Consequential Damages - Refer to question #117 for the response. Contractor Liability - Refer to question #117~~118~~ for the response. Environmental - Refer to question #117 for the response Changes - Refer to question #112 for the response. Force Majeure - Refer to Sections 11.1 and 22.7. Owners Insurance/ Builders Risk Insurance - Refer to question #160.	CLOSED	

Question #	Question	Answer	Status	Responsible Party
156	Attachment A-1, paragraph J.21.6.j has this statement: The underground duct bank systems shall have at least 20% spare conduits. We anticipate that the underground power cable bus from the CTG and STG to the 13.8kV switchgear will require a large number of parallel power cables, and as a result will have a very large duct bank. The same situation will apply to the low side connections for the auxiliary transformers T1 and T3. Please clarify if the 20% spare capacity requirement applies to these duct banks.	20% spare conduits are required for the duct banks as described in the Specification. The CTG to GSU Xfmr circuits are overhead and thus this requirement does not apply. For the following circuits the City will accept as an alternative sufficient spare conduit to accommodate the cables associated with one of the three phases: 1) STG to GSU Xfmr 2) Aux Xfmr T1 to PDC 3) Aux Xfmr T3 to PDC	CLOSED	
157	Please clarify if the “goal of at least 25% local hiring” in the Project Labor Agreement is a firm requirement or a true goal which we are to attempt/make best efforts to meet during the course of the project.	The 25% local hiring is the goal set under the PLA for the project. Contractor shall perform all outreach effort prescribed in the PFBL and described in Section 6 (Union Recognition, Referral & Employment of Pasadena Residents) of the PLA to meet this goal.	CLOSED	
158	Referring to Section 7.11.2 of the Sample Contract in Appendix D of the Specification, does the City intend to modify the Indemnity provision in the contract to comply with California law? The word “sole” should be replaced with the word “active” pursuant to California Civil Code Section 2782 (b) which provides as follows: Except as provided in Sections 2782.1, 2782.2, and 2782.5, provisions, clauses, covenants, or agreements contained in, collateral to, or affecting any construction contract with a public agency that purport to impose on the contractor, or relieve the public agency from, liability for the active negligence of the public agency are void and unenforceable.	The City is not attempting to be relieved from "active" negligence and nor does the existing contract language purport to do so. The contract is not in contravention of the California Civil Code as written.	CLOSED	
159	Referring to Section E in Appendix E of the Specification, if the Contractor reduces or eliminates the self-insured retentions, it will result in additional cost. Does the City intend to issue guidance about the amount of self-insured retention that will be acceptable to the City prior to the proposal date?	Bidders should submit proposal as they deem appropriate, to be competitive. Since each company has differing rates for each of its insurance coverage's, each company has differing risk tolerance, and risk appetite for self-insured retentions or deductibles. Each proposer will have to determine on its own its financial capabilities.	CLOSED	
160	Does the City intend to provide Builder’s Risk insurance for the full replacement value of the Work. If so does the City intend to disclose the terms of such coverage? If the City intends to provide Builder’s Risk insurance, will the	The BOP Contractor must provide Builder's Risk coverage as an option within their bid. Please refer to Addendum #4 for further details.	CLOSED	
161	17.2 kV is not a typical substation voltage. Is the new T3 Aux Transformer connected directly to a generator?	17.2 kV is the correct value. The T3 Aux Transformer is not connected to a generator.	CLOSED	

Question #	Question	Answer	Status	Responsible Party
162	Enclosure 10 of addendum 3 provides us with dates for owner furnished equipment deliveries. It provides both RTS (ready to ship) dates and guaranteed delivery dates. My question pertains to the guaranteed delivery date. Does the guaranteed delivery date provided pertain to the beginning of deliveries to the site or is it the date that we will receive the final delivery for that particular item?	The Guaranteed Delivery Date is the last day that GE may deliver the equipment to the site and not be liable for liquidated damages for late delivery. GE must provide not less than 5 day's notice prior to delivery to the site. Deliveries must occur on a business day before 2:00 PM local time, or as otherwise agreed with the City in writing. GE may issue a RTS notice up to 30 days prior to the RTS dates in the contract. Additionally they are required to use reasonable efforts to provide 10 days advance notice of issuing a RTS notice. GE may deliver the equipment up to 30 days prior to the Guaranteed Delivery Date.	CLOSED	
163	In many of the mechanical specifications, e.g. Section 485172 Field Fabricated Tanks - Steel, refer to Section 481200, Combined Cycle Balance of Plant. Where is Section 481200 located?	Section 481200 was originally going to be what is now Attachment A.1, the BOP Scope of Work. The references to Section 481200 should be back to Attachment A.1 and were inadvertently missed.	CLOSED	
164	Please clarify the incomplete sentence in the answer to Question #56, as underlined below: "Pasadena Fire Department review of submittals and reports, as well as required inspections, The current billing rate for reviews is $202/hr for the time required."	The sentence should have read as follows: Pasadena Fire Department review of submittals and reports, as well as required inspections, is required. The current billing rate for reviews is $202/hr for the time required.	CLOSED	
165	We have another question in response to your answer to Question #105: If the "existing AC paving can be left in place" (i.e. running N– S between east State St. and the new plant proper), shouldn't the quantity of "Bidder's Proposal" Bid Item D.8 "Remove and recompaction of 2' – 3' of fill soil below AC roadways" be reduced accordingly?	It may be possible to execute the project in the way described, in which case the unit rates will be used to reduce the Bidder's price.	CLOSED	
166	Enclosure 6 of Addendum #2 lists drawing E6-10 as revision C, 7-Jan-14, released in Addendum #2. However, Enclosure 4 in Addendum #2 for Civil Scope/Storm Drain Reroute has E6-10 listed as revision B. Is there in fact a revision C to drawing E6-10?	Revision C is the correct revision and is included in Addendum #4.	CLOSED	
167	Are there OTSG and STG P&IDs for the Glenarm Repowering Project available at this time?	Not at this time, as soon as they are available we will issue them in a future Addendum.	OPEN	Diane Donovan

City of Pasadena - Glenarm GT5
Pre-Bid Meeting Questions
Revision 3

Question #	Question	Answer	Status	Responsible Party
168	The proposed storm drainage system, as detailed on the 'Preliminary Grading & Drainage Plan' (dwg C3-1), does not appear to be sufficient for proper drainage of the site. Should additional catch basins and piping be considered for bidding purposes	We have taken a second look at the proposed storm drainage system as shown on Drawing C 3-1 and find it to be adequate. The BOP Contractor should consider that this arrangement is based on the preliminary information available at this time and they are responsible for the final drainage system design once all equipment sizes and locations are determined and integrated into the final general arrangement. If the bidder thinks that additional catch basin and piping are necessary, then they should consider it in their design and include it in the bid price. City Public works will review and approve the final design before start of construction.	CLOSED	
169	While reviewing the Bidder's Checklist we saw that one of the requirements under Bid Security, Item (a) Bid Bond, was that the Attorney-in-Fact be on file with the L.A. County Clerk or the Pasadena City Clerk. Our Attorney-in-Fact tried to file with Pasadena and was told that they will not file unless it is for 'Real Property.' We wanted to confirm if our Attorney-in-Fact must actually be on file for this project?	The bid security shall be signed & sealed (emboss seal) by the Attorney-in-fact. A Power of attorney for the Attorney-in-fact shall be attached with the bid security. With the Power of attorney attached to the bid document, this addresses the requirement that the Attorney-in-fact is on file with the City Clerk.	CLOSED	
170	The hazard reports provided in Addendum #3 do not provide the lengths/volume of asbestos to be removed in the tunnels outside the boundary of the Glenarm Building	Assume 10 cubic yards. Also provide a unit rate to be used to adjust the bid price based on the actual volume of asbestos. An updated bid form is provided in Addendum #4.	CLOSED	
171	Regarding Specification 485172 (Field Fabricated Tanks – Steel), the data sheet for the Demineralized Water Storage Tank requires a corrosion allowance of 1.5mm (1/16 in). Industry standard for tanks constructed with stainless steel plates requires a corrosion allowance of 0 in. The data sheet lists minimum thickness requirements and industry standard is provide design in accordance with API 650 Appendix S. Please review and advise.	No corrosion allowance is necessary for the stainless steel tank walls. Use the more conservative between the specification and API 650.	CLOSED	

Question #	Question	Answer	Status	Responsible Party
172	Project Document Attachment A-1 Scope of Work (please see page 134) requires the BOP Contractor to secure necessary construction permits from the City Planning Department and the Pasadena Fire Department, as well as any other construction related permits. The General Fee Schedule Spreadsheets in City of Pasadena's website list all permits that might be associated with this project some of which are listed below. • Page 7 – Hazardous Materials Permits / Inspections • Page 8 – Inspections & Permits (Excluding Hazardous Material) – Fire Department • Page 8 – Construction Permits (New, Alterations, Replacement, other than Haz.Mat.) • Page 12 – Permits related with Building Services • Page 14 – Construction Inspections, Permits, Reviews (including Building, Electrical, Mechanical & Plumbing) • Page 18 – Plan Check Fees Building • Page 27 – Tree Removal & Protection Plan Review • Page 28 – Design Reviews • Page 44 – Water and Power Department – Utility • Page 49 – Public Works Department – Construction & Demolition Fees We realize that Building Permit, Temporary Trailer Permits, Excavation Permit, SWPPP Permit, Transportation - Moving Permits, Conducting an Activity in Public Right of Way Permit, Placing a Storage Container in Public Right of Way Permits are the requirements specifically identified in the	The BOP Contractor is responsible for reviewing the list of fees and making its own determination as far which fees it may need to pay as part of putting its bid together. The following is provided as general guidance only and is not meant to imply what is or is not required. **Hazardous Materials Permits / Inspections** - Likely required for the site demolition work and removal of hazardous materials as well as the ammonia system work **Inspections & Permits (Excluding Hazardous Material)** – Fire Department - Likely required as the Fire Department will inspect the fire protection systems **Construction Permits (New, Alterations, Replacement, other than Haz.Mat.)** - Likely required for the new construction such as the control building, fire pump, **Permits related with Building Services** - Likely required for grading permit, control building, electrical, transformers **Construction Inspections, Permits, Reviews (including Building, Electrical, Mechanical & Plumbing)** - Likely required for new construction **Plan Check Fees Building** - Likely required for new construction **Tree Removal & Protection Plan Review** - Likely required for the trees near the Pacific Electric building **Design Reviews** - While permitting has been handled by the City, the 10' wall along Fair Oaks will likely require a review. **Water and Power Department – Utility** - Likely required for new electrical service connection **Public Works Department – Construction & Demolition Fees** - Likely required for street work/closures including the new State Street gate and a Traffic Control Plan	CLOSED	
173	Addendum 4, item 25 requires EPC contractor to provide cost of Builders Risk insurance. To provide that quotation, the value of the Owner furnished PIE equipment needs to be provided to us before we can go out for a quote for that.	See the response to question 177.	CLOSED	

Question #	Question	Answer	Status	Responsible Party
174	Page 1, Section 1.2.D Specifies that all workstations/servers are to be rack mount. Please confirm since there are conflicting requirements throughout the spec. (I.E. Page 13, Section 1.8.A.4.b specifies the OWS to be desk mount server.) Page 4, Section 1.3.B.2 & 2.4 – Specifies four (4) monitor per OWS, but the architectural layout only shows one OWS with (4) monitors and the other OWS with (2) monitors. Please confirm the exact number of monitors per OWS. Page 4, Section 1.3.B.3 – specifies two (2) EWS's, however, page 13, section 1.8.A. 2 & 1.8.A.4.b specifies one (1) EWS & page 23, section 2.5 specifies two (2) EWS. Please advise. Page 4, Section 1.3.B.4 & Page 24, section 2.6 – Please provide more information on the remote workstations--are they stand alone, what are they connected to, what are they monitoring?	Work stations are at desks and to have a standing tower box. Servers are to be rack mounted. Use the configuration as shown on the Control System Architecture Diagram. One (1) EWS is required. Delete the Remote Work Stations referred to in Section 1.3.B.4 (Page 4) and Section 2.6 (Page 24) of the PCS/Control System Specification 4780.	CLOSED	
175	Please provide load list for low voltage (480v) PIE, GTG and STG Motor Control Centers.	Refer to the responses to questions #135 and #139.	CLOSED	
176	Section I.1.7 of Attachment A.1 states that specifications for the steam sample panel are included in Attachment A-2. No specifications for a sample panel could be located in A-2 other than a reference to one located in Section 485952.06 for chemical feed - Section 485951.80, "Steam Sample Panel". Please provide Section 485951.80.	The Steam Sample Panel specification is included in Addendum #5.	CLOSED	

Question #	Question	Answer	Status	Responsible Party
177	To provide builders risk pursuant to the addendum 4 requirements below, we will need to know the value of the facility that we could potentially damage in order to accurately price the builders risk policy. Please provide.	The Course of Construction, Builder's All Risk policy shall have limits commensurate with the total value to replace the entire project in the event of catastrophic loss. The Builder's Risk policy needs to include the value of the equipment - Bidder shall use a value of $70 million - as well as other costs to replace the project. Further, item 25 of Addendum #4 is modified as follows: BOP Contractor shall provide at its own expense Builder's All Risk Insurance through the end of the Warranty Period. The insurance shall insure the BOP Contractor, PIE Contractor, and the City against all risks of damage to new buildings, structures, equipment, and materials that are part of the Work~~, as well as damage to the Broadway and Glenarm power plant attributed to performance of the Work~~. The Builder's All Risk policy shall insure against all risks, including without limitation risks of: a) any direct physical loss or damage to the Work~~, the Broadway and Glenarm power plant, or any portion thereof~~ from any cause, including without limitation flood, earthquake or tidal wave; b) any mechanical or electrical breakdown that occurs during any performance testing or other testing or operation of any component associated with the Work;	CLOSED	
178	Please provide the unit cost of the water indicated below that will be provided "at cost": i. construction ii. potable iii. raw iv. treated water sources	• A non-refundable initial connect fee of $150.00 • A refundable deposit of $981.01 • The monthly charge of $385.08 to be prorated for the opening and closing bill • The charge for one billing unit (100 cu. ft.) is $1.19885 from to October to March; and $1.12537 from April to October • The meter needs to be picked up at Meter Reading Services. • Contractor needs to send Billing the reads by the end of each month. Meter Reading will provide cards for the reads. Demin water from the plant will be provided at no cost, however it is only to be used for purposes requiring demin water.	CLOSED	
179	RFP Attachment A-1 Scope of work indicates the following; One Innovative Steam Technologies single pressure un-fired once through steam generator (OTSG) with stack, stack damper, platforms, SCR equipment, and tempering air fans i. Orbital welding of the OTSG tubes to the headers using IST's proprietary process is not within General Electric's scope of supply. ii. The BOP Contractor will contract separately with IST to perform the welding. iii. IST's price to perform this work is ~$80,000. Will IST also perform handling and fit-up of the jumper tubes or only tacking/welding?	Based on the IST proposal P12079-00 Jumper Tubes, IST is responsible for fit-up of the jumper tubes and completion of orbital welds using welding equipment provided by IST. The list of equipment, consumables, and manpower supply by the Erector is listed in the proposal. IST's proposal is included in Addendum #5.	CLOSED	

Question #	Question	Answer	Status	Responsible Party
180	We have a vendor who batches and sells concrete out of many locations, including the city of Pasadena. However they invoice out of a central office not in Pasadena. Does the concrete coming out of the Pasadena batch plant count as a Pasadena purchase even though the invoice has a non-Pasadena address on it?	If the company is truly in Pasadena (within the City boundary), the answer is yes. However, our suggestion is that the invoice include the Pasadena address where which the company is located.	CLOSED	
181	Will we be allowed/able to coordinate OTSG deliveries in a manner that allows deliveries of heavy sections (upper and lower modules) to be sequenced such that we can off-load directly on to foundation or prior piece in sequence of erection? Same question applies to all GE furnished heavy equipment (generators, turbines, etc.)	PWP will work with the PIE Contractor and the BOP Contractor to facilitate having the loads arrive in sequence, however we cannot guarantee the PIE Contractor's performance beyond the delivery dates and information provided in the responses to questions #`5, #129, and #162. GE's obligation is to deliver the equipment to the site. As explained during the site walk, the equipment will be delivered to the laydown space off Glenarm. From there the BOP Contractor will need to transport the equipment to the foundation.	CLOSED	
182	Per excerpt below we get 90 days from first fire to COD. Of those 90 days GE utilizes 76 unimpeded days. Please confirm we will be allowed to perform necessary work during this 90 day period as long as it is coordinated with and does not impede GE. 8.5.3 90-Day SCAQMD Permit Window (i) As described in Attachment A.1.B, "Project Description", the new generating unit must achieve COD within ninety calendar days of First Fire. (ii) The Power Island BOP Contractor shall have seventy-six (76) unimpeded calendar days, not necessarily continuous, following First Fire, in order to perform the various tests required under its contract. The BOP Contractor shall not interfere or cause the Power Island BOP Contractor's work to be impeded during this period. (iii) BOP Contractor shall have fourteen (14) calendar days, not necessarily continuous, in which it is required to perform the post-First-Fire work activities under these specifications, including but not limited to OTSG burnout and catalyst installation, steam blows, flushing and final cleaning, and replacement of temporary piping with final	Yes, PWP will work to promote close coordination between the Power Island Equipment Contractor, BOP Contractor, and PWP Operations. Please note that 8.5.3 (ii) should have read "The Power Island BOP Contractor shall have seventy-six (76)…"	CLOSED	

Question #	Question	Answer	Status	Responsible Party
183	The existing site has minimal amount of parking-laydown-staging area. More laydown will be necessary (estimated approximately 3 acres). We have not been able to locate any area/laydown available off-site but within the City of Pasadena to lease for this need and wanted to know if the City of Pasadena has any property inside the City limits that may be available for lease?	The City does not have any available space for lease.	CLOSED	
184	The PCS Plant Control System Specification section 1.3.A.3. states: "Ethernet based communications to the following subsystems (data only): a. GTG Units 1,2,3,4. Approximately 400 points. (240 digital, 160 analog)" Is there only one interface for all GTG Units 1,2,3,4 or is there to be one separate interface to each unit for 4 total?	They can be interfaced in pairs with two separate interfaces 1&2 and 3&4.	CLOSED	
185	The RFP requires we submit a baseline schedule within 30 days of NTP. We think that is very aggressive and request that be changed to 90 days.	The City agrees to change this to sixty (60) days.	CLOSED	
186	This question is asked on the basis that we will have our PDC entirely pre-fabricated (including GE supplied components) at the place of manufacture. As it pertains to the GE ship loose items that need to be installed in the PDC we procure, can we assume for our pricing that GE will ship those items to our PDC manufacturer and that they will do so in a manner that does not delay our PDC manufacturer?	The delivery date for a panel(s) is the same as the delivery date for the equipment the panel is associated with. The panels will be shipped to the PDC vendor the BOP Contractor is using.	CLOSED	
187	Specifically but not limited to the requirements of addendum 4, item 6: Please define what the BOP contractor is to supply which will facilitate the PIE contractor's 10 minute start requirement as most of the equipment required for the 10 minute start is outside of the BOP contractor's scope of supply. Please provide a Terminal Point list with process requirements.	The primary contribution of the BOP Contractor is the control system. The control system must coordinate all elements of the plant, both those supplied by the BOP Contractor (breakers for example) and the PIE Contractor (gas compressor, gas turbine, etc.).	CLOSED	

Question #	Question	Answer	Status	Responsible Party
188	We received a partial answer to our questions below with your item 170 of addendum 4 concerning asbestos quantity. Would you be able to tell us where the costs for the environmental consultant engineer and the geotechnical consultant engineer are to be included on the cost sheets?	Costs associated with the base scope of work should be included in your engineering, demolition, and/or construction costs as you feel most appropriate. Costs associated with the scopes of work where we have provided quantities and unit rates should be included in the responses to those items.	CLOSED	
189	Item D.3 in the addendum 4 bid form starts out asking for prices for import and then goes on to ask for a price for transportation and disposal. Please clarify.	The pricing should address both the cost of importing the fill as well as transportation and disposal of any material. The bid form has been revised and is included in Addendum #5.	CLOSED	
190	We have a question for you concerning Addendum 4 item 10. The BOP contractor is not supplying the 5th bullet noted…One running Auxiliary Cooling Water Pump. As we discussed by phone, this pump is provided by the PIE Contractor and should not be a part of the 250 kW LD BOP electrical load calculation. Please confirm this understanding and remove this pump from the aux load attributable to the BOP Load as listed under item 10 of addendum 4.	You are correct, the Auxiliary Water Cooling Water pump is not part of BOP Contractor Auxiliary Load guarantee.	CLOSED	

Enclosure 2

ADDENDUM 5

SPECIFICATIONS LD-13-14

BIDDER'S PROPOSAL

FOR
PROVIDING LABOR AND MATERIALS

FOR

GLENARM REPOWERING BALANCE OF PLANT DESIGN AND CONSTRUCTION

To the Honorable City Council
of the City of Pasadena, California

Gentlemen:

In response to the Notice Inviting Bids for the Glenarm Repowering Balance of Plant Design and Construction for the City of Pasadena, Water and Power Department, the undersigned hereby proposes and agrees to provide all necessary and incidental labor, supervision, transportation, materials, construction equipment, tools, engineering, testing, sampling, and analysis , to satisfactorily complete the Work in strict conformity with the Specifications all approved Addenda for the firm prices hereinafter indicated.

PART I - ITEMIZED COST PROPOSAL					
	Bid Item	**Quantity**	**Description**	**Unit Price**	**Total Amount**
A	**GENERAL CONDITIONS**				
	A.1	LS	Insurances, Bonds, Mobilization, Offices, Overheads	Lump Sum	$_____
	A.2	LS	Building Permits	Lump Sum	$_____
	A.3	LS	Sales and Use Tax (if any)	Lump Sum	$_____
	A.4		Part IA SUBTOTAL		$_____

ADDENDUM 5

B	**ENGINEERING**				
	B.1	LS	Detailed Engineering, Studies and Submittals	Lump Sum	$_____
	B.2	LS	Sales and Use Tax (if any)	Lump Sum	$_____
	B.3		Part IB SUBTOTAL		$_____
C	**EQUIPMENT SUPPLY**				
	C.1	LS	Furnish Plant Control System software, programming, cabinets and all necessary hardware per Attachment A.2 PCS/Control System Specification (037-4780).	Lump Sum	$_____
	C.2	LS	Furnish, Power Distribution Center, including switchgear, breakers and all other associated equipment per Attachment A.2 Section 262600 Power Distribution (PDC)	Lump Sum	$_____
	C.3	LS	Furnish auxiliary transformers per Attachment A.2 Section 261200-2 (Medium Voltage Auxiliary Transformers)	Lump Sum	$_____
	C.4	LS	Balance of Engineered Equipment	Lump Sum	$_____
	C.5	LS	Sales and Use Tax (if any)	Lump Sum	$_____
	C.6		Part IC SUBTOTAL		$_____

ADDENDUM 5

D	**DEMOLITION, REMEDIATION, EARTHWORK, PAVING**				
	D.1	LS	Exclusive of D.2 through D.8 which are provided separately below: Demolition of Existing Above Grade Site Infrastructure; Storm Drain Relocation, including demolition and haul-off of existing storm drain culvert; Stockpiling, Backfilling, Dirt Importation, Topo & Site Survey; Site fences and gates; Site Preparation, Grading & Drainage, Roads & Paving, Sidewalks & Landscaping; State Street Improvements; Erosion & Sediment Controls; Sanitary Sewer Connections; & Making of all Facility Interfaces per BOP Scope of Work in Attachment A.1 Section G of the Specifications as well as all applicable and approved Addenda.	Lump Sum	$_____
	D.2	700 CY (Cubic Yards)	Concrete demolition for tunnels, stack foundations, train tracks, gantry crane per the BOP Scope of Work in Attachment A.1 Section G.2 and any approved Addenda. Provide lump sum price for the transportation and disposal of 700 CY, and a $/CY for adjustments up and down from 700 CY.	$____/CY	$_____

ADDENDUM 5

D	**DEMOLITION, REMEDIATION, EARTHWORK, PAVING**				
	D.3	2,500 CY	Provide lump sum price for 1) for the importation of fill, that includes cost of fill material as well as labor/equipment/tools, to fill tunnel voids per the BOP Scope of Work in Attachment A.1 Section G.2 and any approved Addenda, and 2) the transportation and disposal of 2,500 CY. Also provide a $/CY for adjustments up and down from 2,500 CY. The $/CY shall include import fill price, transportation, and disposal.	$____/CY	$_____
	D.4	1,300 CY	Organics removed from site per the BOP Scope of Work in Attachment A.1 Section G.2 and any approved Addenda. Provide lump sum price for the transportation and disposal of 1,300 CY and a $/CY for adjustments up and down from 1,300 CY.	$____/CY	$_____
	D.5	13,000 CY	Over-excavate and re-compact soils, but not removed from site per the BOP Scope of Work in Attachment A.1 Section G.2 and any approved Addenda. Provide lump sum price for the 13,000 CY and a $/CY for adjustments up and down from 13,000 CY.	$____/CY	$_____
	D.6	25 CY	Lead contaminated soil, removed from site and disposed per the BOP Scope of Work in Attachment A.1 Section G.2 and any approved Addenda. Provide lump sum price for the 25 CY and a $/CY for adjustments up and down from 25 CY.	$____/CY	$_____

ADDENDUM 5

D	**DEMOLITION, REMEDIATION, EARTHWORK, PAVING**				
	D.7	100 CY	Remove old house concrete foundations, bricks, and asphalt near new tanks from the project site and dispose of them per the BOP Scope of Work in Attachment A.1 Section G.2 and any approved Addenda. Provide lump sum price for the 100 CY and a $/CY for adjustments up and down from 100 CY.	$____/CY	$_____
	D.8	3,000 CY	Remove and recompaction of 2' – 3' of fill soil below AC roadways per the BOP Scope of Work in Attachment A.1 Section G.2 and any approved Addenda. Provide lump sum price for the 3,000 CY and a $/CY for adjustments up and down from 3,000 CY.	$____/CY	$_____
	D.9	10 CY	Remove asbestos from within the circulating water tunnels underlying the site and outside of the Glenarm Building	$____/CY	$_____
	D.10	LS	Sales and Use Tax (if any)	Lump Sum	$_____
	D.11		Part ID SUBTOTAL		$_____

ADDENDUM 5

E	GT5 CONSTRUCTION EXCLUSIVE OF DEMOLITION CONTAINED IN PART D				
	E.1	LS	Civil Construction as described in Attachments A.1, A.2, and A.3 of the Specifications and any approved Addenda.	Lump Sum	$_____
	E.2	LS	Structural Construction as described in Attachments A.1, A.2, and A.3 of the Specifications and any approved addenda	Lump Sum	$_____
	E.3	LS	Mechanical Construction as described in Attachments A.1, A.2, and A.3 of the Specifications and any approved Addenda.	Lump Sum	$_____
	E.4	LS	Electrical Construction as described in Attachments A.1, A.2, and A.3 of the Specifications and any approved Addenda.	Lump Sum	$_____
	E.5	LS	I&C Construction as described in Attachments A.1, A.2, and A.3 of the Specifications and any approved Addenda.	Lump Sum	$_____
	E.6	LS	Furnish all materials and labor for the erection of the new Water Lab per the BOP Scope of Work in Attachment A.1 Section F, Attachment A.2 Architectural Scope of Work, and any approved Addenda	Lump Sum	$_____
	E.7	LS	34.5kV work between GSU and on-site 34.5kV vault per the BOP Scope of Work in Attachment A.1 Section J and any approved Addenda.	Lump Sum	$_____

ADDENDUM 5

E	**GT5 CONSTRUCTION EXCLUSIVE OF DEMOLITION CONTAINED IN PART D**				
	E.8	LS	17kV work between Aux Transformer Bank and on-site 17kV vault per the BOP Scope of Work in Attachment A.1 Section J and any approved Addenda.	Lump Sum	$_____
	E.9	LS	Sales and Use Tax (if any)	Lump Sum	$_____
	E.10		Part IE SUBTOTAL		$_____
F	**STARTUP, COMMISSIONING AND TRAINING**				
	F.1	LS	Startup and Commissioning per the BOP Scope of Work Attachment A.1 Section P and any approved Addenda.	Lump Sum	$_____
	F.2	LS	Allowance for craft support for power island contractor based on two pipe fitters and two electricians for a period of 3 months working a 6-10 schedule. Time will be billed on a T&M basis.	Lump Sum	$_____
	F.3	LS	Training, and O&M Manual Assembly per the BOP Scope of Work in Attachment A.1 Section Q and any approved Addenda.	Lump Sum	$_____
	F.4	LS	O & M Manuals per Section R in BOP Scope of Work in Attachment A.1 and any approved addenda.	Lump Sum	$_____
	F.5	LS	Sales and Use Tax (if any)	Lump Sum	$_____
	F.6		Part IF SUB TOTAL		$_____

ADDENDUM 5

G	**CONTROL ROOM**				
	G.1	LS	Furnish all materials and labor for the erection of the new Operations and Control Building per the BOP Scope of Work in Attachment A.1 Section F and Attachment A.2, Architectural Scope of Work and any approved Addenda	Lump Sum	$_____
	G.2	LS	Sales and Use Tax (if any)	Lump Sum	$_____
	G.3		Part IG SUB TOTAL		$_____
H	**OTHER CONSTRUCTION REQUIREMENTS**				
	H.1	LS	Provide all materials and labor for Spare Parts, tools, & Storage requirements of Section M, as well as the construction requirements in Section N of the BOP Scope of Work in Attachment A.1 and any approved Addenda.	Lump Sum	$_____
	H.2	LS	Sales and Use Tax (if any)	Lump Sum	$_____
	H.3		Part IG SUB TOTAL		$_____
I	**BUILDER'S ALL RISK INSURANCE**				
	I.1	LS	Provide Builder's All Risk Insurance per Addenda #4 and any approved Addenda	Lump Sum	$_____

PART II - GRAND TOTAL PRICING		
Grand Total = A.4 + B.3 + C.6 + D.11 + E.10 + F.6 + G.3 + H.3+I1	Lump Sum	$_____

Each bidder must bid on all of the above items. If any bidder makes any alteration, interlineation or deviation in any of the printed matter of the proposal or if the signature of the bidder is incomplete, the bid will be considered informal and may be rejected.

ADDENDUM 5

Refer to section 3.2 in case of a discrepancy between the Item Prices and the Total Price.

The prices quoted herein include all applicable federal, state, local, and other taxes.

The undersigned bidder agrees to commence work on the start date indicated in the Notice to Proceed and proposes and agrees to have the Work completed by the date specified in Section 8.1.

The undersigned bidder acknowledges receipt of the following addenda issued for the above project. If no addenda have been received, write "none". FAILURE TO ACKNOWLEDGE RECEIPT OF ANY ADDENDA ISSUED WILL RENDER THE CONTRACTOR'S BID NON-RESPONSIVE.

List of Addenda Received:

Addendum No.	Bidder's Initials
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____

The bidder declares that neither he nor any member of his firm or corporation is an officer or an employee of the City of Pasadena.

California State Contractor's License Number _____

The undersigned certifies that he is an official legally authorized to bind their firm and to enter into a contract should the City accept this proposal.

Bid proposal by

_____

(Name of Firm)

Legal status of bidder: (Please check the appropriate box)

A. Corporation ____ State of Incorporation _____

B. Partnership ____ List Names _____

_____

_____

C. DBA ____ State Full Name _____ DBA

ADDENDUM 5

_____
_____

D. Other ____ Explain _____
_____
_____

Signature of Bidder _____ Title _____
(Authorized Signature)

Print Name _____

Address _____ City _____ Zip _____

Telephone No. _____

Signed this _____ day of _____ 2014

Enclosure 3

ADDENDUM 5

SPECIFICATIONS LD-13-14
BIDDER'S CLARIFICATIONS and EXCEPTIONS

Bidder:_____

For each Clarification or Exception, please indicate which it is, provide a specific reference to the section of the Specification being addressed, and provide a proposed resolution.

☐ Clarification or ☐ Exception (Check One)

Specification Reference: _____

Proposed Resolution: _____

Add additional items as needed.

Enclosure 4

CONFIDENTIALITY AGREEMENT

BETWEEN

_____

AND

THE CITY OF PASADENA

I. PARTIES

The parties to this Agreement are _____, a _____ corporation, with headquarters at_____, and the City of Pasadena, a California municipal corporation, 100 North Garfield Avenue, Pasadena, CA 91109 (collectively, the "Parties").

II. RECITALS

The Parties recognize that the forces of competition require that the confidentiality of information and those matters which the Parties possess as proprietary matters, must be maintained in order for both parties to effectively compete in the marketplace. It is the intent of the Parties, to the extent allowed by law, to maintain the confidentiality of such matters, items and information on the terms and conditions set forth herein in connection with potential consummation of a utility transaction.

III. DEFINITIONS

(a) The term "Agreement" means this Confidentiality Agreement;

(b) "Confidential Information" means written information furnished by either party, its directors, officers, employees, members, agents, financing sources, or representatives, including, without limitation, its attorneys, accountants, consultants and advisors (collectively "Representatives") which shall be clearly marked or otherwise adequately identified as "Confidential" or "Proprietary" by the originating party at the time that it is given to the receiving party. Confidential Information shall also include any notes, summaries, reports, analyses or other material derived by the receiving party or its Representatives in whole or in part from the Confidential Information in whatever form maintained. Such information will remain the property of the originating party. Confidential Information shall not include information which (i) is disclosed with the prior written consent of the originating party, (ii) at the time of disclosure is within the public domain through no breach of this Agreement by either party, (iii) has been known or independently developed by and is currently in the possession of either party prior to disclosure hereunder, (iv) was or is acquired from a third party who did not, to the receiving party's knowledge, breach an obligation of confidentiality by disclosing it to either party, (v) is disclosed in official statements or other disclosure statements relating to the issuance of bonds, notes, commercial paper or other evidences of indebtedness under customary financial practices, or (vi) is required to be disclosed to comply with any applicable law, order, regulation or ruling or other legal requirement, including but not limited to, oral questions, discovery requests,

subpoenas, civil investigations or similar processes; provided, however, the receiving party shall give the originating party timely notice of any such disclosure pursuant to this Agreement. The Parties recognize that the City of Pasadena is a public entity subject to the California Public Records Act and the Ralph M. Brown Act.

IV. PERMITTED USE OF CONFIDENTIAL INFORMATION

The receiving party may disclose such Confidential Information to those Representatives (as defined above) of the receiving party with a need to know such Confidential Information for purposes of this Agreement. Such Confidential Information will not be used for any purpose other than evaluating and developing a proposed utility transaction between the Parties. Each party shall take reasonable care to prevent its Representatives from unauthorized disclosure of the Confidential Information.

V. NOTIFICATION OF DISCLOSURE

If a party is requested or required pursuant to any applicable law, order, regulation or ruling, discovery request, subpoena, or similar process to disclose any of the Confidential Information, such party shall provide prompt written notice to the other party of such request or requirement so that at such other party's expense, such other party can seek a protective order or other appropriate remedy concerning such disclosure. Notwithstanding anything contained in this Agreement, the City of Pasadena shall not be in breach of this Agreement or have any liability whatsoever under this Agreement or otherwise for any claims or causes of action whatsoever resulting from or

arising out of copying or releasing to a third party any Confidential Information pursuant to the California Public Records Act, the Ralph M. Brown Act or other applicable law.

VI. DISCLAIMER OF ACCURACY, COMPLETENESS

Each party acknowledges that although it has endeavored to include in the Confidential Information those materials that are believed to be reliable and relevant for the purpose of evaluation, neither party nor its respective Representatives make any representation or warranty as to the accuracy or completeness of the Confidential Information, except as set forth in any separate agreement between the receiving party and the originating party. Each party agrees that neither party, nor its Representatives, shall have any liability to the other party or its Representatives for use of the Confidential Information to evaluate the transaction referred to above.

VII. NO OBLIGATION TO PROCEED

The Parties expressly acknowledge that this Agreement is not to be construed as a letter of intent or any kind of commitment to enter into the transactions referred to above. The Parties further acknowledge that any expenses either may incur in evaluating the referenced transaction will be its sole responsibility unless otherwise agreed in writing.

VIII. NO LICENSE RIGHTS

Supplying of Confidential Information shall not be considered to provide any license or proprietary rights, including any implied patent license.

IX. REMEDIES

If either party becomes aware that it has made an unauthorized disclosure of the other party's Confidential Information to a third party, the violating party shall promptly take reasonable action to recover the improperly disclosed Confidential Information and promptly notify the party whose data was improperly disclosed ("Injured Party") and will use reasonable efforts to provide information about the nature of the unauthorized disclosure and the corrective measures being taken. The parties agree that monetary damages are inadequate for any material breach involving an unauthorized disclosure when the Injured Party reasonably believes said breach will cause it to suffer significant business harm. If the Injured Party reasonably believes, based on the facts, it will suffer material harm from the unauthorized disclosure and the corrective measures being taken by the violating party are inadequate to mitigate this harm, the parties agree the Injured Party shall be entitled to prompt injunctive relief. Both parties' other legal and equitable remedies and defenses remain unchanged by this provision except that each party specifically agrees that any damages shall be limited to direct actual damages and in no event shall such damages include any indirect, consequential damages or punitive damages.

X. GOVERNING LAW

The Parties agree that this Agreement is being made and entered into in the County of Los Angeles and shall be governed by, interpreted and enforced in accordance

with the laws of the State of California, without regard to conflict of law principles.

XI. VENUE

All litigation arising out of, or relating to this Agreement, shall be brought in a State or Federal Court in the County of Los Angeles in the State of California. The parties irrevocably agree to submit to the exclusive jurisdiction of such courts in the State of California and waive any defense of forum non conveniens.

XII. COMPLETE AGREEMENT

This Agreement contains the entire agreement and understanding concerning the subject matter hereto the Parties hereto. This Agreement may not be modified or amended, except by a writing signed by both parties hereto. This Agreement shall be effective on the date signed by the last Party to sign.

XIII. WAIVER

No waiver of this Agreement, or any of the terms or provisions hereof, shall be binding upon either party hereto unless confirmed in writing. No waiver by either party hereto of any term or provision of this Agreement or of any default hereunder shall affect such party's rights thereunder to enforce such term or provision to exercise any right or remedy in the event of any other default, whether or not similar.

XIV. ASSIGNMENT

Neither party may assign or transfer its rights or obligations hereunder nor any interest therein, in whole or in part, without the prior written consent of the other party

and any attempt to so assign or transfer without such consent shall be null and void and of no force or effect.

XV. SUCCESSOR AND ASSIGNS

This Agreement shall be binding on the Parties and their successors and permitted assigns.

XVI. SEVERABILITY

If any provision of this Agreement shall be held void, voidable, invalid or inoperative, no other provision of this Agreement shall be affected as a result thereof, and accordingly, the remaining provisions of this Agreement shall remain in full force and effect as though such void, voidable, invalid or inoperative provisions had not been contained herein.

XVII. REPRESENTATION; ATTORNEYS' FEES

Both Parties acknowledge and agree that each was represented by legal counsel during the negotiation and execution of this Agreement. Both Parties agree that in any action to enforce the terms of this Agreement, each party shall be responsible for its own attorneys' fees and costs.

XVIII. TERM

The term of this Agreement shall be for a period of five (5) years from the date of disclosure of the Confidential Information.

IN WITNESS HERETO, the Parties hereto have caused their duly authorized representatives to execute this Agreement.

DATE: _____

By: _____

Name:_____

Title: _____

DATE: _____ CITY OF PASADENA

By:_____

Name:_____

Title:_____

Approved as to form:

_____
Deputy City Attorney

Enclosure 5

hydrologue, Inc.
Consulting Engineers & Geologists *http://www.hydrologue.com*
Remediation Engineering *Hazardous Substances* *Geology and Hydrogeology* *Geotechnical Engineering*

March 12, 2014 Project No. 3626-04-01-02

Mr. Dan Angeles
City of Pasadena
Water and Power Department
85 East State Street
Pasadena, California 91105-3418

SUBJECT: Revised Seismic Design Calculations
Proposed Glenarm Repowering Project
(GT-5 Combined Cycle Installation)
City of Pasadena Power Plant
Southeast corner of Fair Oaks Avenue and East Glenarm Street
Pasadena, California

1. SOIL ENGINEERING INVESTIGATION, Proposed Glenarm Repowering Project, (GT-5 Combined Cycle Installation), City of Pasadena Power Plant, Southeast corner of Fair Oaks Avenue and East Glenarm Street, Pasadena, California, Hydrologue Report No. 3626-04-01, dated August 1, 2011.
2. SOIL ENGINEERING INVESTIGATION, Proposed 65 MW Combined Cycle – Repowering Project, City of Pasadena Power Plant, 72 East Glenarm Street, Pasadena, CA 91105, Hydrologue Report No. 3626-00-01, dated January 28, 2010.
3. SOIL ENGINEERING INVESTIGATION, Proposed Operation Building Center, at the Jacob Parking Lot, 72 East Glenarm Street, Pasadena, CA 91105, Hydrologue Report No. 3626-01-01, dated February 2, 2010.
4. Summary of Additional Soil Assessment Activities (Phase III), Glenarm Steam Plant Property, City of Pasadena Water and Power Department, 72 East Glenarm Street, Pasadena, California, by Pacific Environmental Group/ The IT Group, Inc. Report No. 640-001.1B, dated September 3, 1999.
5. Report of Soil Investigation, Pasadena Water and Power Plant, by Hunter-Kennedy and Associates, Inc., dated July 30, 2003.
6. Soils Engineering Investigation, Proposed Gas Turbine Generators, Broadway and Glenarm Power Plant, Pasadena, California, Hydrologue report No. 2391-00, dated April 3, 2002.
7. Soils Engineering Investigation, Proposed Compressor, Cooler and Above Ground Storage Tank, 130 Wallis Street Power Plant, Pasadena, California, Hydrologue Report No. 2435-00, dated July 18, 2002.
8. Foundation Investigation Proposed Turbine Generators at Glenarm Plant, Fair Oaks and Glenarm, Pasadena, California, Converse Davis and Associates Project No. 73-026-A, dated February 12, 1973.

9. Foundation Investigation Proposed Fuel Storage Tank Relocation Glenarm Steam Plant, Fair Oaks Avenue and Glenarm Street, Pasadena, California, Converse Davis and Associates Project No. 73-191-A, dated October 23, 1973.
10. Soils Engineering Investigation, Proposed Water Treatment and Water Storage Tank, 130 Wallis Street Pasadena Power Plant, Hydrologue Report No. 2540-00, dated December 10, 2002.
11. Draft Geotechnical Summary Report SR-710 Tunnel Technical study, Los Angeles County, California, Report No. EA-07-187900, Prepared by CH2MHILL, dated October 2009.
12. Geotechnical Report for the Route 7 Freeway Corridor, from Route 10 to 210, in and Near the Cities of Los Angeles, South Pasadena, Pasadena and Alhambra, Report No. 625.732, Prepared by Materials and Environmental Investigation Section of the Engineering Branch, District 7, California Department of Transportation, dated January 1974.
13. Preliminary Geologic Hazards Evaluation for Pasadena Unified School District, San Rafael Elementary School, 1090 Nithsdale Road, Pasadena, California 91105, Hydrologue Report No. 3866-01, dated September 2, 2009.
14. Geotechnical Investigation, Proposed New Classroom Buildings, Blair Middle school, SEC of South Marengo Avenue and Allendale Road, Pasadena, California, report prepared by Geotechnical Professionals Inc., dated March 31, 2009.
15. Response to Engineering Geology and Seismology Review, Blair IB Magnet School, 1200 South Marengo Avenue, Pasadena, California, prepared by Geotechnical Professionals, Inc., dated November 23, 2009.
16. Eagle Rock-San Rafael Fault, report prepared by Schell Geological Consulting CO, dated November 19, 2009.
17. Earthquake Hazards Associated with the Verdugo-Eagle Rock and Benedict Canyon Fault Zones, Los Angeles County, California, DMG open file report 80-10.
18. Preliminary Engineering Geology Investigation of the La Loma Bridge Site, City of Pasadena, California. Prepared by Wilson Geosciences Inc. Altadena, California 91001-2117, dated November 2004.
19. Quaternary Geology and Seismic Hazard of the Sierra Madre and Associated Faults, Western San Gabriel Mountains, California by R. Crook, Jr. et al., dated December 1978.
20. USGS Professional Paper 1339.
21. California Division of Mines & Geology, Geology of Southern Half of the Azusa Quadrangle, D.M. Morton 1973.
22. Blake, T.F., 2002, EQSEARCH, Computer Program for Estimation Prediction of Peak Horizontal Acceleration from California Earthquake Catalogs, Unpublished Private Programs, Fault and Earthquake data base updated 1999.
23. EZ-FRISK 7.31 Build 005, Risk Engineering, Inc.
24. Minimum Design Loads for Buildings and Other Structures, ASCE Standard 7-10.

25. Boore, D.M. and Atkinson, G.M. (2007), Boore-Atkinson NGA Ground Motion Relations for the Geometric Mean Horizontal Component of Peak and Spectral Ground Motion Parameters, PEER 2007/01, Pacific Earthquake Engineering Research Center, Berkeley, California.
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31. Jennings, C.W., (1994), The Fault Activity Map of California: Cal. Div. Of Mines and Geol., Data Map Series No. 6.
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34. Cao, T., Bryant, W.A., Rowshandel, B.R., Branum, D. and Wills, C.J., The Revised 2002 California Probabilistic Seismic Hazard Maps, June 2003, California Geological Survey.
35. Idriss, I.M. (2008), An NGA Empirical Model for Estimating the Horizontal Spectral Values Generated By Shallow Crustal Earthquakes, Earthquake Spectra, Volume 24, No. 1, February 2008, pages 217-242.
36. US Department of Defense, Soil Dynamics and Special Design Aspects, MIL-HDBK-1007/3 dated November 15, 1997
37. Response to Engineering Geology and Seismology Review, Blair 1B Magnet School, 1200 South Marengo Avenue, Pasadena, California, Report by GPI Project No. 2265.G, dated November 23, 2009.

38. Response to CGS Review, Blair 1B Magnet School-New Class Room and Modernization, 1201 South Marengo Avenue, Pasadena, California, Report by GPI Project No. 2316.1, dated January 12, 2011.
39. Dynamic Shear Modulus & Material Damping by Jonathan D. Bray, Ph.D., P.E.
40. Guidelines for Evaluating and Mitigating Seismic Hazards in California, California Department of Conservation, Division of Mines and Geology, Special Publication 117, adopted March 13, 1997.
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42. Jennings, C. W., Fault Activity Map of California and Adjacent Areas ... with Locations and Ages of Recent Volcanic Eruptions, California Geological Survey, formerly California Division of Mines and Geology, Data Map No. 67, 1994).
43. Abrahamson, N. A. and Silva, W.J. (2008), Abrahamson & Silva NGA Ground Motion Relations For The Geometric Mean Horizontal Component Of Peak And Spectral Ground Motion Parameters, Final Report prepared for the Pacific Earthquake Engineering Research Center, February 2008.
44. Significant Changes to the Seismic Load Provisions of ASCE 7-10 An Illustrated Guide by S. K. Ghosh, Susan Dowty, Prabuddha Dasgupta, 2011.
45. Site Amplifications for Generic Rock Sites by David M. Boore and William B. Joyner. Bulletin of the Seismological Society of America, Vol. 87, No. 2, pp 327-341, April 1997.
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47. Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations, Caltrans, Division of Engineering Services, Geotechnical Services, November 2012.
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53. Blake, T. F., UBCSEIS, A Computer Program for the Estimation of Uniform Building Code Coefficients Using 3-0 Fault Sources, 1998.
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55. Brain S. J. Chiou and Robert R. Youngs, A NGA Model for the Average Horizontal Component of Peak Ground Motion and Response Spectra, preprint for article to be published in NGA Special Edition for Earthquake Spectra, Spring 2008.
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57. California Department of Conservation, California Geologic Survey (formerly California Division of Mines and Geology), Probabilistic Seismic Hazard Assessment for the State of California, Open File Report 96-08, 1996.
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1.0 INTRODUCTION

This addendum to our original geotechnical report is prepared to update our previous Ground Motion Analysis based on current California Building Code "CBC" 2013, for the proposed Glenarm Repowering Project (GT-5 Combined Cycle Installation) location, at the southeast corner of the intersection of South Fair Oaks Avenue and Glenarm Street in the

City of Pasadena, California (hereinafter referred to as "Site"). Site investigation was performed from June 8, 2011 through August 2011 in conformance with the Pasadena Water & Power, Glenarm Repowering Project, GT-5 Combined Cycle Installation, Geotechnical Requirements, prepared by Power Engineers, dated May 3, 2011, and consisted of field exploration, laboratory testing, engineering analysis of the field and laboratory data, and preparation of this report.

2.0 GEOLOGIC HAZARDS

2.1 Regional Faulting and Seismicity

To evaluate regional faulting for the Site we reviewed published and unpublished geologic maps and performed a deterministic analysis to establish known active fault locations and estimated peak ground accelerations for the Site.

Regional geologic information for geology and seismology reports for California are presented on Figures 6 through 16 of our original report. Figure 6 shows the regional geologic map for the Site. Figure 7 Fault Exposure along Eagle Rock Fault. Figure 15 is a seismic Hazard Zone map.

2.2 Local Faulting

Tectonic processes (faulting and earthquakes) are very active in the Site region. Figures 6, 7, 12 and 13 of our original report show the Site location relative to the known active and potentially active faults. Obviously, the closer a site is to an active fault, the greater potential there is for surface rupture and high earthquake ground motions. The Site does not lie close to any known active fault capable of surface fault rupture. However, the queried and buried trace of the San Rafael Fault is shown to cross the northeastern corner of Jacob Parking Lot (Figure 14 of our original report). It should be noted that, on Figure 6 of our original report, the fault is shown to cross through the Pasadena Power Plant entering from the west and exiting from southeast corner along the Alhambra Wash.

The faults that trend mostly to the east-west are those associated with the Transverse Ranges. They produce mostly reverse (thrust) movement along north dipping planes which trend along southerly facing upland flanks. The active thrusts in the region include the Sierra Madre, Cucamonga, Raymond, and Santa Monica-Hollywood Faults. Another type of thrust fault is a blind thrust, these faults also are associated with the same process that elevated the Transverse Ranges, but the fault has remained buried and undetectable unless it produces an earthquake. The Raymond Fault, projecting along the south side of the Raymond Basin, at one time, may have been a blind thrust but because of continued activity it ruptured the ground surface.

2.3 Seismic Hazard Analysis

According to the computer program EZ-FRISK (Version 7.62) there are 6 known active faults located within a search radius of 50 miles from the property. We used the 2008 USGS fault database, which provides several models and combinations of fault data to evaluate fault information. The nearest active fault is the Verdugo-Eagle Rock Fault, located approximately 0.68 Km north of the Site and is the dominant source of seismic ground motion. Earthquakes that might occur on the Verdugo-Eagle Rock Fault or other faults within southern California are potential generators of significant ground motion at the Site. The estimated maximum earthquake magnitude and peak ground acceleration for the Verdugo-Eagle Rock Fault are 6.9 and 1.122g, respectively. Table 2.3.1 lists the estimated maximum earthquake magnitude and peak ground acceleration for the most dominant faults in relationship to the Site location. We calculated peak ground acceleration (PGA) using Boore-Atkinson Project No. G1589-42-03 - 3 - January 17, 2014 (2008) NGA USGS 2008, Campbell-Bozorgnia (2008) NGA USGS 2008, and Chiou-Youngs (2008) NGA acceleration-attenuation relationships.

TABLE 2.3.1
DETERMINISTIC SEISMIC SITE PARAMETERS

Fault Name	Distance from Site (Km)	Maximum Earthquake Magnitude (Mw)	Peak Ground Acceleration		
			Boore-Atkinson, (2008) NGA USGS 2008 (g)	Campbell-Bozorgnia, (2008) NGA USGS 2008(g)	Chiou-Youngs, (2008) NGA (g)
Verdugo&Eagle Rock Fault	0.68	6.9	0.869	0.8253	1.122
Raymond	0.83	6.5	0.8468	0.8972	1.213
Upper Elysian Park	7.41	6.4	0.8242	0.7611	1.017
Hollywood	7.5	6.4	0.5023	0.5230	0.6090
Sierra Madre	8.44	7.2	0.5855	0.5321	0.7398
Puente Hills Blind Thrust	10.68	7.10	0.8964	0.7110	1.049

We used the computer program EZ-FRISK to perform a probabilistic seismic hazard analysis. The computer program EZ-FRISK operates under the assumption that the occurrence rate of earthquakes on each mapped Quaternary fault is proportional to the slip rate. The program accounts for earthquake magnitude as a function of fault rupture length, and site acceleration estimates are made using the earthquake magnitude and distance from the site to the rupture zone. The program also accounts for uncertainty in each of following: (1) earthquake magnitude, (2) rupture length for a given magnitude, (3) location of the rupture zone, (4) maximum possible magnitude of a given earthquake, and (5) acceleration at the Site from a given earthquake along each fault. By calculating the expected accelerations from considered earthquake sources, the program calculates the total average

annual expected number of occurrences of site acceleration greater than a specified value. We utilized acceleration-attenuation relationships suggested by Boore-Atkinson (2008) NGA USGS 2008, Campbell-Bozorgnia (2008) NGA USGS 2008, and Chiou-Youngs (2008) NGA in the analysis. Table 2.3.2 presents the Site-specific probabilistic seismic hazard parameters including acceleration-attenuation relationships and the probability of exceeding.

TABLE 2.3.2
PROBABILISTIC SEISMIC HAZARD PARAMETERS

Probability of Exceeding	Peak Ground Acceleration		
	Boore-Atkinson, (2008) NGA USGS 2008 (g)	Campbell-Bozorgnia, (2008) NGA USGS 2008(g)	Chiou-Youngs, (2008) NGA (g)
2% in a 50 Year Period	1.064	0.9634	1.198
5% in a 50 Year Period	0.8239	0.7465	0.9526
10% in a 50 Year Period	0.6590	0.5820	0.7312

The California Geologic Survey (CGS) has a program that calculates the ground motion for a 10 percent probability of exceeding in a 50-year period based on an average of several attenuation relationships. Table 2.3.3 presents the calculated results from the Probabilistic Seismic Hazards Mapping Ground Motion Page from the CGS website.

TABLE 2.3.3
PROBABILISTIC SITE PARAMETERS FOR SELECTED FAULTS
CALIFORNIA GEOLOGIC SURVEY

Calculated Acceleration (g) Formational soil	Calculated Acceleration (g) Fill
0.625	0.625

While listing peak ground accelerations is useful for comparison of potential effects of fault activity in a region, other considerations are important in seismic design, including frequency and duration of motion and soil conditions underlying the Site. Seismic design of the structures should be evaluated in accordance with the most current adopted guidelines of the California Building Code (CBC).

2.4 Liquefaction

Liquefaction typically occurs when: a site is located in a zone with seismic activity; The subject Site is not within a "Liquefaction Hazard Zone", as delineated by the State of California, in compliance with Chapter 7.8, Division 2 of the California Public Resources Code (Seismic Hazards Mapping Act). No groundwater was encountered at the Site to the maximum depth of 60 feet below ground surface explored.

Due to the lack of a permanent near-surface groundwater table and the dense nature of the underlying soil, the risk associated with liquefaction hazard at the Site is none.

2.5 Subsidence and Seismic Settlement

Based on the subsurface conditions encountered during our field investigation, the risk associated with ground subsidence or seismic settlement hazard is low.

2.6 Ground Rupture

The risk associated with ground rupture hazard within the Site is low due to the absence of active faults within or adjacent to the Site.

3.0 SEISMIC DESIGN CRITERIA

The following table summarizes site-specific design criteria obtained from the 2013 California Building Code (CBC; based on the 2012 International Building Code [IBC]) and ASCE 7-10. The data was calculated using the U.S. Seismic Design Maps web application provided by the USGS. The short spectral response uses a period of 0.2 second. We evaluated the Site Class based on the discussion in Section 1613 A.3.2 of the 2013 CBC and Table 20.3-1 of ASCE 7-10. The values presented below are for the risk-targeted maximum considered earthquake (MCER).

TABLE 3.1.1
2013 CBC SEISMIC DESIGN PARAMETERS

Parameter	Value	2013 CBC Reference
Site Class	D	Section 1613A.3.2
MCER Ground Motion Spectral Response Acceleration - Class B (short), Ss	2.821g	Figure 1613A.3.1(1)
MCER Ground Motion Spectral Response Acceleration - Class B (I sec), S1	0.981g	Figure 1613A.3.I(2)
Site Coefficient, FA	1.0	Tablel613A.3.3(l)
Site Coefficient, Fv	1.5	Table 1613A.3.3(2)
Site Class Modified MCER Spectral Response Acceleration (short), SMs	2.821g	Section I613A.3.3 (Eqn 16-37)
Site Class Modified MCER Spectral Response Acceleration - (1 sec), SM1	1.481g	Section 1613A.3.3 (Eqn 16-38)
5% Damped Design Spectral Response Acceleration (short), SDS	1.880g	Section 161A3.3.4 (Eqn 16-39)
5% Damped Design Spectral Response Acceleration (1 sec), SD1	0.987g	Section 1613A.3.4 (Eqn 16-40)

Table 3.2.1 presents the mapped maximum considered geometric mean (MCEG) seismic design parameters for projects located in Seismic Design Categories of D through F in accordance with ASCE 7-10.

TABLE 3.2.1
ASCE 7-10 PEAK GROUND ACCELERATION

Parameter	Value	ASCE 7-10 Reference
Mapped MCEG Peak Ground Acceleration	1.083	Figure 22
Site Coefficient	1.0	Table 11.8
Site Class Modified MCEG Peak Ground Acceleration	1.083 g	Section 11.8.3 (Eqn 11.8

Conformance to the criteria in the above tables for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a large earthquake occurs. The primary goal of seismic design is to protect life, not to avoid damages, since such design may be economically prohibitive.

3.1 Site-Specific Ground Motion Hazard Analysis

3.2.1 In accordance with ASCE 7-10 and Section 1613A of the 2013 CBC, ground motion hazard analyses were performed utilizing the computer program EZ-FRISK (version 7.62) in conjunction with data from the U.S. Seismic Design Maps web application provided by the USGS.

3.2 Probabilistic Seismic Hazard Analysis

The probabilistic Maximum Considered Earthquake (MCER) response spectrum consists of the spectral response accelerations which are expected to achieve a 1 percent probability of collapse within a 50-year period, evaluated at 5-percent damping. The procedure described in ASCE 7-10 Section 21.2.1.1 Method 1 was used to evaluate the probabilistic response spectrum.

The spectral response accelerations having a 2 percent chance of exceeding in 50 years was evaluated at 5 percent damping. The probabilistic analysis was performed using the attenuation relationships of Abrahamson and Silva (2008) NGA MCR (next generation attenuations, maximum rotated component), Boore and Atkinson (2008) NGA USGS 2008 MRC, and Campbell-Bozorgnia (2008) NGA USGS 2008 MRC. Each attenuation relationship was assigned an equal weight and the maximum rotated component of ground motion derived from the relationships was evaluated.

The probabilistic analysis was performed by evaluating the spectral response accelerations generated by known active faults within a 60 mile (100 kilometer) radius of the Site. The soil underlying the Site was modeled as a Site Class D with a corresponding average shear wave velocity (Vs30) of 300 meters per second.

The attenuation relationships of Abrahamson and Silva NGA require that the depth to where the shear wave velocity reaches 1 km/sec (Z1.0) be defined. The attenuation relationship of Campbell and Bozorgnia requires that the depth to where the shear wave velocity reaches 2.5 kilometers per second (Z2.5) be defined. The values of Z 1.0 and Z2.5 were estimated based on the attenuation equation basin model and based on the value of Vs30.

According to ASCE 7-10 Section 21.2.1.1 Method 1, the probabilistic MCER spectral response accelerations may be determined as the product of the spectral response accelerations having a 2 percent chance of exceeding in 50 years and the risk coefficient Cr. The value of Cr at 0.2 seconds (CRS) and 1 second (CR1) were determined from ASCE 7-10 Figures 22-17 and 22-18. At spectral response accelerations less than or equal to 0.2 seconds, the value of Cr was taken as Crs and at spectral response accelerations greater than or equal to 1.0 seconds the value of CR was taken as CR1. Linear interpolation was used to evaluate the values of CR between 0.2 and 1.0 seconds.

3.3 Deterministic Seismic Hazard Analysis

The deterministic analysis was performed using the same NGA's as the probabilistic analysis, as well as the same active faults within a 60 mile (100 kilometer) radius of the Site and the same values of Z1.0 and Z2.5. The 84th percentile of the maximum rotated component of ground motion derived from the attenuation relationships was evaluated. The effects of near source directivity were also considered in the analysis (Somerville 1997, Abrahamson 2000).

Based on the results of the analysis, the active fault resulting in the highest spectral accelerations would be a magnitude 6.9 event on the Verdugo-Eagle Rock Fault. The 84th percentile of the maximum rotated component of ground motion was compared to the Deterministic Lower Limit MCER response spectrum, and the maximum values taken as the deterministic MCER response spectrum.

3.4 Site-Specific Response Spectrum

The lesser of the probabilistic and deterministic MCER response spectrums is the Site Specific MCER. Two-thirds of the Site-Specific MCER is the Design Response Spectrum, provided the results are not less than 80 percent of the General Design Response Spectrum determined by ASCE 7-10 Section 11.4.5.

Graphical representations of the analyses are presented on the attached Figures. The final Site-Specific Design Response Spectrum is also attached as figure 2. The results of the analysis are presented in tabular form in Table 3.4.1.

Table 3.4.1 (Class D, VS30 300ft/sec)

Period	1	2	3	4	5	6	7	8	9
	Design Response Spectrum With Section 11.4.5 (g)	Generalized MCE Response Spectrum Section 11.4.6 (g)	Probabilistic MCER (2% in 50 years) 21.2.1 (g)	Deterministic MCER (84th percentile) 21.2.3 (g)	Deterministic Lower Limit MCER ASCE 21.2.2 (Figure 21.2-1) (g)	Site-Specific MCE Response Spectrum ASCE 21.2.3 (g)	Site-Specific Design Response spectrum (2/3 Site Specific MCE Response Spectrum (of 21.2.3) ASCE 21.3 (g)	80% of Design Response Spectrum (of 11.4.5) ASCE 21.3 (g)	final Design Response Spectrum ASCE 21.3 (g)
0.03	1.074	1.611	1.23032	1.17214	0.669453	1.17214	0.781	0.859	0.859
0.05	1.289	1.934	1.46708	1.34123	0.801383	1.34123	0.894	1.031	1.031
0.1	1.826	2.739	2.04288	1.75864	1.13039	1.75864	1.172	1.461	1.461
0.105	1.880	2.820	2.07982	1.79711	1.15481	1.79711	1.198	1.504	1.504
0.12	1.880	2.820	2.18671	1.90831	1.500	1.90831	1.272	1.504	1.504
0.2	1.880	2.820	2.54591	2.32012	1.500	2.32012	1.547	1.504	1.547
0.3	1.880	2.820	2.65351	2.55302	1.500	2.55302	1.702	1.504	1.702
0.4	1.880	2.820	2.67396	2.62982	1.500	2.62982	1.753	1.504	1.753
0.5	1.880	2.820	2.62697	2.57244	1.500	2.57244	1.715	1.504	1.715
0.525	1.880	2.820	2.58194	2.53146	1.500	2.53146	1.688	1.504	1.688
0.6	1.645	2.468	2.4627	2.42211	1.500	2.42211	1.615	1.316	1.615
0.7	1.410	2.115	2.28166	2.22255	1.286	2.22255	1.482	1.128	1.482
0.75	1.316	1.974	2.20555	2.13358	1.200	2.13358	1.422	1.053	1.422
0.8	1.234	1.851	2.12257	2.03128	1.125	2.03128	1.354	0.987	1.354
0.9	1.097	1.645	1.9771	1.92203	1.000	1.92203	1.281	0.877	1.281
1	0.987	1.481	1.8276	1.85902	0.900	1.8276	1.218	0.790	1.218
2	0.494	0.740	0.909983	1.00404	0.450	0.909983	0.607	0.395	0.607
3	0.329	0.494	0.563014	0.621137	0.300	0.563014	0.375	0.263	0.375
4	0.247	0.370	0.410131	0.463672	0.225	0.410131	0.273	0.197	0.273

The results of the site-specific seismic analysis are summarized graphically in Figures 1 and 2.

According to Table 3.4.1, S_{DS}=1.577g, S_{D1}=1.218g and based on Table 11.6.-1 in ASCE 7-10, the seismic design category is D.

3.5 Site Modified Seismic Design Criteria

Based the site-specific ground motion hazard analysis performed, and in accordance with the ASCE 7-10 Section 21.4, site-specific seismic design parameters may be derived using the results of the site-specific ground motion hazard analysis.

The parameter SDS shall be obtained from the site-specific spectra at a period of 0.2 second and not less than 90 percent of the peak spectra acceleration at any period larger than 0.2 second. The parameter SM shall be taken as the greater of the site-specific spectral acceleration at a period of 1.0 second or twice the spectral acceleration at a period of 2 seconds (whichever is greater). The values of SMs and SM1 shall be taken as 1.5 times the site-specific values of SDs and SD1.The site-specific seismic design parameters shall not be less than 80 percent of the general seismic design values determined by ASCE 7-10 Section 11.4.

Table 3.5.1 presents the site-specific seismic design parameters based on the site-specific ground motion hazard analysis.

TABLE 3.5.1
SITE MODIFIED SEISMIC DESIGN PARAMETERS

Parameter	Value
Maximum Considered Earthquake Spectral Response Acceleration (short), SMS	2.367g
Maximum Considered Earthquake Spectral Response Acceleration - (1 sec), SM1	1.827g
5% Damped Design Spectral Response Acceleration (short), SDS	1.577g
5% Damped Design Spectral Response Acceleration (1 sec), SD1	1.218g

3.6 Site-Specific Peak Ground Acceleration

The site-specific Maximum Considered Earthquake (MCEG) geometric mean peak ground acceleration was evaluated in accordance with ASCE 7-10 Section 21.5.

The probabilistic geometric mean peak ground acceleration was evaluated using the computer program EZ-Frisk. The analyses were performed using the attenuation relationships of Abrahamson and Silva (2008) NGA (next generation attenuations), Boore and Atkinson (2008) NGA USGS 2008, and Campbell-Bozorgnia (2008) NGA USGS 2008. Each attenuation relationship was assigned an equal weight. The analysis used the same faults, Site Class, and values of Zl .0 and Z2.5 as the MCER analysis.

The probabilistic geometric mean peak ground acceleration (probabilistic MCEG) was evaluated at a 2 percent probability of exceeding within a 50 year period.

The deterministic geometric mean peak ground acceleration (deterministic MCEG) was evaluated as the 84th percentile geometric mean peak ground acceleration. The

deterministic MCEG shall not be less 0.5FPGA, where FPGA is determined from ASCE 7-10 Table 11.8-1 with the value of PGA taken as 0.5g.

The site-specific MCEG peak ground acceleration is taken as the lesser of the probabilistic and deterministic MCEG, provided the value is not less than 80 percent of the value of PGAM as determined by ASCE 7-10 Equation 11.8.1.

TABLE 3.6.1
ASCE 7-10 SITE SPECIFIC PEAK GROUND ACCELERATION

Parameter	Value	ASCE 7-10 Reference
Site-Specific MCEG Peak Ground Acceleration, PGAM	0.8664	Section 21.5

The Building Code set the minimum values (Table 3.1.1) and geotechnical engineer or other authorities can not recommend values less than those required by Building Code. The site-specific calculation was made according to the City of Pasadena requirement and City of Pasadena Power Plant request to make sure that site-specific calculations does not exceed current building code minimum requirements. Geotechnical Engineer can recommend seismic values exceeding building code but they can not recommend seismic value less than those required by current building code. It is a customary design practice to base the calculations on the more conservative parameters especially for critical structures.

This report has been prepared for the exclusive use of the City of Pasadena Power Plant, their design consultants and for the specific project discussed herein. Since the report has not been prepared for use by other parties, it may not contain sufficient information for other parties or other uses. Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by geotechnical consultants practicing in this or similar localities.

The recommendations provided in this report are based upon our understanding of the described project information and on our interpretation of the data collected during the subsurface explorations and laboratory testing. The recommendations and opinions expressed in this report reflect our best estimate of project requirements based on information obtained at exploratory borings, and sampling locations on the date indicated. It must be recognized, however, that evaluation of subsurface deposits, such as those present at the Site, are subject to the influence of undisclosed and unforeseen variations in soil conditions that may occur at different times and intermediate, unexplored areas. This report has been prepared in accordance with generally accepted soils engineering practices. No other warranties, either expressed or implied, are made as to the professional advice provided under the terms of our contract and included in this report.

The recommendations provided in this report are also based upon the assumption that the necessary geotechnical observations and testing during construction will be performed by a qualified geotechnical engineer. The field observation services are considered a continuation of the geotechnical investigation and essential to verify that the actual soil conditions are as

anticipated. This also provides for the procedure whereby the client can be advised of unanticipated or changed conditions that would require modifications of our original recommendations. In addition, the presence of a qualified geotechnical engineer at the Site will provides the client with an independent professional opinion regarding the geotechnical-related construction procedures.

This opportunity to be of service is sincerely appreciated. If you have any questions concerning this report, please do not hesitate to contact this office.

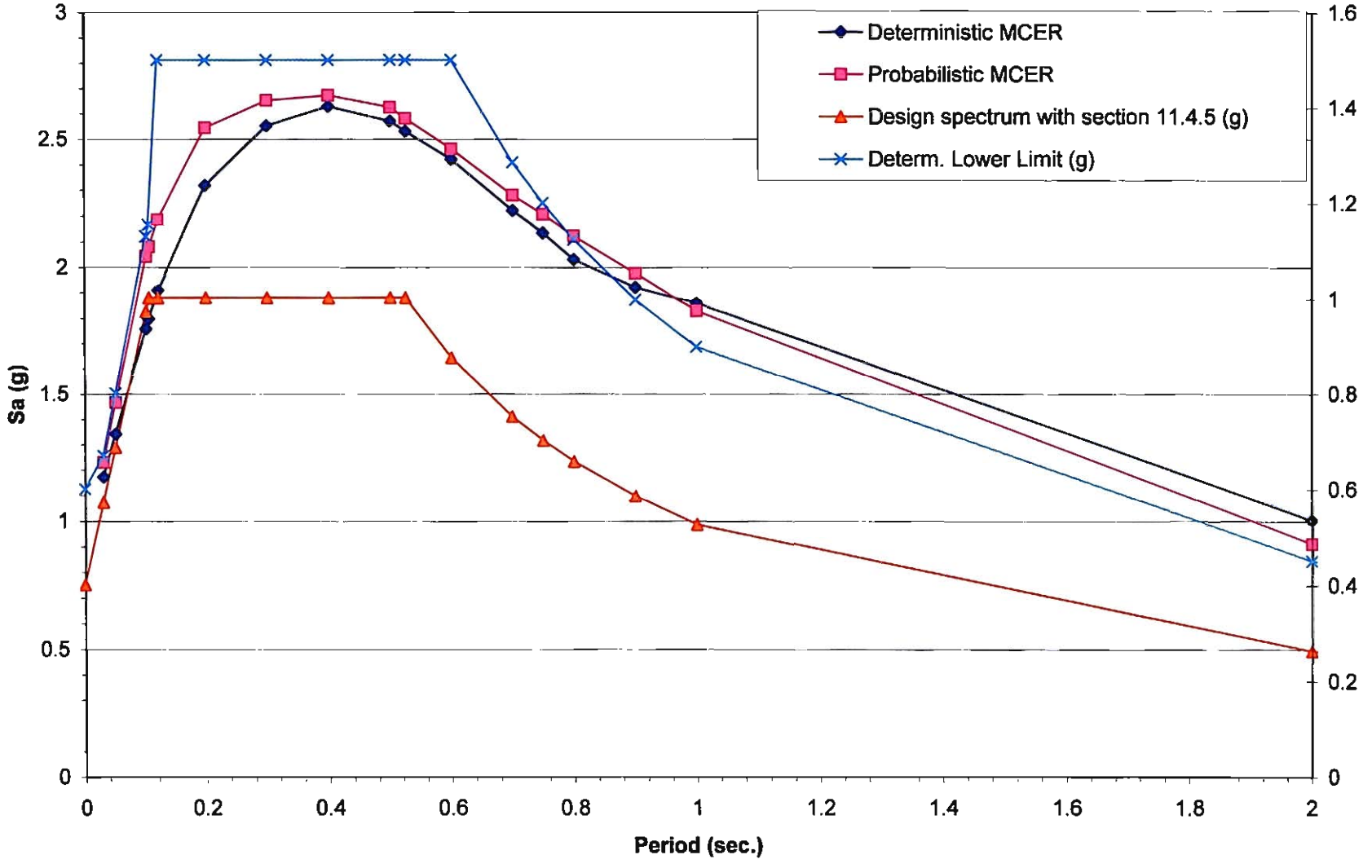
Very Truly Yours,
HYDROLOGUE, INC.

Seyed Morteza Mortazavi, Ph.D.
R.G.E. 2216
G.E.G. 1724

Enclosures: Figure 1 Probabilistic & Deterministic MCE and Lower Limit
Figure 2 Final Design Spectrum According to Table 3.4.1

Z:\REPORTS\Phase2\3626-00 Pasadena Power Plant PPP\Seismic Calc\PPP seismic calc rpt.doc

Probabilistic & Deterministic MCE and Lower Limit

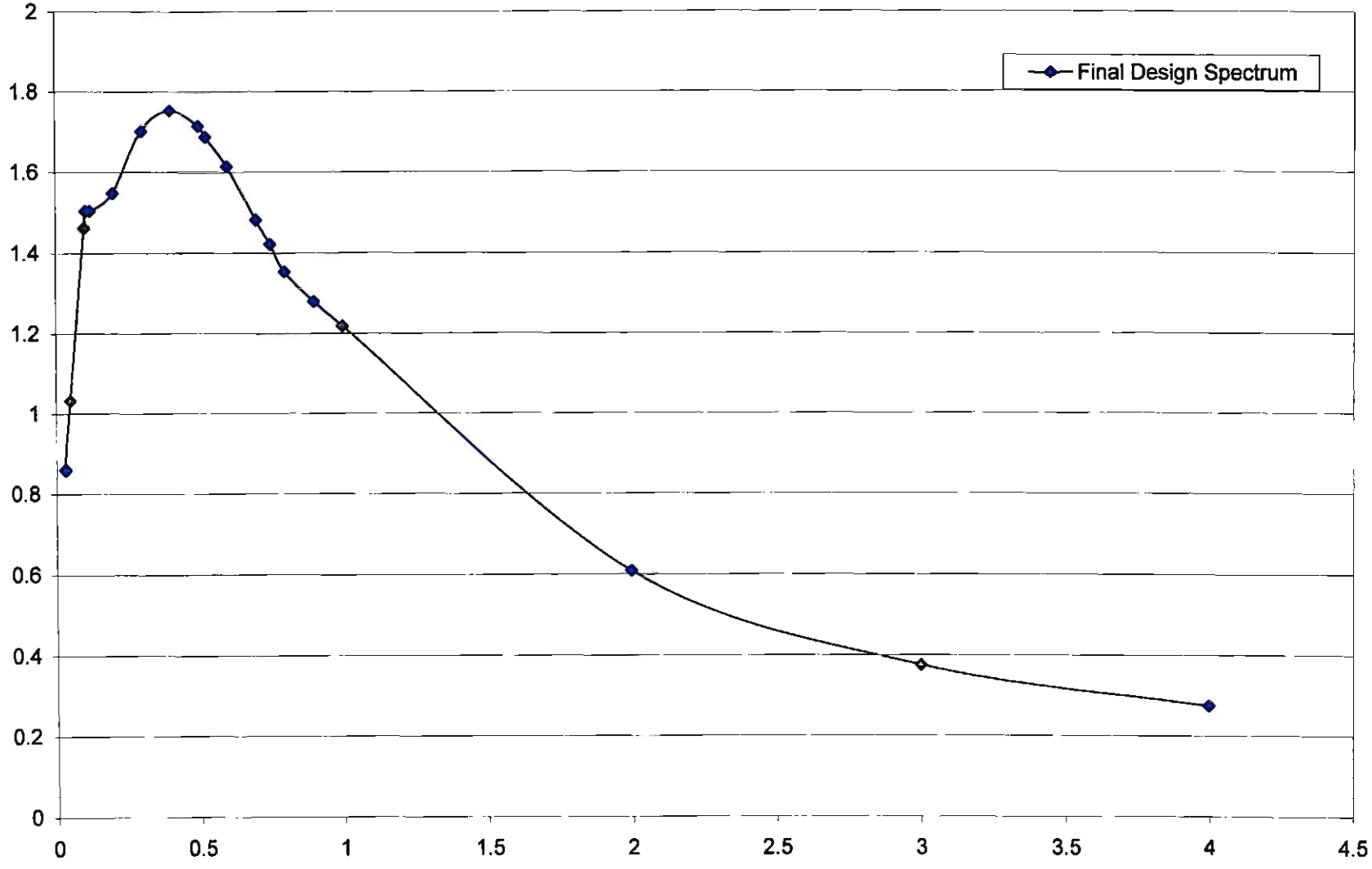


Pasadena Power Plant

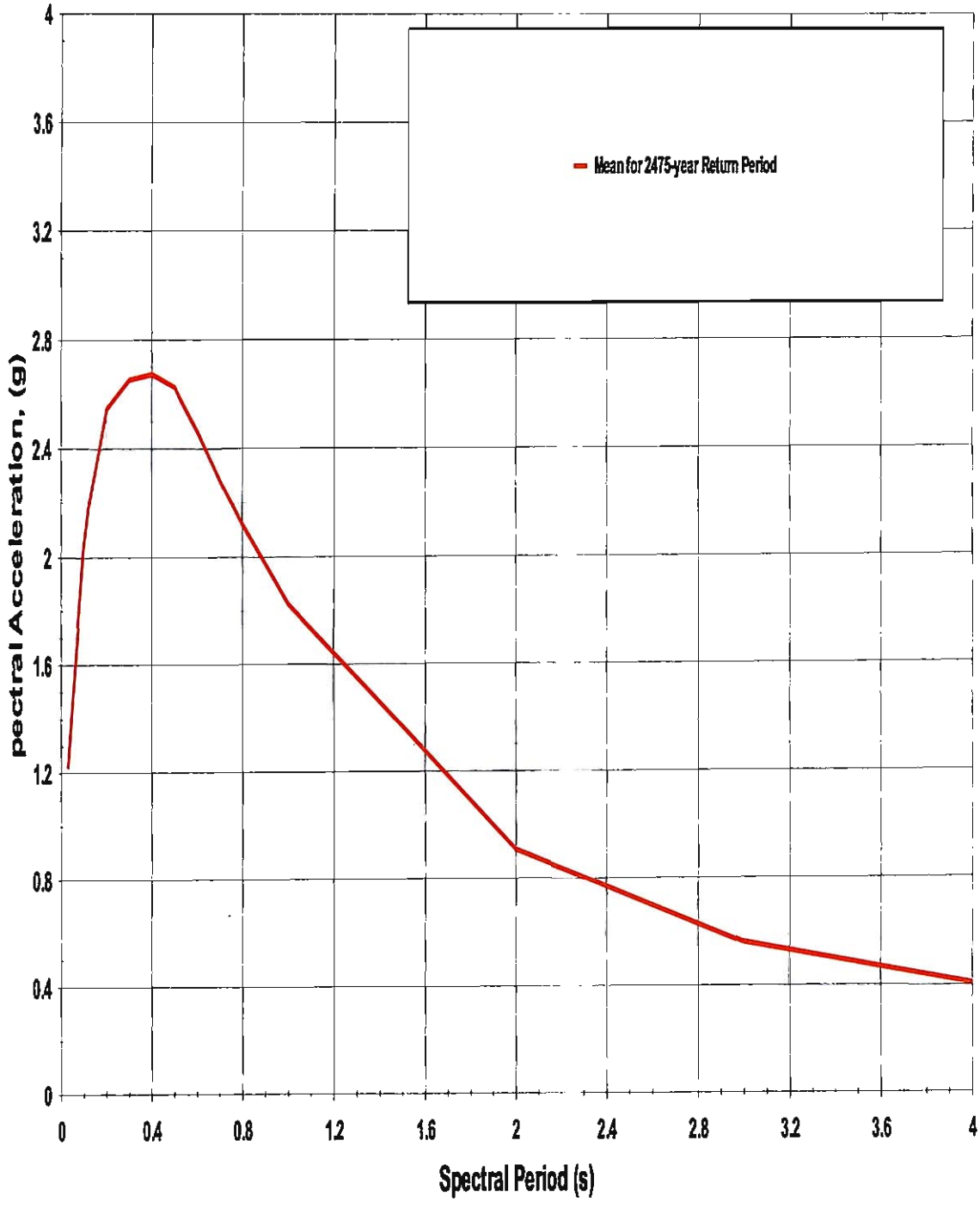
SE Corner of Fair Oaks Ave and Glenarm St, Pasadena, CA

Figure 1

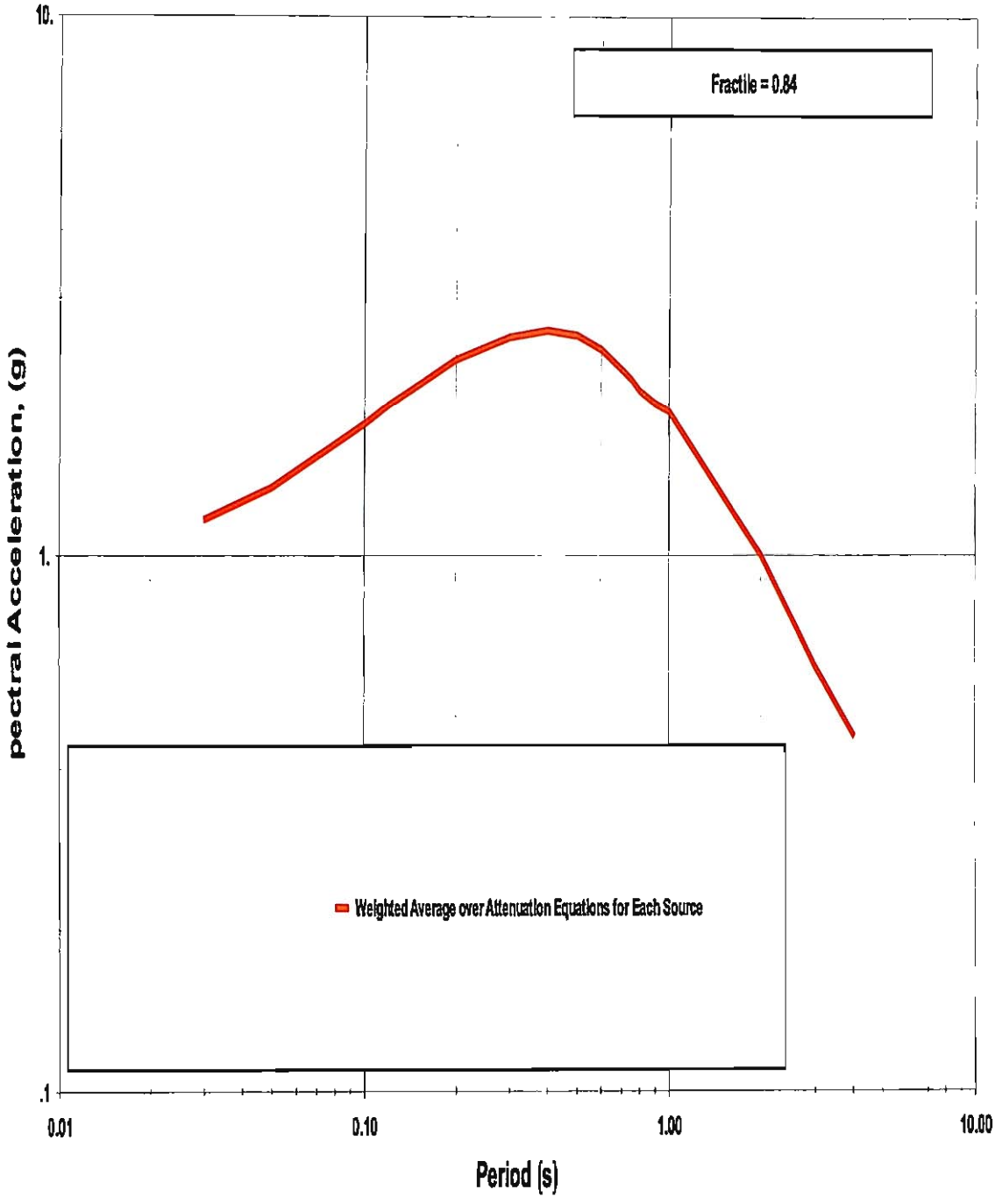
Final Design Spectrum

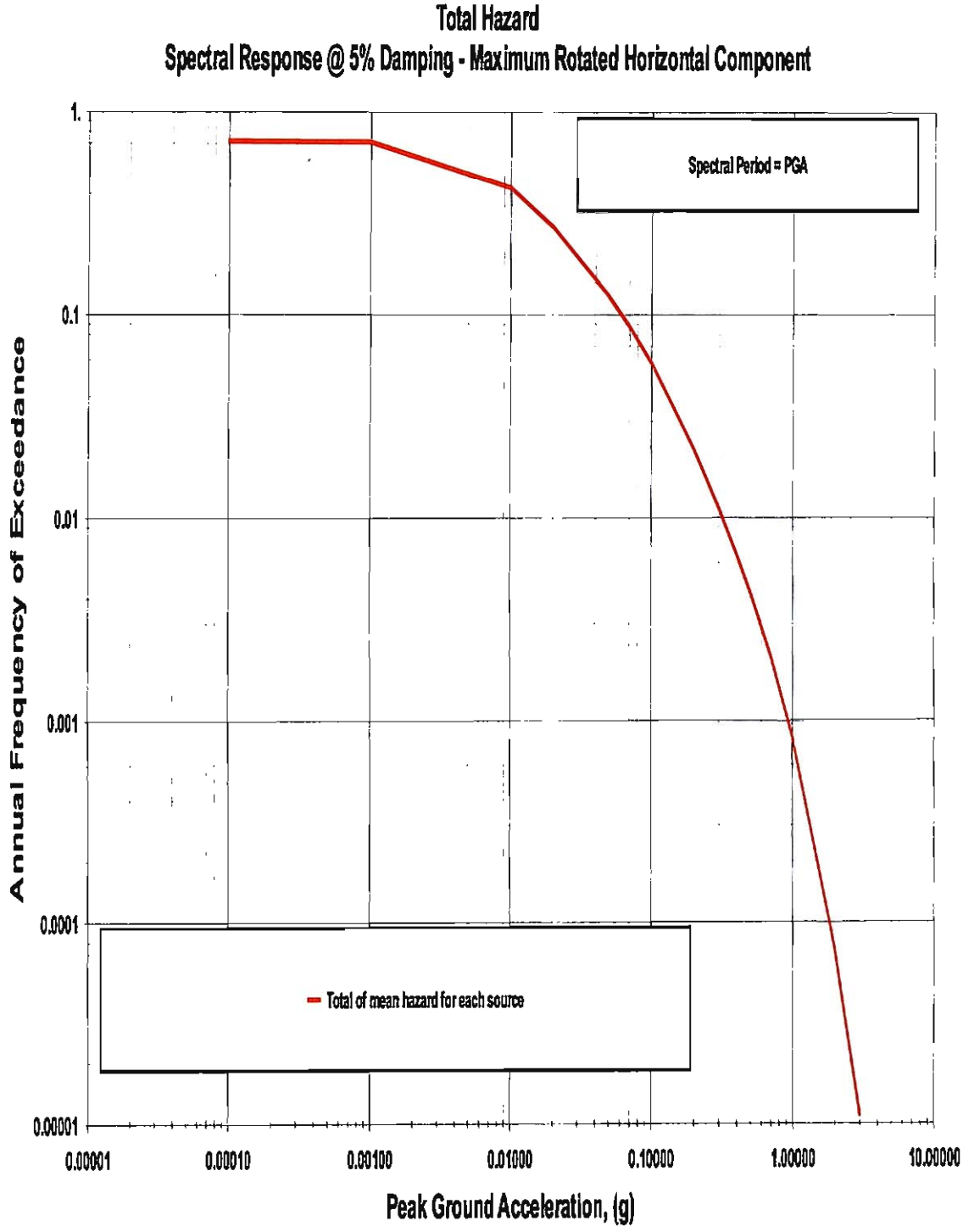


Uniform Hazard Spectra
Spectral Response @ 5% Damping - Maximum Rotated Horizontal Component



Deterministic Spectra
Spectral Response @ 5% Damping - Maximum Rotated Horizontal Component




Total Hazard
Spectral Response @ 5% Damping - Maximum Rotated Horizontal Component
Spectral Period = PGA
Total of mean hazard for each source
Annual Frequency of Exceedance
1.
0.1
0.01
0.001
0.0001
0.00001
0.00001
0.00010
0.00100
0.01000
0.10000
1.00000
10.00000
Peak Ground Acceleration, (g)

Enclosure 6

July 26, 2013

PASADENA WATER & POWER

GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE *INSTALLATION)*

Section 485325.11
Ammonia Forwarding Pump Skid

PROJECT NUMBER:
123374

PROJECT CONTACT:
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Section 4855325.11
Ammonia Forwarding Pump Skid

Prepared for: *PASADENA WATER & POWER*
Prepared by: *TONY CLARK*

REVISION HISTORY		
DATE	REVISED BY	REVISION
7/26/13	T. Clark	A

SECTION 485325.11
AMMONIA FORWARDING PUMP SKID

TABLE OF CONTENTS

SECTION 485325.11
AMMONIA FORWARDING PUMP SKID

PART 1 - GENERAL

1.1 SUMMARY

A. This section details the minimum technical requirements for the design, manufacture, testing, and furnishing of an ammonia transfer pump skid. It is not the intent to specify completely herein all details of design and construction of the transfer pump skid. However, the equipment shall conform in all respects to high standards of engineering, design and workmanship and be capable of performing in continuous commercial operation up to the BOP Contractor's guarantee in a manner acceptable to the General Manager.

B. The BOP Contractor shall have single source responsibility for all equipment furnished under this specification. No departure shall be made from this specification and the referenced standards and codes unless specific requirements are waived or amended in writing by the General Manager.

C. In the event of a perceived conflict between referenced standards, codes and the documents included in this specification, or an apparent conflict with the technical requirements of the specification and the BOP Contractor's ability to meet the performance requirements contained herein, the BOP Contractor shall refer the conflict in writing to the General Manager for resolution.

1.2 FURNISHED BY BOP CONTRACTOR

A. The following equipment, materials and services shall be provided by the BOP Contractor for each pump and driver set:

1. Base frame mounted pump with close coupled electric motor driver and variable speed drive selected to perform as required for the pump datasheet attached to this Section.
2. All piping, accessories, and necessary instrumentation between the inlet and outlet tie points of the ammonia transfer skid assembled prior to shipment to the site
3. All seals, bearing lubrication systems, couplings, coupling guards, drivers, baseplates/support systems and other standard accessories or as specified herein.
4. Cleaning and finishing prior to shipment
5. Painting
6. Startup spares and special tools
7. If required for the project, performance testing at factory and certificates of results
8. Drawings and design data to support facility design, construction and maintenance
9. Inspection certificates and quality control documentation listed in this Section
10. Complete set of component cut sheets
11. Operating, commissioning, installation and maintenance manuals for the supplied equipment.
12. Priced list of recommended spare parts for two years of operation
13. Packing and shipping to the Glenarm Plant or a location to be identified by the General Manager either in the city of Pasadena, CA or other nearby city.
14. Sun shade cover or awning over the skid
15. Foundation and anchor bolts

16. Piping external to pump skids
17. Motor starters and power wiring
18. Receipt and off-loading at site
19. Installation at site, material lay-down area defined by the General Manager
20. Skid mounted Control System, with control system hardware, configuration Local HMI programming completed and tested.
21. Electrical, instrumentation and controls wiring
22. Field inspection and testing

1.3 RELATED SECTIONS

A. Section 260000, Electrical - Mechanical Equipment

B. Section 262050, Specification for Low Voltage Motors

C. Section 480020, Site Conditions

D. Section 480031, Combined Cycle Power Island Noise Control Performance

E. Section 481200, Combined Cycle Balance of Plant

1.4 CODES AND STANDARDS

A. Refer to 481200 Combined Cycle Balance of Plant for general codes and standards applicable to the project. The following codes and standards apply to the specific equipment supplied under this Section.

1. Antifriction Bearing Manufacturer's Association (ABMA)
2. American National Standards Institute (ANSI)
   a. ANSI/HI 3.6 Rotary Pump Tests - A110
   b. ANSI/HI 4.1-4.6 Sealless, Magnetically Driven Rotary Pumps for Nomenclature, Definitions, Application, Operation, and Test - A111
3. American Petroleum Institute (API)
   a. API 676 Positive Displacement Pumps - Rotary
4. Hydraulic Institute Standards (HI)
5. International Standards Organization (ISO)
   a. ISO 10816 Mechanical Vibration: Evaluation of machine vibration by measurements on non-rotating parts
   b. ISO 14847 Rotary Positive Displacement Pumps - Technical Requirements

1.5 DEFINITIONS

A. Balance of Plant (BOP) Contractor: The party employed by the City to oversee construction efforts, install Contractor's work and coordinate Contractor's and Subcontractor's work on the site.

B. City: The City of Pasadena, CA

C. Contractor: The Contractor, or individual, partnership, corporation, joint venture, or other legal entity having a Contract with the City to perform the Work specified directly or by reference in Section 481100, Combined Cycle Power Island Equipment.

D. General Manager: The General Manager of the Water and Power Department, or his/her properly authorized agent, representative, or engineer, acting within the scope of the particular duties and authorities delegated to them.

1.6 SYSTEM DESCRIPTION

A. Design Requirements

1. All equipment shall be designed for a thirty (30) year life objective. Components for which this service life cannot be expected shall be identified and those components shall be designed for ease of replacement and maintenance.
2. All equipment shall be designed and assembled to provide suitable access for operation and maintenance of the equipment.
3. All equipment shall be designed for continuous 24 hour per day operation with potential daily cycling from off-line to full load.
4. The pumps shall be suitable for continuous outdoor operation in the ambient conditions as detailed in Section 480020, Site Conditions.
5. Each pump shall be completely assembled, piped and mounted on a common base plate aligned with the electric driving motor.
6. When a standby pump is required it shall be designed to start automatically in an emergency situation when the failed operating pump shuts down.
7. The pump materials shall be suitable for the fluid being pumped. Refer to attachments for fluid description and recommended pump materials.
8. When multiple pumps are supplied, pumps shall be identical in design and component parts shall be interchangeable. It shall be possible to operate both the pumps together and they shall remain inherently stable when running in parallel while in this mode.
9. The characteristics of the motors shall be such that the pumps will not exceed the rated capacity and temperature rise under any operating conditions.

B. Performance Requirements

1. The BOP Contractor shall guarantee the following:

a. Capacity without negative tolerance.
b. Total developed pressure without negative tolerance and plus 3% at the design capacity.
c. NPIP (Net Positive Inlet Pressure) required without positive tolerance minus 10% at design capacity.
d. Pump efficiency without negative tolerance.
e. Shutoff pressure without positive tolerance above guarantee, minus 3%.
f. Acceptable total developed pressure deviation amongst identical units of 2% at design capacity.
g. Wire-to-fluid horsepower input at pump design operating point, corrected to actual fluid temperature within HI tolerances.

2. The pumps shall be suitable for both continuously and intermittent service and shall operate satisfactorily without vibration, cavitation, or distress to any part through an operating range from minimum flow to maximum specified capacity.
3. The pump selection shall maintain an $NPIP_{req}/NPIP_{avail}$ ratio of 50% at the runout flow condition. The pump run-out flow shall be defined as no more than 120% of design.
4. The pump sets (pump, motor and base) shall be designed to avoid occurrence of one-half, first, second, and third harmonic critical speeds in undamped condition resulting in amplified excitation of vibration levels. A lateral and torsional evaluation shall be conducted to assure the avoidance of critical speed.
5. BOP Contractor shall guarantee that the equipment supplied shall meet the specified noise criteria in Section 480031, Combined Cycle Power Island Noise Control Performance when tested in accordance with ASME PTC 36.

C. Reliability: No single failure of an auxiliary component or system shall result in damage to the System. The BOP Contractor shall provide adequate redundancy to meet this requirement. BOP Contractor shall clearly identify which non redundant components or systems are capable of causing a forced outage of the unit in the event of a failure. BOP Contractor shall provide additives for redundancy for these systems and components.

1.7 SUBMITTALS

A. Information to be furnished with the Bid:
1. Proposal shall be prepared in accordance with Section 481200, Combined Cycle Balance of Plant. BOP Contractor shall furnish all the information requested on the attached datasheets and in addition provide the following documentations:
   a. Preliminary physical descriptions of all quoted equipment.
   b. List of warranties and guarantees.
   c. Completed “Technical Datasheets by BOP Contractor” attached to this Section
2. The BOP Contractor is encouraged to submit as many documents and drawings as necessary to define the supplied equipment.

B. Information required after Contract Award:
1. Refer to Section 481200, Combined Cycle Balance of Plant for general submittal requirements after contract award including the following documentation:
   a. Complete list of electrical loads associated with the BOP Contractor’s scope of supply. For all loads, the list shall contain description, location of the interconnect, voltage, ampere rating, phase, rated load, operating load, service factor, and whether operation is continuous, intermittent, or emergency only.
   b. Motor data including manufacturer, equipment tag number, horsepower (HP), voltage, ampere rating, phase, service factor, enclosure, insulation, rpm, efficiency, and accessories.
   c. Noise data including estimated sound power levels for the eight octave bands, corrections for silencers, ducts distance etc. and an estimated logarithmic summation for the driver and driven equipment.
   d. Characteristic Curves:
      1) Certified pump characteristic curves shall be submitted for each pump. Curves shall indicate total head, efficiency, brake horsepower, NPSH required, and required submergence as ordinates, with capacity in gallons per minute as the abscissa.

2) Curves shall be submitted for maximum and minimum impeller designs which may be fitted to the pump casing and for the impeller design being provided. When variable speed or two speed drivers are specified, pump performance curves shall be submitted for rated impeller diameter at 10% speed increments from 60% - 100% speed.
3) The characteristic curves shall indicate pump performance from zero capacity to the pump runout capacity.
4) Speed-torque curves, including reverse rotation speed-torque characteristics and inertia (WR^2) values for the pump, shall also be submitted.

C. Shop Drawings
1. Refer to Section 481200, Combined Cycle Balance of Plant for general shop drawing requirements.

D. Operation and Maintenance Manuals
1. Refer to Section 481200, Combined Cycle Balance of Plant for general operation and maintenance manual requirements.
2. Maintenance instructions shall include as a minimum the following topics:
a. Data Sheets.
b. Special shipping, handling, and storage instructions.
c. Lubrication requirements.
d. Maintenance and repair instructions, including procedures, checklists, tolerances, clearances and hazards.
e. Special tool or facility needs, etc.
f. Bill of materials.
g. Descriptive literature.
h. Parts Lists (commissioning spares, start up spares, two-year spares, complete parts lists)
i. Applicable MSDS
j. Mechanical/Electrical Drawings

1.8 QUALITY ASSURANCE

A. Refer to Section 481200 Combined Cycle Balance of Plant for general quality assurance requirements.

B. Testing
1. Certificates and records of all shop tests shall be submitted to the General Manager for approval at least one week before shipment.
2. Certificates and records shall include, as a minimum:
a. Mill-test certificates for casing, impellers, and shafting or other components (if required by the governing code).
b. Pump performance-test reports, including test data and performance curves
c. Motor test reports
d. Hydrostatic test reports
e. “As Built” pump data sheets

1.9 PACKAGING, DELIVERY, STORAGE, AND HANDLING

A. Refer to Section 481200, Combined Cycle Balance of Plant for general Packaging, Delivery, Storage, and Handling requirements.

1.10 SITE CONDITIONS

A. Refer to Section 480020, Site Conditions.

1.11 WARRANTY

A. Refer to Section 481200, Combined Cycle Balance of Plant for general warranty requirements.

B. The pumps shall be guaranteed to operate satisfactorily without damaging pitting, cavitations, or excessive vibration, when pumping against system pressure and when starting or stopping a pump with another pump in operation on the header.

1. The following shall be guaranteed:

a. Capacity at the design operating point.
b. Total developed pressure at the design operating point.
c. Pump efficiency at design operating point.
d. Horsepower required at the design operating point and maximum horsepower requirement.
e. Shutoff pressure.
f. Proper, stable operation with pumps in parallel over the range from recommended minimum flow to maximum, or 120% of design capacity, whichever capacity is greater.
g. Single pump operation from the recommended minimum flow to runout flow at minimum system resistance.
h. No critical speed at or near pump operating speed. All critical speeds shall be at least 25 percent greater than the highest operating speed.

2. Any pump not meeting the guarantees shall receive all adjustments, repairs, additions or replacements as required for it to meet the guarantees.
3. Pumps shall be designed to have a required NPIP at one pump run-out conditions of no more that 75% of the NPIP available. Reliability during all operation is a major consideration.

PART 2 - PRODUCTS

2.1 MATERIALS AND WELDING

A. Products which contain asbestos are prohibited. This prohibition includes items such as packings or gaskets even though the item is encapsulated or the asbestos fibers are impregnated with binder material.

B. Materials of Construction

1. The pump shall be manufactured using materials that meet or exceed the strength and corrosion-erosion resistance of the following listed materials. Selection of pump materials for each pump application shall be subject to the approval of the General Manager.
2. Ammonia is corrosive to aluminum, zinc, and copper. Use of these materials should be minimized in aqueous ammonia handling systems and not allowed in contact with wetted parts.

3. The construction materials for pumps identified as all stainless steel are as follows:

    a. Casing – Stainless steel ASTM A276 Type 316 or General Manager approved equal.
    b. Driver and Idler Gears – Stainless steel ASTM A276 Type 316 or General Manager approved equal.
    c. Wear Plate - Stainless steel ASTM A276 Type 316 or General Manager approved equal.
    d. Shaft - Stainless steel ASTM A276 Type 316 or General Manager equal.
    e. Base Plate – ASTM A283, A285, or General Manager approved equal.

4. Materials for manufacturing pumps shall be as specified on the individual pump data sheet. General material selections will follow API 676 guidelines for each fluid service. The BOP Contractor shall select suitable materials for pump wear rings and shaft sleeves based on the fluid analysis and technical requirements supplied for the project.
5. Austenitic stainless steel pump parts subject to welding shall be furnished in the "L" grade. Austenitic stainless steel shall be furnished in the solution-annealed condition. Stainless steel components shall not be cold worked by design to enhance mechanical properties. Internally wetted parts shall not utilize coatings.
6. Materials shall be identified with the applicable AISI, ASTM, ASME or SAE number, including material grade on pump data sheets and recommended spare parts lists supplied for the project.
7. If the BOP Contractor recommends any materials that are superior to or alternate to the materials specified, the materials shall be listed as an alternate on the data sheets submitted with the BOP Contractor's proposal.
8. Minor parts not identified shall have corrosion resistance equal to that of specified parts in the same environment.
9. Mating parts, such as studs and nuts, constructed of 18-8 stainless steel or of materials having similar galling tendencies shall be lubricated with an anti-seize compound.
10. Control system components shall be enclosed in a skid-mounted NEMA 4X panel with ZeRust vapor capsules supplied as appropriate for enclosure volume.

C. Welding

1. All welding shall be in accordance with ASME Section IX. Welding procedures for stainless steels shall be designed to minimize sensitization for the heat affected zone. Piping supplied by the pump manufacturer shall be designed to conform to piping code ASME B31.1.

D. Castings

1. Castings shall be sound and free of shrink holes, blow holes, cracks, scale, blisters, and other defects. Casting surfaces shall be cleaned by standard methods such as

sandblasting, shot blasting, or pickling. All mold-parting fins and remains of gates and risers shall be chipped, filed or ground flush.

2. Castings shall not be repaired by peening, plugging, burning in or impregnating. If weld repairs to castings are authorized by the ASTM specification for the material, repair welding shall be in accordance with the applicable ASTM specification. Weld repairs shall be inspected according to the same quality standards as for inspection of the castings. Repairs not covered by an ASTM specification shall be subject to approval of the General Manager.

2.2 EQUIPMENT

A. General Requirements

1. The project is an outdoor installation. The pumps shall be suitable for continuous operation in the ambient conditions exposed to the elements.
2. Pumps shall be designed for a continuous service life of 30 years. Pump components for which this service life cannot be expected shall be identified and those components shall be designed for ease of replacement and maintenance.
3. Design of rotating elements shall be such that all critical speeds shall be at least 25 percent greater than the operating speed.
4. Manufacturer shall provide all connections for suction, discharge, sealing, and venting. Piping shall be in accordance with ASME B31.1. All piping furnished by the Manufacturer shall be provided in ASME standard sizes in nominal English units (inch sizes). The location, size, type, and quantity of all openings, connections, and fittings shall be shown on Manufacturer's drawings.
5. BOP Contractor shall be entirely responsible for the pump-to-motor interface including, but not limited to, the following:

    a. Supply of coupling for joining the pump and motor shafts
    b. Coordination of dimensions between the pump and motor
    c. Machining of the motor shaft to accept the coupling

B. Pumps

1. The ammonia forwarding pumps shall be rotary positive displacement external gear type pump design with sealless leak proof casings. The pumps shall be self-priming, designed for low NPIP, and run dry without damage to the pump.
2. The pumps shall be designed for pulseless fluid transfer from the existing aqueous ammonia storage tank to the ammonia vaporization skid. A charged accumulator shall be provided at the pump discharge if necessary to dampen pulsations in flow or pressure.
3. The pumps will be operated singly or in parallel. Each pump shall operate satisfactorily in two pump parallel operation, in single pump operation, and when bringing on or taking a pump out of service with any other pump, or pumps in service. The pumps shall deliver the pressure and capacity indicated in pump data sheets in this Section.
4. The pumps shall be capable of operating continuously at the minimum flow without damage to the pumping equipment.
5. Pumps furnished for the same service shall be designed to operate continuously in parallel over the pump operating range without cavitations.

6. Where pumps are furnished for parallel operation, these pumps shall be "identical" as defined by the Hydraulic Institute standards, with all replacement parts being interchangeable.
7. The difference in flow for pumps operating in parallel shall not exceed 5 percent throughout the operating range.
8. Pumps shall be capable of both intermittent (start/stop) and continuous operation under flow conditions from minimum flow to runout conditions.
9. Each pump submitted by the BOP Contractor shall be designed for operation as specified in data sheet.
10. Wetted pump parts shall be suitable for the fluid being pumped. Materials specified for the pumps are shown in the data sheets. BOP Contractor may propose alternate materials which in its own experience are more suited to the intended service. The alternate materials shall be subject to General Manager's approval.

C. Pump Characteristics

1. Pumps shall be designed to operate with variable speed motors to supply constant pressure at the outlet tie point with accurate turndown to 10% of normal flow to meet supply requirements of the ammonia vaporization and injection system supplied by the power island equipment Contractor under Section 485413, Once Through Heat Recovery Steam Generator.
2. It is preferred that the pumps have maximum efficiency at approximately design operating capacity and pressure.
3. Pumps shall be suitable for extended operation over the range from minimum to maximum flow without damaging pitting, cavitations, excessive noise, or excessive vibration.

D. Skid Assembly

1. The ammonia forwarding pumps and accessory piping shall be mounted on a common skid. The skid shall be heavy-duty welded steel with full-length longitudinal runners and full depth cross members with sufficient reinforcement to allow a four-point lift of the each complete assembly. Each skid deck shall be covered with checkered plate and fully seal-welded with drainage slope to prevent settling or puddling of rainwater. Jackscrews and foundation bolt holes shall be provided on the outside runner.
2. The skid will be installed in a curbed area for spill containment. The skid footprint must fit within the containment area provided.
3. Seismic and dynamic analyses shall be utilized in the design of the skid assembly to provide a system, which is free of equipment vibration problems and foundation and anchor problems during operation.
4. The Contractor shall supply and install two NEMA two-hole grounding pads near diagonally opposite corners of each skid. Grounding pads shall be in accordance with the electrical standard specifications included in this package.

E. Additional Technical Requirements

1. Noise requirements: Refer to Section 480031, Combined Cycle Power Island Noise Control Performance.

2.3 COMPONENTS

A. To minimize equipment failure and damages caused by unproven components, the General Manager intends to install reliable, proven equipment and components which shall perform in accordance with the specifications. The BOP Contractor shall disclose to the General Manager each design manufacturing procedure, component or assembly which does not have at least two (2) years satisfactory operating experience in similar service. Further, the BOP Contractor shall have manufactured at least two pumps of comparable design, power rating, speed and discharge pressure. The failure to make such disclosures specifically and in writing shall extend the BOP Contractor's warranty to include all direct costs to the General Manager that may result from the BOP Contractor's use of such procedures, components or assemblies.

B. Couplings

1. Sealless magnetic couplings shall be supplied to reduce potential risk of leaking aqueous ammonia to atmosphere. The couplings shall have a high torque capacity to minimize slip between the driver and driven couplings.
2. Couplings shall be attached to driver and driven shafts by press fits and keys.
3. Shaft couplings shall be sized to transmit the maximum brake horsepower requirements of the driven equipment with a service factor of not less than 2.

C. Coupling Guards

1. Safety guards shall be provided for protection of personnel from all exposed moving and/or rotating machine elements in accordance with the requirements of the applicable section of 29 CFR 1910.
2. Each guard shall be fabricated from ASTM A36 steel plate having a minimum thickness of 10 BWG and designed for easy installation and removal.
3. Necessary supports and accessories shall be furnished with each guard.
4. Safety guards for horizontal shafts, shaft couplings, belt sheaves, etc., shall be of the inverted "U" design with sides extending to the equipment base or base plate.

D. Base Plate

1. A cast iron or welded steel equipment base plate shall be provided which is to be installed on a concrete base. Each base plate shall support the unit and its drive assembly and shall be of a neat design with pads for anchoring the units. Motor mounting provisions shall be acceptable to the motor manufacturer. Base plates shall be designed to adequately support the equipment under all conditions without 100% grout fill inside the base plate frame. Equipment bases shall be designed to accept a connection to the plant grounding system. Anchor bolt pattern, number and diameter shall be determined by the Manufacturer, based on the assumption that anchor bolts shall be fabricated from ASTM A36 bar stock material.

E. Bearings

1. Pumps shall be furnished with removable shaft sleeves as required by system design. Where required, the shaft shall be completely protected and isolated from the pumped fluid by incorporating gasketed or similarly sealed joints between the sleeve and the shaft. If the manufacturer's design does not include sealed joints, the pump shaft shall be constructed of a material equivalent to the material of the shaft sleeve.

2. Pump bearings shall be of the oil-lubricated sleeve or anti-friction type. Anti-friction bearing shall be designed for AFBMA L-10 life rating of not less than 130,000 hours. Pumps shall be provided with thrust bearings as required by the system designed to prevent thrust loads from being imposed on the drive motor bearings. Thrust bearings shall be of the Kingsbury type or double roll anti friction bearing as required by the pump service.

F. Casing

1. The pump casing shall be design for close-coupled connection to reduce installation footprint and need for pump alignment in the field.
2. Pump casing connections shall be at least NPS ½" and flanged or machined and studded and oriented for maintenance accessibility. Threaded connections may be used in sizes NPS ½" through NPS 1.5".
3. The pump casing, including suction connection, shall be rated for the design conditions of the pumping system. Suction and discharge connections shall be flanged. Each pump casing shall be furnished with tapped connections for casing drain and vent. Each connection shall be furnished with a solid, hex head, forged steel pipe plug. Casing pressure, drain, and vent connections shall be threaded.

G. Piping

1. The BOP Contractor shall supply all necessary piping, piping supports, isolation valves and fittings for all lines for ammonia, lube oil, vents, drains, instrument control air and instruments. All piping connections shall terminate with flanged or socket weld connections at the edge of the skid.
2. The attached Ammonia Forwarding Pump Skid Piping Arrangement Sketch is provided to show minimum requirements of on-skid piping. The BOP Contractor shall provide sufficient instrumentation to ensure reliable, efficient operation of the system.
3. The material and fabrication of all skid piping and connections to equipment shall conform to ANSI B31.1. Sizes 2" and smaller shall be Schedule 80 minimum and may be flanged, welded or socket welded. Threaded joints with seal welded construction are not permitted.
4. Skid piping shall be designed and fabricated to minimize and eliminate the possibility of gas leakage and provide for individual isolation for instruments and downstream piping without causing a system shutdown in order to isolate a leak or make repairs.
5. Instrument pressure take-off points shall be a minimum of 1/2" and a common pressure take-off connection may be used for pressure gauges and pressure switches or transmitters. Thermowell connections shall be 1" NPT.
6. Relief valves for all equipment shall meet all Federal, State, and local regulations. The BOP Contractor shall furnish and install all relief valves required on all piping and equipment within the Scope of Supply with settings clearly and indelibly marked on the valve or stamped onto the valve's nameplate. The BOP Contractor shall determine sizes and set pressures for relief valves related to the equipment to protect. The relief valve installations shall be complete with all valve vent piping individually routed back to the ammonia storage tank.

H. Instrumentation

1. Refer to Section 481200, Combined Cycle Balance of Plant for general instrumentation requirements.

2. The ammonia forwarding pump skid shall be supplied with a skid mounted control panel with an enclosure and all components suitable for the environment outlined in Section 480020, Site conditions. The control panel shall meet these requirements without the need for purging. Installation shall provide for local control and shall provide remote control by the Plant Control System (PCS) via Ethernet link. All hardware, software and programming required for the control system shall be provided. Local and Remote controls shall be capable of controlling, monitoring and alarming of all functions of system components.
3. Alarms shall be annunciated locally both audibly and visually. Alarms for the skid will consist of a minimum: system trouble, shutdown, pump fault, high temperature.
4. Instruments to be supplied as indicated on the system P&ID. Instruments shall conform to the following:
   a. Pressure gauges shall have a 316 SS block and bleed valve. 4.5" dials shall be used. Minimum ¾" socket weld gate valves shall be used for pressure tap root valves.
   b. Temperature indicators shall have a 4.5" dial. All Temperature indicators shall be supplied with 3/4" or 1" socket weld thermowells.
5. Wiring external to the control cabinet shall be installed in weatherproof rigid galvanized steel (RGS) conduit with appropriate seals and fittings.
6. All alarm and shutdown circuits shall be fail-safe
7. Terminations for external wiring to motor control center feeder shall be provided on a separate terminal strip with ample wiring space.
8. Voltages in the control panel shall not exceed 120vac or 125VDC.
9. Voltage sources to the control panel greater than 24VDC shall be isolable by means of a single switch external to the cabinet.

I. Identification

1. A nameplate shall be securely attached to each pump in a visible location. The nameplate shall be made of stainless steel and attached to the pump with stainless steel screws or rivets. The following information shall be included on the nameplates:

   a. Name of Equipment
   b. Manufacturer
   c. Serial Number
   d. Pump size
   e. Model Number
   f. Design Flow Capacity
   g. Design Pressure
   h. Design Temperature
   I. Maximum continuous speed
   J. General Manager's equipment tag number

J. Auxiliary Equipment Requirements

1. The BOP Contractor shall determine if the aqueous ammonia forwarding pump installation location meets hazardous area classification criteria defined in NFPA 70. If the location meets hazardous area classification, the BOP Contractor shall provide a hazardous area classification plan identifying the classification of each hazardous area and provide electrical equipment properly rated for installation in the hazardous area.
2. Electrical Requirements: Refer to Section 262050 - Low Voltage Motors.

2.4 FABRICATION

A. Shop Assembly

1. The pump assembly and motor shall be installed on a common base plate.
2. The pump shall be connected to the motor by a flexible coupling.
3. The BOP Contractor shall provide only items that are of standard and current manufacturers' construction. Non-standard special items or any other difficult to replace items shall not be supplied without the General Manager's prior approval.

B. Shop/Factory Finishing

1. Cleaning

a. Internal Surfaces

1) All internal surfaces shall be free of gross contaminants, such as heavy deposits of mill or heat treating scale, oil, oxide films, slag, flux, weld splatter, dirt, metal chips, and abrasive particles.
2) Manufacturer's cleaning plan shall ensure that cleaning materials do not adversely affect the surface or base metal in the cleaning, manufacturing, or operational environments and that, once obtained; the cleanliness will be maintained during subsequent manufacturing, shipping, storage and handling.
3) Abrasive blasting shall not be used on surfaces containing areas where grit can accumulate and not be readily removed by subsequent cleaning, rinsing or flushing.

b. External surfaces shall be smooth and free of gross contaminants such as heavy scale, rust, sand, blisters, weld splatter, metal chips, and heavy deposits of oil or grease.

2. Painting

a. Cleaning of surfaces that are not to be coated or painted shall be done in accordance with the Supplier's best recommended practice. Only non-corrosion-resistant materials shall be coated.
b. Insulated surfaces shall not be primed. Stainless steel shall not be painted.

2.5 SOURCE QUALITY CONTROL

A. Non-Destructive Examinations

1. NDE methods, acceptance criteria, and additional general requirements shall be in accordance with the applicable fabrication code and this specification.
2. Visual examination shall be by personnel certified to AWS QC1 requirements. All other NDE shall be by personnel qualified to Level II or Level III requirements of SNT-TC-1A of the American Society for Non Destructive Testing.
3. Visual examination shall be performed before other NDE.
4. Radiographic examinations required shall be done in accordance with the requirements of the appropriate fabrication code or this specification.

B. Tests and Inspections

1. All rotating parts shall be statically and dynamically balanced. Impellers shall be dynamically balanced prior to assembly on the pump shaft. Motor rotors shall also be balanced.
2. Steps shall be taken in the fabrication and assembly to ensure that all mechanical fits are concentric and true to ensure alignment during installation.
3. All welding, welding procedure qualifications and welder qualifications shall be in accordance with the BOP Contractors' ISO-9000 or equivalent qualified program.
4. Within 60 days after Notice to Proceed the BOP Contractor shall submit to the General Manager for review an inspection and test plan which shall include pertinent manufacture and inspection operations. The General Manager may, within 60 days of receipt of the inspection and test plan, and in consultation with the BOP Contractor, select a range of points as a mandatory hold point for inspection before the item concerned can be released for further manufacture or shipment.
5. The BOP Contractor shall give the General Manager at least five working days prior notice in writing of the date on and the place at which any equipment shall reach a mandatory hold point or shall be ready for independent inspection and testing. Unless the General Manager shall advise the BOP Contractor not to proceed with the inspection and testing prior to five days before the date which the BOP Contractor has stated in its notice, the BOP Contractor may proceed and any inspection and tests shall be deemed to have been made in the General Manager's presence, and the BOP Contractor shall forthwith forward to the General Manager duly certified copies of the inspection and test results.
6. BOP Contractor shall give (and cause third parties to give) any representative, designated by the General Manager, full cooperation and assistance in any factory inspection at the premises of BOP Contractor or any other place of manufacture of items supplied hereunder (or components thereof).
7. Major items supplied by BOP Contractor shall be given standard applicable tests at the factory during or at the completion of manufacture, whether manufacture is by BOP Contractor or a third party. A test procedure shall be prepared for each such test which shall describe the test to be performed, the applicable item of equipment being tested, the standards and method of testing, and the testing facility's capabilities and shall state a proposed test date. All test procedures shall be available for review by the General Manager. Successful completion of such test shall be a precondition to shipment of the tested item. The General Manager shall be notified in writing at least 14 days prior to any final factory test of any major components to be supplied.

C. Hydrostatic Tests

1. Equipment, piping, and vessels shall be subjected to a hydrostatic leak test meeting the requirements of the applicable Code or Standard to verify integrity of the pressure boundary. No leakage is acceptable through the pressure boundary wall or assembly joints.

D. Functional and Performance Tests

1. The equipment shall be subjected to functional and performance tests in the BOP Contractor's shop to the greatest extent possible to verify the BOP Contractor's performance guarantees. The performance test for Contract purposes shall be executed at

the final installation by the General Manager in accordance with a test procedure developed by the General Manager and approved by the BOP Contractor.

E. Shop Tests

1. Full information shall be submitted describing the Manufacturer's testing facilities. All tests shall be performed in accordance with the requirements of the latest edition of ASME PTC 8.2, except as otherwise required herein.
2. If testing is specified one pump for each service shall be shop tested for capacity, NPIP required, power requirements, and efficiency at minimum flow recommended for continuous operation, maximum pressure, design point pressure, shutoff pressure, and at as many other points as necessary for plotting an accurate performance curve. Each pump shall be tested with its own motor.
3. Pumps shall be balanced so that peak to peak amplitude of rotor vibration in any plane measured at the pump bearing housing under design speed shall not exceed 1.5 mils over the pump operating range.
4. If the shop tests indicate that the tested pump fails to meet the guarantees stated herein, the other pump(s) for the same service shall be shop tested in accordance with this article.
5. Any pump not meeting the guarantees shall receive all adjustments, repairs, additions or replacements as required for it to meet the guarantees.
6. Re-testing and modifications shall be repeated until all performance guarantees are met or until arrangements are made which are acceptable to the General Manager.
7. Certified copies of performance curves resulting from the testing shall be submitted to the General Manager for acceptance before shipment of the equipment. These curves shall indicate actual test pressure, temperature conditions, and the observed test points.
8. If the pumps are not to be shop tested, then the results of prototype model pump shop tests, previously performed by the manufacturer, shall be used to develop performance curves for the miscellaneous pumps.
9. Complete documentation regarding the prototype model test conditions and results shall be submitted. Complete documentation verifying the development of the performance curves from the prototype model test curves shall be submitted.
10. Certified copies of performance curves resulting from the prototype model testing shall be submitted to the General Manager for acceptance before shipment of the equipment. These curves shall indicate actual test pressure and temperature conditions and the performance curve points corresponding to the observed prototype model pump test points. The performance curves shall be guaranteed.
11. If pump suction test conditions (pressure and/or temperature) differ from the conditions listed, appropriate correction factors shall be applied to the observed test curve, and a corrected curve shall be indicated. This corrected curve shall then represent expected pump performance with the suction conditions listed.
12. The General Manager reserves the right to witness all shop tests. Twenty (20) working days advance notice of all tests shall be given to the General Manager.
13. The General Manager reserves the right to witness all pumps re-testing.
14. BOP Contractor shall submit certified copies of test and inspection reports within 14 days of completion of the inspection or test.

PART 3 - EXECUTION

3.1 SPARE PARTS

A. The BOP Contractor shall furnish a complete priced list of recommended spare parts for two years operation. Spare parts may be purchased separately by the General Manager. A separate list shall identify any recommended spare parts for startup and commissioning. Startup and commissioning spares shall be included in the base bid.

3.2 FIELD QUALITY CONTROL

A. Field Testing

1. Following erection/installation of equipment, General Manager may require equipment to be tested by the BOP Contractor in the installed condition to verify the equipment's ability to operate under the specified conditions and to meet the specified performance guarantees.
2. In the event that the pumps do not meet the performance guarantees in the erected/installed conditions, the BOP Contractor shall make alterations and modifications as necessary to meet the performance guarantees, at the Manufacturer's expense.

3.3 SCHEDULE

A. The BOP Contractor shall provide a schedule for the design, fabrication, shop testing, and preparation for shipment of the equipment furnished by the BOP Contractor. The schedule shall also provide anticipated durations for field erection and testing of the equipment furnished by the BOP Contractor.

PART 4 - ATTACHMENTS

4.1 TECHNICAL DATASHEET BY GENERAL MANAGER

Item	Description:	Units	Ammonia Forwarding Pumps
1.0	Client Name		Pasadena Water & Power
	Project Name		Glenarm Repowering Project (GT-5 Combined Cycle Installation)
1.1	Pump Tag No.(s)		5AST-ZXX-020
1.2	Type:		Rotary displacement
1.3	Quantity Required		2
1.4	Capacity		100%
1.5	Location (Outdoor/Indoor)		Outdoor
1.6	Fluid Pumped		19% Aqueous Ammonia
1.7	Pump Materials:		
	Casing		A276 Type 316
	Shaft		A276 Type 316
	Shaft Sleeve		A276 Type 316
	Wear Plate		A743
	Impeller		A276 Type 316
1.8	Speed	RPM	TBD by BOP Contractor
1.9	Design Flow each (est.)	lb/hr	23
	Suction Pressure (est.)	psia	25
	Design Discharge Pressure (est.)	psia	94.7
	Design Temperature Range (est.)	°F	50-80
	Density of fluid at design temperature (est.)	lb/ft^3	TBD by BOP Contractor
	Pump Efficiency at Design flow	min %	80
1.10	Piping:		
	Size, inlet	in. NPS	TBD by BOP Contractor
	Size, discharge	in. NPS	TBD by BOP Contractor
	Design Pressure	psig	TBD by BOP Contractor
	Design Temperature	°F	TBD by BOP Contractor
1.11	Power, volts/ phase/ Hertz		Refer Section 262050
1.12	Shop Test Required, y / n		No
1.13	Suction Strainer:		
	Type		Wye type with strainer flow area not less than 4 times the pipe size
	Mesh		50
	Fasteners		Quick Opening
	Material		SS
1.14	Minimum Recirculation		Yes, check valve and orifice

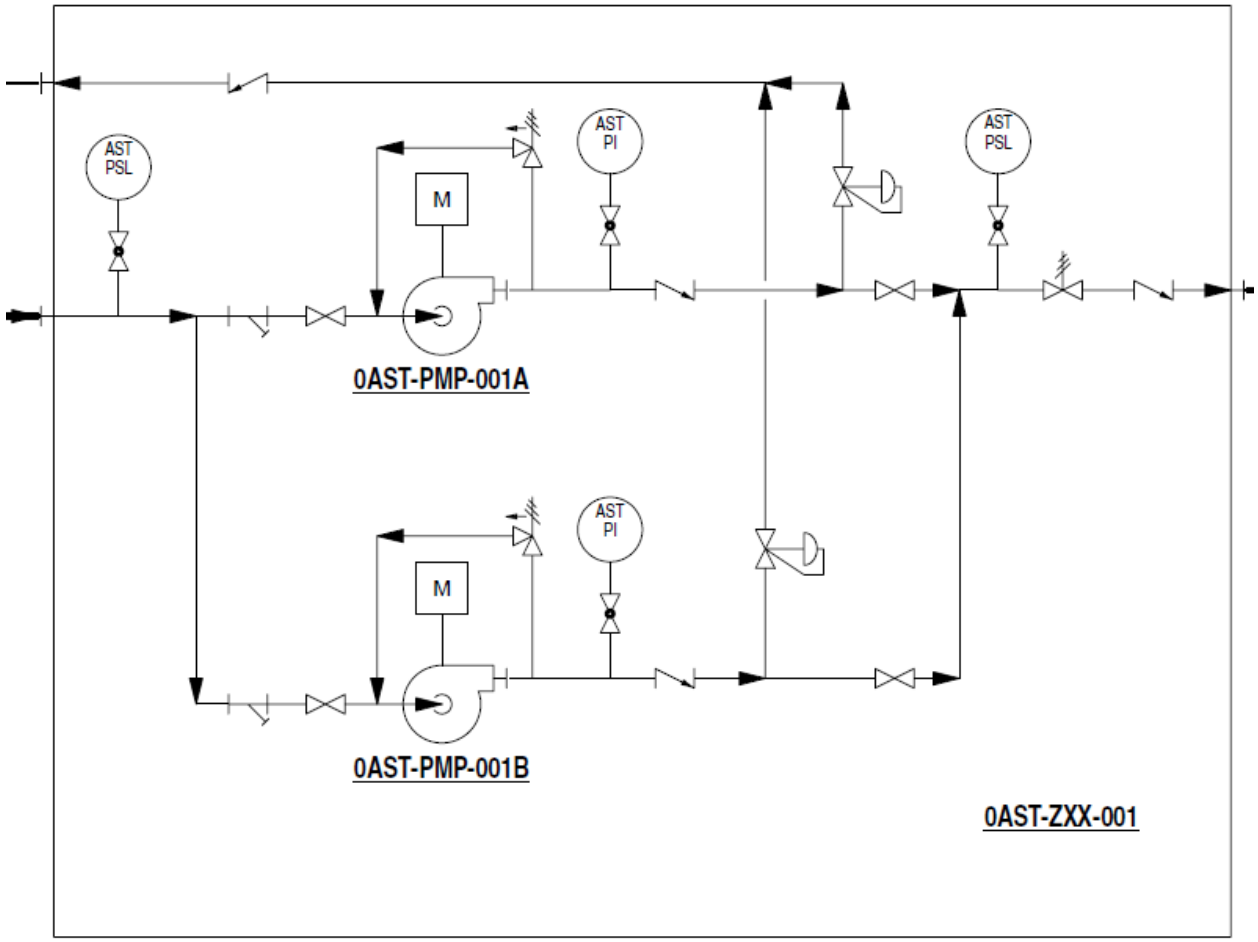
4.2 TECHNICAL DATASHEETS BY BOP CONTRACTOR

Item	Description	Units	
1.0	**GENERAL**		
	Pump Name		
	Tag No.		
	Number of pumps required		
	Pump type		
	Pump model		
	Manufacturer		
	Point of manufacture		
	Delivery, weeks ARO		
	Max. dimension (pumped solids)		
	Rotation direction (view from driver)		
	Number of stages		
	Suction conn. size/type/rating		
	Discharge conn. size/type/rating		
	Casing design pressure	psig	
	Seal/flush plan		
	Seal water required	gpm	
	Pumped fluid description		
	Approx. equip. weight	lb	
	Approx. Dimensions, LxWxH	ft	
2.0	**PERFORMANCE @ DESIGN RATING**		
	Fluid		
	Temperature	°F	
	Specific gravity		
	Flow,	gpm	
	Total pressure	psi	
	Pump speed	rpm	
	NPIP required	psia	
	NPIP available	psia	
	Pump efficiency	%	
	Shaft horsepower	hp	
	Motor Nameplate Rating	hp	
3.0	**OTHER PERFORMANCE DATA**		
	Total pressure @ shutoff	psig	
	Recommended min. recirculation	gpm	
	NPIP required @ 120% of rated flow	psia	
	Flow @ maximum pressure	gpm	
	Maximum pressure	psig	
	NPIP required @ runout	psia	
	Shaft horsepower @ runout	kW	
	For impeller diameter @ BEP		
	Flow	gpm	

Item	Description	Units	
	Total pressure	psia	
	Efficiency	%	
	Max. sound level @ 3', (dBA)	dBA	
	Shutoff pressure	psig	
4.0	**DESIGN DATA**		
	Min. submergence required	ft	
	Line shaft diameter	in	
	Impeller shaft diameter	in	
	Maximum impeller diameter	in	
	Minimum impeller diameter	in	
	Bearing spans	in	
	Max. temperature rating	°F	
5.0	**MATERIALS OF CONSTRUCTION**		
	Casing		
	Shaft		
	Shaft Sleeve - Stationary		
	Shaft Sleeve - Rotating		
	Wear Rings Casing - Stationary		
	Wear Rings Impeller - Rotating		
	Impellers		
	Mechanical Seals		
	Balancing Device - Stationary		
	Balancing Device - Rotating		
	Throttle Bushing		
	Warm-up Orifices, if required		
	Balancing Leakoff Orifices, if required		
	Diffusers		
	Diaphragms		
	Stage Pieces		
	Internal Bolts and Studs		
	Internal Nuts		
	External Bolts and Studs		
	External Nuts		
6.0	**COATING(S) BY ITEM OR SECTION**		
	Items(s) or Section		
	Coating		
	Manufacturer & Designation		
	Final thickness	in	

Item	Description	Units	
	Surface preparation		
	Item(s) or Section		
	Coating		
	Manufacturer & Designation		
	Final thickness	in	
	Surface preparation		

4.3 AMMONIA FORWARDING PUMP SKID PIPING ARRANGEMENT SKETCH



Enclosure 7

March 12, 2014

PASADENA WATER & POWER

Glenarm Repowering Project (GT-5 Combined Cycle Installation)

Section 485951.80
Steam and Water Sample Panel

PROJECT NUMBER:
123374

PROJECT CONTACT:
STEVE HARRIS
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STEVE.HARRIS@POWERENG.COM
PHONE:
208-288-6408

Section 485951.80
Steam and Water Sample Panel

PREPARED FOR: PASADENA WATER & POWER
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SECTION 485951.80
STEAM AND WATER SAMPLE PANEL

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PART 1 - GENERAL

1.1 SUMMARY

A. This Section defines the scope and services, responsibilities, and terminal points for design, fabrication, inspection, testing and certification of a steam and water sample panel. The steam and water sample panel shall be a complete package, including all controls, instruments, components, coatings, interconnecting piping, supports, vents, drains, and appurtenances as required per the referenced specifications including their attachments. It is not the intent to specify completely herein, all details of design and construction of the equipment/systems. However, the equipment/system shall conform in all respects to high standards of engineering, design and workmanship and be capable of performing in continuous commercial operation up to the BOP Contractors guarantee in a manner acceptable to the General Manager.

B. In the event of a perceived conflict between referenced standards, codes and the documents included in this specification, or an apparent conflict with the technical requirements of the specification and the BOP Contractor's ability to meet the performance requirements contained herein, the BOP Contractor shall refer the conflict in writing to the General Manager for resolution.

C. The BOP Contractor shall have single source responsibility for all equipment furnished under this specification. No departure shall be made from this specification and the referenced standards and codes unless specific requirements are waived or amended in writing by the General Manager.

D. Sample locations include the following as a minimum:

1. High Pressure Steam Header
2. Boiler Feedwater Header
3. Condensate Polish Influent
4. Condensate Polish Effluent
5. Circulating Water Return Header
6. Demineralized Water

1.2 FURNISHED BY BOP CONTRACTOR

A. The BOP Contractor will be responsible for the following activities, all in accordance with the requirement of the specification, the data sheets included as an attachment to the specification, and applicable codes and standards. The scope of work shall include design, manufacture, shop testing, packaging, shipping, along with technical direction of the installation and field testing.

1. All skid mounted equipment located inside the water sampling building.
2. All skid mounted equipment including automatic stroke or speed controlled injection pumps, strainers, mixers if required, calibration pots, pulsation dampeners, back pressure valves, external relief valves, contactors for 120 volt single phase motors, junction boxes, etc. to meet the performance guarantees.
3. Supply of motor drives and disconnect switches.

4. One (1) complete set of any special tools required for installation and maintenance of all BOP Contractor supplied equipment.
5. Any lifting or support lugs required for lifting and handling of all BOP Contractor supplied equipment.
6. All local instrumentation necessary for control.
7. Control system consisting of a single, comprehensive, programmable logic controller (PLC) and flat screen control panel interface to operate the entire package.
8. Wiring from instruments/devices on skids up to local common connection point at the control panel.
9. All piping, conduit, valves, supports, and instrumentation (i.e., items normally supplied on a pre-engineered package) required for operation are to be included. BOP Contractor shall give complete description of all items to be included and shall clearly indicate all items required to be supplied by General Manager to complete the system.
10. Finish painting
11. Factory testing and certificates of results
12. Site specific drawings and design data to support facility design, construction and maintenance
13. Inspection certificates and quality control documentation listed in this Section
14. Complete set of component cut sheets
15. Operating, commissioning, installation and maintenance manuals for the supplied equipment.
16. Site installation supervision by BOP Contractor’s personnel
17. Start-up supervision and training by BOP Contractor’s personnel
18. Foundations, grouting and foundation bolts
19. Unloading at site, storage and installation
20. Single 460V power supply
21. Influent water piping to a single tie-in for the component cooling water.
22. Effluent water piping from a single tie-in each for component cooling water, and wastewater
23. Tie-in of all piping, electrical power and control wiring at system interfaces.
24. Control and instrument cabling from equipment/skid junction boxes to the PLC and to the MCC, and between the PLC and Main Control Room.
25. Site civil design including earthing and grounding of equipment
26. Cable trays, supports, and accessories for all interconnecting cabling
27. Control power
28. MCC including power wiring and starters in MCC to all electrical loads
29. Compressed air piping for instrumentation and control valves
30. Design and supply of lighting system
31. Installation of shop assembled skids and erection & installation of equipment and components shipped loose
32. Ladders, stairways and platforms
33. Supply and installation of thermal insulation and heat tracing, if required

B. The requirements of this specification are the minimum for the equipment and shall be supplemented by the BOP Contractor's own requirements.

1.3 RELATED SECTIONS

A. Section 480020 - Site Conditions

B. Section 481200 - Combined Cycle Balance of Plant

1.4 CODES AND STANDARDS

A. Refer to 481200, Combined Cycle Balance of Plant for general codes and standards applicable to the project. The following codes and standards apply to the specific equipment supplied under this Section.

1. American Society for Testing and Materials (ASTM)

a. D1066 - Standard Practice for Sampling Steam

1.5 DEFINITIONS

A. Balance of Plant (BOP) Contractor: The party employed by the City to oversee construction efforts, install Contractor's work and coordinate Contractor's and Subcontractor's work on the site.

B. City: The City of Pasadena, CA

C. Contractor: The Contractor, or individual, partnership, corporation, joint venture, or other legal entity having a Contract with the City to perform the Work specified directly or by reference in Section 481100, Combined Cycle Power Island Equipment.

D. General Manager: The General Manager of the Water and Power Department, or his/her properly authorized agent, representative, or engineer, acting within the scope of the particular duties and authorities delegated to them.

1.6 SYSTEM DESCRIPTION

A. Design Requirements:

1. Reference Section 481200 Combined Cycle Balance of Plant for general design requirements and expected operating profile.
2. The equipment shall be pre-engineered, pre-assembled units that minimize installation and start-up costs. The system shall be fully tested at the factory and require simple utility connections, with minor set up and adjustment, and ready for immediate on-line service.
3. The Steam and Water Sample Panel and its associated conditioning systems will receive, condition, and analyze sample water and steam from the OTSG and steam and condensate systems. The Steam and Water Sample Panel shall comply with data sheets included with this Section.
4. A fully automatic system for taking steam and water samples shall be provided and isokinetic sampling shall be used wherever possible.
5. Circuit isolation shall be provided between power to analyzing equipment and lighting and convenience outlet provided in the dry section.

6. The equipment will be packaged (i.e., skid mounted) to the fullest extent practical to minimize labor required for field installation. Extent of skid assembly shall be as shown on BOP Contractor submitted P&IDs.

B. Performance Requirements:

1. The sample-conditioning panel shall be capable of cooling, condensing, and sub-cooling the samples as identified in this specification to a final, consistent temperature with samples flowing at a rate of 1000 cc/min. Cooling water to be used for the primary sample coolers at a maximum temperature of 100˚F.
2. The sample coolers shall be designed to reduce the sample temperature to within 5°F of the inlet cooling water temperature. Pressure drop across the sample coolers shall not exceed 10 psi.
3. The sample panel shall be provided with equipment as required to perform the functions described. The sample panel shall be segregated into a wet (sampling conditioning) section, a wet analyzer section, and a dry analyzer section.

1.7 SUBMITTALS

A. Information to be furnished with the Bid:

1. Proposal shall be prepared in accordance with Section 481200, Combined Cycle Balance of Plant. BOP Contractor shall furnish all the information requested and return the following documents:

a. BOP Contractor's list of previous system installations.
b. Clarifications to the technical specification.
c. Preliminary Process and Instrumentation Diagram with the line sizes, piping materials, system layout, skid connection limits, valves, and other devices.
d. Preliminary general arrangement drawing including overall dimensions, estimated weights and loadings, support details to include anchor points, and reference locations of analyzers, indicators, interface, and tie-in points.
e. Equipment weights broken down into parts shipped separately and maximum lifts to assemble.
f. Process description
g. Heat load data for sample cooling system
h. Operating conditions at maximum and minimum flows
i. Materials selection
j. Utility requirements
k. Energy consumption.
l. Electrical load list – preliminary.
m. Chemical requirements including quantity and form.
n. Pricing and description of services included in engineering support for installation and startup.
o. Optional equipment pricing.
p. List of consumables and reagents required to support operations, including manufacturer/supplier name and part number.
q. Equipment list with sizing information.
r. Routine maintenance requirements.
s. Controller, I/O, and HMI model numbers.

t. Completed data sheets enclosed as attachments to the specification.
u. BOP Contractor shall notify General Manager of any modifications to his standard design required to meet these specified requirements.

B. Information required after Contract Award:

1. After the award of contract, the following data and drawings shall be submitted to the General Manager for approval:

a. A detailed Process and Instrumentation Diagram. The diagram shall clearly indicate the line sizes, piping materials, system layout, skid connection limits, valves, and other device sizes, pneumatic and instrument loops, instrument loop functionality, and other specified details.
b. General arrangement drawing including overall dimensions, estimated weights and loadings, support details to include anchor points, , and reference locations of analyzers, indicators, interface, and tie-in points.
c. Location and manner of equipment supports including anchor bolt sizes and locations. Equipment weights shall also be included for foundation design.
d. Reserved space for airflow or maintenance access areas (for items such as control panels, motors, filters, valves, etc.) shall also be shown.
e. Details of all inlet and outlet boundary connections. Details shall also include the pipe centerline elevation and plan location referenced back to the anchor bolt locations. Details shall also include drain connections and locations of all electrical power connections.
f. BOP Contractor shall provide I/O lists, schematics, and electrical wiring diagrams, bill of materials, motor datasheets, and logic diagrams. The logic diagrams shall provide the logic needed to start-up, automatically operate, and shutdown the system. Schematics shall also detail all monitoring and alarming functions.
g. Layout drawings, general assembly, components, dimensions, weights, clearances, methods of assembly, and O&M manuals.

C. Prior to product completion, the BOP Contractor shall provide the following:

1. Quality control test reports confirming successful testing.
2. Quality assurance testing and examination report.
3. Operating and maintenance manual of all components furnished.

D. Shop Drawings

1. Refer to Section 481200 Combined Cycle Balance of Plant for general shop drawing requirements.

1.8 QUALITY ASSURANCE

A. General:

1. Refer to Section 481200 Combined Cycle Balance of Plant for general quality assurance requirements.

1.9 PACKAGING, DELIVERY, STORAGE, AND HANDLING

A. Refer to Section 481200, Combined Cycle Balance of Plant for general delivery, storage, and handling requirements.

1.10 SITE CONDITIONS

A. Reference Section 480020, Site Design Conditions.

1.11 WARRANTY

A. Refer to Section 481200, Combined Cycle Balance of Plant for general warranty requirements.

PART 2 - PRODUCTS

2.1 MATERIALS AND WELDING

A. Refer to Section 481200, Combined Cycle Balance of Plant for general material and welding requirements.

2.2 EQUIPMENT

A. General

1. The system shall be the BOP Contractor's standard design, modified as required to comply with this specification.
2. The equipment and materials specified are intended to be the minimum suitable for the intended service. They are not intended to limit the BOP Contractor's responsibility for proper design and selection of equipment. It is the BOP Contractor's responsibility to supply a complete system for the intended service and the specification is only for general guidelines. Any changes in proposed equipment or materials during design shall be approved by General Manager prior to incorporation into the design.
3. The equipment shall be designed to provide maximum practical operational reliability using standard, commercially available equipment, i.e. vessels, valves, pumps, PLC, etc.
4. The equipment shall be designed to provide trouble-free operation during start-up, shutdown, and system operating modes.
5. The design of equipment, arrangement of components, and routing of piping shall consider operational and maintenance accessibility of components. Equipment, piping, valves, and instruments shall be arranged so that when installed, components requiring manipulation, observation, or maintenance will be readily accessible and safe to operating and maintenance personnel.
6. BOP Contractor shall provide equipment and components Sub Contractor's list for General Manager's approval.

B. The design of equipment, arrangement of components, and routing of piping and electrical conduit shall consider operation and maintenance accessibility of components. Equipment, piping, and conduit shall be arranged so that when installed, components requiring manipulation, observation, or maintenance will be readily accessible with safe access for operating and maintenance personnel.

C. A pressurizing blower, filters, and on/off switch shall be furnished and installed in the upper 1/3 of the side of the dry enclosure. Wet analyzers shall be located outside of the dry enclosure.

D. The wet section shall receive samples, routed from specified points in the plant to the sample-conditioning panel, for the indicated continuous analyses, monitoring, and recording. Monitoring shall be by dedicated analyzers, unless otherwise stated. Dual channel analyzers shall be used where specified.

E. The wet section shall have an integrated sample sink that shall run the entire length of the front of the section. Construction shall be a minimum of 12 gauge 304SS. Minimum dimensions of the sink shall be 203mm deep and 203mm wide. There shall be a working shelf on the front of

the sink a minimum of 152mm wide. The top of the sink and shelf shall be approximately 762mm above the working floor.

F. The wet section shall contain, at a minimum, the following sample temperature and pressure conditioning equipment capable of cooling each sample point:

1. Sample Temperature and Pressure Indication
2. Sample Cooling Coils
3. Over Temperature Controls
4. Low pressure blowdown
5. Rod-in-tube High Pressure Reducing Valves
6. Sample Analyzer Branch Line
7. Safety Relief Valves
8. Sample Backpressure Valves
9. Total Sample Flow Indicators

G. The dry section shall contain, at a minimum, the following equipment to conduct the analysis as delineated:

1. Dual Channel Specific Conductivity Analyzer
2. Dual Channel Cation Conductivity Analyzers
3. Dual Channel pH Analyzer
4. Silica Analyzers
5. Sodium Analyzers
6. Dissolved Oxygen Analyzers
7. One month supply of reagents for silica and sodium analyzers

H. Skid Assembly

1. Components on a skid mounted assembly shall be installed properly and completely pre-piped and pre-wired. Electrical and control signal interface connections for all systems required to support both equipment specified in this specification and equipment in General Manager's systems shall be brought to a single distribution panel and terminal strip within the dry section. Alarm signals from individual analyzers are not used and therefore shall not be run to this location. Access to the panel by the General Manager for external wiring/signals shall be provided from the top of the dry section. The dry section shall be a NEMA 12 designed enclosure with the exception of the muffin fan required for condensation protection. BOP Contractor/General Manager piping and tubing interface connections shall terminate at the sampling/analyzer system plot boundary. Piping and tubing shall be supported from skid or equipment.

I. Structural Design

1. Refer to Section 481200, Combined Cycle Balance of Plant for general structural design requirements.

2.3 ACCESSORIES

A. Enclosure

1. The sample panel shall be freestanding with the dry section totally enclosed. The back of the wet section shall be open rack type. The front, top and sides shall be enclosed. The entire panel front shall be constructed of minimum 10 gauge carbon steel with stiffeners and a frame as required. The panel front shall extend the entire length of the enclosure from the bottom to the top with no visible seams.
2. The complete sampling/analyzer system shall be furnished in a climate controlled weather proof shelter. The shelter shall be equipped with access doors at each end of the unit. The shelter shall have adequate access to allow maintenance and normal operation of the all equipment and instrumentation. All lighting, HVAC and smoke detection systems shall be included.
3. Doors and equipment of the dry section shall be such that all items are readily accessible for maintenance, repair, calibration, and adjustment. No equipment shall be located within 153mm of the top or sides, or within 305mm of the bottom of the panel.

B. Piping and Valves

1. All piping and valves required to take samples from the relevant sampling points to the sampling panel and from there to drain shall be furnished by the BOP Contractor.
2. All sample tubing and valves up to and including the blowdown valve at the sample panel shall be 1/4 inch, Type 316SS, A249 Welded Average Wall construction to minimize lag time from the point of sampling.
3. Cooling water piping and blowdown and waste header piping shall be ASTM A53 grade B carbon steel construction. Cooling water pipe shall have MNPT connections.
4. Sample lines shall enter the top of the panel and shall use bulkhead connections furnished by the BOP Contractor.
5. The waste cooling water and blowdown headers shall be piped to the side of the panel at the opposite end of the dry section.
6. All valves and components mounted in the tubing shall be adequately supported from the panel.
7. All sample lines and piping having design temperatures above 49°C shall have asbestos-free insulation installed for personnel protection.
8. Piping to all conductivity and pH cells shall be arranged such that cells are maintained full at all times. Cell holders shall be used when necessary.
9. Pipe ends for socket weld connections shall be reamed to remove all burrs and obstructions.
10. All piping and tubing shall be neatly installed and securely braced such that expansion and contraction, as a result of pressure-temperature cycling between ambient conditions and design sample conditions, will not impose any excessive stress.

C. Sample Coolers

1. All sample coolers shall be vertically mounted on the back of the panel with a minimum of 150mm centers to allow for maintenance access. The shell shall be a removable design to allow for cleaning and inspection. Cooler shell and bolts shall be stainless steel. The cooling coils shall be constructed of Type 304SS, 316SS, or Inconel. Unions or compression fittings shall be provided as required to allow removal of the cooling coil. Minimum design pressure of the cooler shell shall be 21 barg @ 121°C. Minimum design pressure of the coils shall be 345 barg @ 538°C. Bath systems are not an acceptable alternative design.

D. High Pressure Reducing Device

1. A rod-in tube pressure-reducing device shall be installed in all sample lines after the primary sample cooler where sample pressure exceeds 35 barg. Device shall be rated for the pressures shown for the specific sample.

E. Back Pressure Valves

1. Each backpressure valve shall maintain a constant upstream sample pressure of 1.4 barg to ensure constant sample flow rates through upstream cell branch lines. Variations in sample flow rate to individual cells shall not exceed 5% when the total sample flow demand is increased or decreased due to a change in the number of individual cells receiving sample flow from a given stream.

F. Grab Sample Connection

1. Grab samples shall discharge to the sample sink.

G. Analyzer Over-Temperature Control

1. A mechanical High Temperature Shut-off valve with a latching mechanism to latch closed at 49ºC shall be supplied for all samples operating above 49ºC. The high temperature device must latch closed and must require manual reset.

H. Safety Relief Valves

1. Sample safety relief valves shall relieve to the drain header if operating at 3.5 barg or above. If operating at 1.4 barg or below the relief valves may discharge to the sink.
2. Cooler water side safety relief valves shall be set to relieve at 10.3 barg, and shall discharge to the sink.

I. Identification

1. Equipment shall be furnished with a permanently attached stainless steel nameplate having embossed or raised letters. The nameplate shall include, but is not limited to, the following:

    a. Manufacturer's name
    b. Model number
    c. Serial number
    d. Year built
    e. Design capacity or volume
    f. Design pressure and temperature
    g. Speeds – Rotating equipment
    h. Set pressure – Relief valves
    i. Equipment number
    j. Equipment contract number
    k. PO number

2. Nameplates shall conform to applicable requirements of Technical Specifications and Referenced Codes and Standards.

3. Each front of panel mounted instrument and control device shall have its tag number and service on a nameplate permanently mounted with stainless steel drive screws. A nameplate indicating the tag number shall be mounted inside the panel next to front-of-panel mounted instruments and devices. The same type of nameplate shall be installed for tag numbered devices which are contained wholly within the panel. Nameplates shall be laminated plastic with black engraved characters on a white background.
4. Bulkhead fittings, panel piping, tubing, and wiring terminals shall be identified permanently with designations reviewed by General Manager. These designations shall correspond to those on the drawings.
5. A control cabinet nameplate that identifies the BOP Contractor may be furnished by the panel fabricator and mounted on the top center section of the control cabinet.
6. Field mounted instruments shall have an identifying nameplate attached permanently by stainless steel drive screws. The nameplate shall be made of stainless steel. The nameplate shall include the complete tag number stamped or engraved in characters ¼" high. For small items such as thermometers and pressure gages, characters may be smaller, and the nameplate shall be laminated plastic with black engraved characters on a white background.

2.4 ELECTRICAL

A. All circuits shall be factory wired and tested at operating voltage. The BOP Contractor shall complete all internal wiring between devices. All device terminals shall be connected to terminal blocks for field wiring. All wiring external to the skid shall enter and exit the panel from the top of the panel.

B. All terminal connections shall be plainly marked in accordance with the BOP Contractor's connection diagrams. The BOP Contractor shall provide all necessary internal panel wiring and branch circuit protection. If a plug connection is used by any analyzer, multiple outlet strips shall be provided inside of the dry section.

C. The control circuit shall incorporate branch circuit protection within the panel utilizing circuit breakers. Circuits to each monitor and analyzer shall use separate breakers and shall be connected to separate terminal blocks so that the device can be disconnected without interrupting the circuit to other devices. Fusing integral to the equipment is acceptable.

D. Receptacles shall be provided inside and outside of the wet side of the sample panel and inside the dry side enclosure. Three GFI type duplex convenience outlets shall be provided: one on the front of the wet section of the sample panel below the work surface, one located inside the dry section enclosure, and one located on the back of the wet section. The dry section enclosure interior shall be illuminated with the BOP Contractor's standard lighting. A light switch shall be provided.

E. Terminal blocks provided for all circuit wiring shall be equipped with wire clamps and white fiber marking strips. Terminal blocks shall be of flame-retardant materials. No terminal block shall carry more than two conductors on either side of any terminal.

F. Wiring mounted to swing panels or subject to movement shall be grouped into bundles, have extra-flexible conductors, and have a plastic, wire loom over wire bundles.

G. Motors for auxiliary services shall be in compliance with Section 482610, Low Voltage Motors.

H. All PLC's and/or controllers to have available connections for UPS power feeds.

I. Electrical Codes and Standards – All electrical devices and materials shall be furnished and installed per the NEC (National Electrical Code, NFPA 70), Electrical Codes and Ordinances and all other applicable electrical codes and standards and shall be listed and labeled.

2.5 INSTRUMENTATION AND CONTROL

A. General

1. Refer to Section 481200, Combined Cycle Balance of Plant for general instrumentation and control requirements and instrument calibration requirements.
2. All instrumentation required for automatic operation and monitoring of the equipment shall be provided by the BOP Contractor. This shall include necessary protective devices for alarm or alarm and shutdown, as required, for abnormal conditions of pumps, temperatures, flow, etc.
3. All gages and differential pressure transmitters shall be provided with root valves installed in the piping system. All meters and gages shall be supplied with scales utilizing imperial units.
4. The control system shall include a free standing NEMA 4 control enclosure, Programmable Logic Controller (PLC) with necessary I/O, and a Human Machine Interface (HMI) to operate and monitor all BOP Contractor supplied equipment.
5. The PLC shall provide an interface to the DCS via Profibus over Ethernet or Modbus TCP/IP protocol. Processor utilization shall not exceed 80%. The system shall be supplied with 20 % spare "hot" pre-wired analog & digital I/O and 10 % spare rack space. The capability to interface the PLC to the plant DCS via Ethernet/OPC interface shall be supplied.
6. The HMI shall be a desktop mounted Industrial Grade PC with keyboard, mouse and 19" color flat screen monitor.
7. All control components (hardware and software) shall be identified in the proposal. BOP Contractor shall also provide a list of all instrumentation to be furnished in the proposal.
8. All General Manager connections and interconnecting wiring to BOP Contractor supplied equipment shall be on numbered terminal strips.
9. General Manager will supply a hard wired digital out (dry contact) to BOP Contractor's PLC for remote enable/disable
10. BOP Contractor shall supply a hard wired digital input (dry contact) to General Manager's DCS to alarm any trouble.
11. All BOP Contractor supplied equipment interfacing with General Manager's control equipment shall be compatible with 4-20mA electronic signal ranges. Control power is available at 120 VAC.

B. Instrumentation and Control System

1. Each sample shall have, as a minimum, temperature, pressure and flow indication on the front of the panel.
2. Differential Pressure Gages

    a. Differential pressure gages shall be diaphragm type.

3. Pressure Gages

a. Pressure gages shall be liquid filled with 64mm minimum diameter dials. Gage dial range shall be selected such that the normal operating point is 33 % to 66 % of full scale. The scale range shall be in barg. Gages shall be panel mounted and secured to the panel front with suitable mounting brackets.

4. Temperature Indicators

a. Temperature indicators shall be mounted in thermowells.

5. Flow Indicators

a. Each sample rate of flow indicator shall have a 76mm scale length with a stainless steel float, integral rate set valves, stainless steel construction, and a capacity of 0 to 500 cubic centimeters per minute.
b. Each sample line shall have a total flow indicator upstream of any branch flows. The indicator shall have a 76mm scale length with stainless steel float, stainless steel construction, and a capacity of 0 to approximately 1500 cubic centimeters per minute.

C. All necessary chemical monitoring instruments shall be provided for the safe and efficient operation of the plant, to ensure optimum water quality. A minimum of two spare sample ports shall be included in addition to the following sample locations:

1. High Pressure Steam Header
2. Boiler Feedwater Header
3. Condensate Polish Influent
4. Condensate Polish Effluent
5. Circulating Water Return Header
6. Demineralized Water

D. Chemical monitoring instruments

1. Specific Conductivity Analyzers

a. Specific conductivity cells/analyzer shall be Rosemount model 1055, or equivalent. Conductivity sensors shall be model 400. Each cell shall be provided with an automatic temperature compensator compatible with the monitors. Cell constants shall be proposed by BOP Contractor and require acceptance by General Manager. Monitor shall produce 4-20mA output. Each monitor shall be provided with a nameplate that states the sample name(s), and sample number(s).

2. Cation Conductivity Analyzers

a. Cation conductivity analyzers shall be Rosemount 1055, or equivalent. Conductivity sensors shall be model 400. The analyzers shall be furnished with ion exchange columns and color indicating resin. Ion exchange resin column shall be easily removed for replacement or refilling without disassembly of upstream or downstream piping. Refillable resin columns are an acceptable design alternative. Each resin column shall be designed with a vent to remove air trapped during resin replacement or refilling. The discharge from each analyzer shall be piped to a conductivity cell complete with cell enclosure and automatic temperature

compensators compatible with the monitors. Cell constants shall be proposed by BOP Contractor and require acceptance by General Manager. Monitor shall produce 4-20mA output. Each monitor shall be provided with a nameplate that states the sample name(s), and sample number(s).

3. Degassed Cation Conductivity Analyzers

   a. Degassed cation conductivity analyzers shall be Rosemount model 1055 with a reboiler, or equivalent. Conductivity sensors shall be model 400. The analyzers shall be furnished with ion exchange columns and color indicating resin. Ion exchange resin column shall be easily removed for replacement or refilling without disassembly of upstream or downstream piping. The discharge from each analyzer shall be piped to a conductivity cell complete with cell enclosure and automatic temperature compensators compatible with the monitors. A sample cooler shall be provided with the analyzer/reboiler.

4. pH Cells/Analyzers

   a. pH analyzers shall be Rosemount model 1055, or equivalent. pH sensors shall be model 399. pH cells shall be flow through type with PVC flow chamber. Each cell shall be furnished complete and installed. Reference electrodes shall be diffusion type electrodes. Automatic temperature compensators shall be compatible with the monitors. High purity pH sensors (model 320HP) shall be used for sample streams operating below 10 micromhos. Modifying a general purpose pH sensor is not acceptable. Monitor shall produce 4-20mA output. Each monitor shall be provided with a nameplate that states the sample name(s) and sample number(s).

5. Silica Analyzer

   a. Hach model 5000 Series. A sequencer with “track and hold” capabilities shall also be provided along with the appropriate solenoid valves, power supplies, and manifold to allow for up to four (4) samples per analyzer. Stream by-pass will allow for continuous sample flow from the source between analysis periods. Monitor shall produce 4-20mA output signals. Each monitor shall be provided with a nameplate that states the sample name(s), and sample number(s).

6. Sodium Analyzer

   a. Orion 1811EL or equivalent. Sample will be analyzed and dumped to drain. A sequencer with “track and hold” capabilities shall be provided with appropriate solenoid valves, power supplies and manifold to allow for up to three (3) samples per analyzer. Stream by-pass will allow for continuous sample flow from the source between analysis periods. Monitor shall produce 4-20mA output signals. Each monitor shall be provided with a nameplate that states the sample name(s) and sample number(s).

7. Dissolved Oxygen (DO) Analyzer

   a. Rosemount model 1055 and trace dissolved oxygen probe or equivalent. The probe shall be model number 499AtrDO, or equivalent, with Variopol connection.

Monitor shall produce 4-20mA output signals. Each monitor shall be provided with a nameplate that states the sample name(s) and sample number(s).

2.6 FABRICATION

A. Shop/Factory Finishing

1. Cleaning

a. Surfaces of the base shall be cleaned of all scale, rust, grease and other foreign matter. BOP Contractor supplied pre-painted items, stainless steel tubing and any other non-carbon steel items shall be solvent cleaned.

2. Painting

a. After cleaning, the base and the exposed piping shall be primed and painted. Prior to shipment, the entire skid including the base, exposed piping, pre-painted BOP Contractor items, tubing and all other non-carbon steel items shall be primed and painted.
b. Stainless steel surfaces shall not be painted. Standard components such as pumps, motors, valves, etc. shall be finish coated in accordance with the manufacturer's standards.
c. BOP Contractor shall fully describe the color and proposed coating system for all BOP Contractor supplied equipment. Equivalent coating systems by other manufacturers must be submitted for approval to the Engineer/General Manager prior to fabrication of the equipment.

3. Cleanliness and Workmanship: All parts, components and assemblies shall be thoroughly cleaned prior to and after assembly and test, including removal of all loose, spattered or excess soldering or welding materials, burrs and sharp edges. All openings are to be securely covered against entry of foreign material after cleaning.

2.7 SOURCE QUALITY CONTROL

A. Tests and Inspections

1. Inspection and testing shall be in accordance codes specified.
2. Instruments shall be protected during hydro testing.
3. Filters shall be removed for hydro test of filter housing.
4. Wiring shall be checked for continuity and insulation integrity.
5. Full information describing the tests which are included in the price quotation shall be included with the Proposal.
6. The BOP Contractor shall establish an inspection plan for the equipment that will include observation by the General Manager of pertinent manufacture and test operations. The BOP Contractor shall cooperate with, and assist as necessary, the General Manager's inspectors.
7. Certified copies of test results shall be submitted for acceptance before shipment of the equipment is made.

8. Major items whether fabricated by the BOP Contractor or manufactured by a third party shall be given standard applicable tests during or at completion of the equipment fabrication.
9. A test procedure indicating the proposed test date shall be prepared. The test procedure for each such test shall describe the test to be performed, the applicable equipment item being tested, the method and standards for testing, and certification of the testing facility's capabilities. Successful completion of such test shall be a precondition to shipment.
10. All test procedures shall be available for review by the General Manager.
11. General Manager has the option to review and schedule inspection HOLD points.
12. General Manager shall be notified in writing at least 14 days prior to a shop test or independent inspection HOLD point. Notification shall include the date and place at which the equipment item shall reach the mandatory hold point.
13. Unless the General Manager advises the BOP Contractor not to proceed with the inspection and testing five working days in advance of the date at which the BOP Contractor has stated in the notice, the BOP Contractor may proceed with the activity. Any results shall be deemed to have been made in the General Manager's presence, and the BOP Contractor shall forthwith forward to the General Manager duly certified copies of the results.
14. BOP Contractor shall give (and cause third parties to give) any representative, designated by the General Manager, full cooperation and assistance in any factory inspection at the premises of BOP Contractor or any other place of manufacture of items supplied hereunder (or components thereof).

PART 3 - EXECUTION

3.1 SPARE PARTS

A. Erection and Commissioning Spare Parts

1. BOP Contractor shall furnish and deliver all Erection and Commissioning Spare Parts recommended to be stocked during construction, hydrotesting, flushing, start-up, initial operation, and performance testing of all BOP Contractor supplied equipment and components. These spare parts are to be packaged separately from the equipment and shipped along with the equipment. BOP Contractor shall clearly identify all Erection and Commissioning Spare Parts as such. In addition, a tag shall be securely attached to each part and shall show the following information:

    a. Equipment name
    b. Part name
    c. Drawing reference and part item number

2. BOP Contractor shall submit a list of all Erection & Commissioning Spare Parts that will be furnished as a part of this contract. Erection and Commissioning Spare Parts List shall include the following information as a minimum.

    a. Spare part name, description, and part or catalog number
    b. Recommended quantity per unit
    c. Expected shelf life
    d. Manufacturing lead time

3. Erection and commissioning spare parts are to be shipped with the equipment.

B. Operation Spare Parts

1. BOP Contractor shall recommend parts which should be stocked as a normal complement of spare parts for one (1) year and three (3) years of normal operation of the plant for all BOP Contractor supplied equipment and components. BOP Contractor's recommendation for spare parts stock levels should take into consideration lead time for delivery of replacement parts after order, design life of part, wear out rate of part or similar pieces of equipment, and operating conditions to which the equipment will be subjected.
2. BOP Contractor's recommended Spare Parts List(s) shall include the following information, as a minimum:

    a. Spare part name, description, and part or catalog number
    b. Recommended quantity per unit
    c. Expected shelf life
    d. Manufacturing lead time
    e. Pricing valid for 12 months from time Spare Parts List is issued by BOP Contractor to the General Manager plus optional delivery price to the Job Site.

3.2 FIELD QUALITY CONTROL

A. Tests

1. Field Acceptance Tests: In the event that the plant does not meet performance guarantees, the BOP Contractor will test individual plant components as required to locate the deficient equipment.
2. The entire expense of the field tests required indicating the effect of such deficiencies and remedial alteration and modifications shall be borne by the BOP Contractor. The “entire expense” shall be interpreted as all expenses incurred during the field testing other than the normal operating staff of the General Manager.
3. Following erection/installation of equipment, BOP Contractor shall test equipment in the installed condition to verify the equipment’s ability to operate under the specified conditions and to meet the specified performance guarantees.
4. General Manager shall be notified of this BOP Contractor performed performance testing, and shall be permitted to witness this testing, if desired.
5. Certified copies of test results shall be submitted for acceptance by the General Manager before shipment of the equipment is made.

PART 4 - ATTACHMENTS

4.1 TECHNICAL DATASHEETS BY GENERAL MANAGER

PROJECT

Project Number	123374
Project Name	Glenarm Repowering Project (GT-5 Combined Cycle Installation)
Client	Pasadena Water and Power
Location	Pasadena, CA
Service	Steam and Water sampling

DESIGN DATA

Plant Configuration	1 x 1 Combined Cycle			
Equipment Location	☒ Indoor			☐ Outdoor
Design Life (years)	30			
Allowable Noise (dBA)	Refer to Section 480031, Combined Cycle Noise Control Performance			
Power Supply Available	120V/1PH/60Hz, 480V/3PH/60Hz			
Seismic Criteria	Refer to Section 480020, Site Conditions			
Physical Dimensions (ft)	L _____	W _____	H _____	Shipping Weight (lbs): _____
Acoustic Enclosure	☒ Yes			☐ No
Paint (Manufacturer's Std)	☒ Yes			☐ No
Remarks				

TESTING

Performance Test	☒ Yes	☐ No	Witnessed:	☐ Yes	☒ No
Remarks					

4.2 TECHNICAL DATASHEETS BY BOP CONTRACTOR

Item	Sampling System Component Description/Data	
1.1	**Sample Panel, Wet Section/Dry Section**	
	Overall size: (L x H x D) mm	
	Wet Section:	
	Size: (L x H x D) mm	
	Panel Front: (Full or Partial)	
	Back, Sides, Top: (Open or Closed)	
	NEMA Rating:	
	Materials of Construction:	
	Front Panel:(Gauge or Thickness)	
	Side Panel(s), Roof: (Gauge or Thickness)	
	Rear Door Quantity:	
	Rear Door(s): (Gauge)	
	Base Construction:	
	Frame Construction:	
	Paint:	
	Special Construction Features:	
	Dry Section:	
	Size: (L x H x D) mm	
	NEMA Rating:	
	Materials of Construction:	
	Front Panel: (Gauge or Thickness)	
	Side Panel(s), Roof (Gauge or Thickness)	
	Rear Door Quantity:	
	Rear Door(s) (Gauge)	
	Base Construction:	
	Frame Construction:	
	Paint:	
	Special Construction Features:	
1.2	**Sample Sink**	
	Size: (L x H x D) mm	
	Material of Construction (including Gauge):	
	Mounting: (Recessed or Surface Mounted)	
	Work Shelf Depth:	
1.3	**Sample Inlet Bulkhead Connectors**	
	Quantity:	
	Size:	
	Material:	
	Connection Type: (Tube Connection/Socket Weld)	

Item	Sampling System Component Description/Data	
1.4	**Sample Inlet Valves**	
	Quantity:	
	Manufacturer/Model:	
	Size:	
	Material:	
	Connection Type: (Tube Compression/Socket Weld)	
1.5	**Sample Blowdown Valves**	
	Quantity:	
	Manufacturer/Model:	
	Size:	
	Material:	
	Connections Type: (Tube Compression/Socket Weld)	
1.6	**Sample Blowdown Header**	
	Size:	
	Material:	
	Fitting Rating:	
	Connections:	
1.7	**Primary Sample Coolers**	
	Quantity:	
	Manufacturer/Model:	
	Shell Material:	
	Tube Material:	
	Square Foot Capacity:	
	Total Cooling Water Requirements:	
	Pressure Drop Across Cooling Water Headers	
1.8	**Primary Sample Cooler Cooling Water Inlet Valves**	
	Quantity:	
	Manufacturer/Model:	
	Size:	
	Type:	
	Material:	
	Connections:	
1.9	**Primary Sample Cooler Cooling Water Outlet Valves**	
	Quantity:	
	Manufacturer/Model:	
	Size:	
	Type:	
	Material:	
	Connections:	

Item	Sampling System Component Description/Data	
1.10	**Primary Sample Cooler Cooling Water Thermal/Pressure Relief Valves**	
	Quantity:	
	Manufacturer/Model:	
	Size:	
	Material:	
	Connections:	
	Relief Valve Setting:	
	Temperature Setting:	
1.11	**Primary Sample Cooler Cooling Water Supply Piping**	
	Size:	
	Material:	
	Connections:	
	Cooling Water Supply Max Design Temperature:	
	Special Features:	
1.12	**Primary Sample Cooler Cooling Water Return Piping**	
	Size:	
	Material:	
	Fittings:	
	Connections:	
	Special Features:	
1.13	**In-Line Sample Filters**	
	Quantity:	
	Manufacturer/Model:	
	Material:	
	Type:	
1.14	**High Pressure Reducing Valves**	
	Quantity:	
	Manufacturer/Model:	
	Size:	
	Material:	
	Connections:	
1.15	**Sample Pressure Reducing Valves**	
	Quantity:	
	Manufacturer/Model:	
	Size:	
	Material:	
	Connections	

Item	Sampling System Component Description/Data	
1.16	**Sample Pressure Regulators**	
	Quantity:	
	Manufacturer/Model:	
	Material:	
	Connections:	
1.17	**Sample Pressure Relief Valves**	
	Quantity:	
	Manufacturer/Model:	
	Material:	
	Connections:	
	Relief Valve Setting:	
1.18	**High Sample Temperature Shutoff Valve**	
	Quantity:	
	Manufacturer/Model:	
	Set Point Range:	
	NEMA Rating:	
	Thermocouple Type:	
	Alarm Contacts:	
	Reset Switch: (Automatic, Manual)	
	Indicator Type: (Digital, Analog)	
1.28	**Sample Pressure Indicators**	
	Quantity:	
	Manufacturer/Model:	
	Range:	
	Material:	
	Dial Size:	
	Isolation Valve: (Yes/No)	
	Isolation Valve Type:	
1.29	**Sample Temperature Indicators**	
	Quantity:	
	Manufacturer/Model:	
	Range:	
	Material:	
	Dial Size:	
	Thermowell (Yes/No)	
1.30	**Sample Sequencing Solenoid Valves**	
	Quantity:	
	Manufacturer/Model	
	Type: (Two or Three-way)	
	Size:	

Item	Sampling System Component Description/Data	
	Pressure Rating:	
	Connections:	
	Material:	
	Voltage:	
	Coil NEMA Rating:	
	Coil Temperature Class: ("F" or "H")	
1.31	**Sample Sequencing Solenoid Isolation Valves**	
	Quantity:	
	Manufacturer/Model	
	Size:	
	Type:	
	Material:	
	Connections:	
1.32	**Sample Backpressure Valves**	
	Quantity:	
	Manufacturer/Model:	
	Material:	
	Connections:	
	Adjustable Handle (Yes/No)	
1.35	**Analyzer Rotameters**	
	Quantity:	
	Manufacturer/Model:	
	Flow Range:	
	Body Material:	
	End Connection Material:	
	Scale Size:	
	Integral Needle Valve (Yes/No)	
	Mounting Bezel (Yes/No)	
1.36	**Total Flow Sample Rotameters**	
	Quantity:	
	Manufacturer/Model:	
	Flow Range:	
	Body Material:	
	End Connection Material:	
	Scale Size:	
	Integral Needle Valve (Yes/No)	
	Mounting Bezel (Yes/No)	
1.37	**Grab Sample Valves**	
	Quantity:	
	Manufacturer/Model:	

Item	Sampling System Component Description/Data	
	Size:	
	Material:	
	Connections:	
1.38	**Waste Drain Piping**	
	Size:	
	Material:	
	Fittings:	
	Connections:	
1.39	**Sample Tubing**	
	Size:	
	Material:	
	Wall Thickness:	
	Type:	
	Insulation (Yes/No)	
	Insulation Type:	
1.40	**Sample Tube Fittings**	
	Manufacturer:	
	Material:	
	Connections:	
1.41	**pH Sensors**	
	Quantity:	
	Manufacturer/Model:	
	Material:	
	Range:	
	Type:	
	Pre Amplifier (Yes/No)	
	Automatic Temperature Compensation (Yes/No)	
	Flow Through Housing Material:	
	High Purity Type: (Yes/No)	
1.42	**High Purity pH Sensors**	
	Quantity:	
	Manufacturer/Model:	
	Material:	
	Range:	
	Type:	
	Pre Amplifier (Yes/No)	
	Automatic Temperature Compensation (Yes/No)	
	Flow Through Housing Material:	
	High Purity Type: (Yes/No)	

Item	Sampling System Component Description/Data	
1.43	**Specific Conductivity Sensors**	
	Quantity:	
	Manufacturer/Model:	
	Cell Constant:	
	Range:	
	Material:	
	Automatic Temperature Compensation (Yes/No)	
	Flow Through Housing Material:	
1.44	**Cation Conductivity Sensor**	
	Quantity:	
	Manufacturer/Model:	
	Cell Constant:	
	Range:	
	Material:	
	Automatic Temperature Compensation (Yes/No)	
	Flow Through Housing Material:	
1.45	**Cation Exchange Columns**	
	Quantity:	
	Manufacturer/Model:	
	Replaceable Resin: (Yes/No)	
1.46	**pH Monitors**	
	Quantity:	
	Manufacturer/Model:	
	Channels:(Single or Dual)	
	Range:	
	Output:	
	Automatic Temperature Compensation (Yes/No)	
	Alarms (Yes/No)	
	Digital Indicator (Yes/No)	
	Display (LED or LCD)	
1.47	**Specific Conductivity Monitors**	
	Quantity:	
	Manufacturer/Model:	
	Channels: (Single or Dual)	
	Range:	
	Output:	
	Automatic Temperature Compensation (Yes/No)	
	Alarms (Yes/No)	
	Digital Indicator (Yes/No)	
	Display (LED or LCD)	

Item	Sampling System Component Description/Data	
1.48	**Cation Conductivity Monitors**	
	Quantity:	
	Manufacturer/Model:	
	Channels: (Single or Dual)	
	Range:	
	Output:	
	Automatic Temperature Compensation (Yes/No)	
	Alarms (Yes/No)	
	Digital Indicator (Yes/No)	
	Display (LED or LCD)	
1.49	**Degassed Cation Conductivity Monitors**	
	Quantity:	
	Manufacturer/Model:	
	Channels: (Single or Dual)	
	Range:	
	Output:	
	Automatic Temperature Compensation (Yes/No)	
	Alarms (Yes/No)	
	Digital Indicator (Yes/No)	
	Display (LED or LCD)	
1.50	**Sodium Analyzer(s)**	
	Quantity:	
	Manufacturer/Model:	
	Channels:	
	Range:	
	Output:	
	Digital Indicator (Yes/No)	
	Display (LED or LCD)	
	Alarms (Yes/No)	
	Calibration Kit (Yes/No)	
	Startup Reagents (Yes/No)	
	12 Month Reagent Kit (Yes/No)	
	Mounting: (Surface or Flush)	
	Special Features:	
1.51	**Dissolved Oxygen Analyzer(s)**	
	Quantity:	
	Manufacturer/Model:	
	Range:	
	Output:	
	Digital Indicator (Yes/No)	
	Display (LED or LCD)	

Item	Sampling System Component Description/Data	
	Alarms (Yes/No)	
	Mounting: (Surface or Flush)	
	Special Features:	
1.52	**Silica Analyzer(s)**	
	Quantity:	
	Manufacturer/Model:	
	Channels:	
	Range:	
	Output:	
	Digital Indicator (Yes/No)	
	Display (LED or LCD)	
	Alarms (Yes/No)	
	Startup Reagents (Yes/No)	
	12 Months Reagents (Yes/No)	
	Mounting: (Surface or Flush)	
	Special Features:	
1.55	**Terminal Blocks**	
	Manufacturer/Model:	
1.56	**Control Wire**	
	Type:	
1.57	**Instrumentation/Sensor Wire**	
	Type:	
1.58	**Nameplates**	
	Mounting Method (Adhesive or SS Screws)	
1.59	**Wire Raceway**	
	Type:	
1.60	**Grounding Bus Bar**	
	Included (Yes/No)	
1.61	**Duplex Power Receptacle**	
	Quantity:	
	Type: (General Purpose or GFI)	
	Mounting Location:	
1.62	**Lighting Fixtures**	
	Quantity:	
	Type: (Incandescent or Fluorescent)	
	Mounting Location:	

SECTION 485951.80
STEAM AND WATER SAMPLE PANEL

NOTES

Note 1: BOP Contractor to complete all missing information.

Enclosure 8

Jumper Tube Installation Proposal

Date:	November 27, 2013
Customer Reference:	Glenarm Repowering – Jumper tube installation
IST Reference:	P12079-00 Jumper Tubes

To the BOP contractor bidding the construction of the Glenarm Repowering Project:

The following estimate is based on working a 6 x 10-hr/dy workweek Monday through Saturday, with Sunday as a scheduled off-day. Two (2) travel days (one in & one out) have also been included for all three (3) IST personnel. If additional weekend work or overtime is required, additional charges will be invoiced per the IST standard rate sheet, based on the approved signed time sheets from site. No stat-holiday period work time has been accounted for in this quotation. Any unforeseeable circumstances beyond our control causing delays will be charged based on the standard rate sheet, in accordance with the signed timesheets.

No allowance has been given for time on site for hydrostatic testing after the jumper tube welding is completed, as the external pipe welding to each unit cannot commence until after the tube welding is completed. Therefore it is presumed that this testing will be performed at a later date. IST representation for the witness of the final Sect-1 hydrostatic test that includes the boiler external piping is presumed to be performed at a later visit (which is not included in this pricing). Test plugs for steam and feedwater headers can be made available for shipment with the tools, and a pneumatic test can be performed on the site jumper welds prior to IST personnel's departure from site.

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IST field service scope <u>included</u> in this proposal:

- Removal and reinstatement (if required) of any restraint assemblies, end-seal floors, or other OTSG components necessary to provide access to the press-part working area.
- Installation and welding of (41) jumper tube assemblies per OTSG Unit, totaling 123 x 1.25"-diameter welds, and 41 x ½"-diameter welds per boiler. All tube welding will be performed using an automatic 'tig' orbital welding process.
- Installation of 41-each per boiler, packing-gland seal bushings at the lower SCR catalyst rear floor jumper-tube penetrations.
- Engineering and administration time for the implementation of the above scope.
- All IST personnel travel & labour time, air & ground transportation costs, and subsistence for two weeks.
- Packing and shipment (return) of tools and equipment to implement the installation.
- Consumables, excluding argon gas.
- Preparation of job Quality Package including ASME Section I Data Report Forms, for submission and review by the local Authorized Inspector in the jurisdiction.

IST personnel will come prepared with all the tools necessary to execute the internal jumper tube pressure-part work, but will require some logistical support from the customer and their contractor personnel during the execution. To clarify responsibilities required by the customer / contractor for support provisions, please note the following:

Customer's Scope:

In order to accomplish the necessary tasks it will be necessary for the customer to provide the following:

1. Provision of electric power for IST portable transformers requiring 480V, 30 Amp service to support operation of orbital welding units and electric tools.
2. Electrician for initial hook up and disconnect. (3 hrs total est'd)
3. Provision of compressed air for use of hand operated pneumatic milling tools.
4. Provision of argon gas; estimated requirement is (1) x 12 bottle - manifold pack, plus four (4) individual loose bottles of 2300 psi argon per boiler.
5. Availability of a propane tank (if req'd), in the event feedwater header lines require to be tag torched dry, if evidence of moisture is apparent.
6. Site safety induction of IST personnel.
7. Designated dry laydown area for IST tool crate in close proximity to the OTSG's (preferably beneath the inlet plenum).
8. Disposal container for miscellaneous refuse (if req'd).
9. Provision of air quality testing for confined space prior to access into unit.
10. Provision of safety door watch personnel throughout the work period.
11. Provision of (2) x supplemental workers (boilermaker or similar trades designation) for support setting-up equipment and providing mechanical/trades support throughout the job as the need dictates.
12. Access to lunchroom and toilette facilities for on-site personnel.
13. Provision of off-loading capabilities for equipment arriving at site.
14. Provision of scaffolding/platforms as required for access to all internal working area levels where orbital welding is to be completed.
15. Provision of external scaffolding access at feedwater inlet box if platform access is not in place. This is required to access the HP feedwater inlet header and flex tubes.
16. All rear internal joint kits in the proximity of the jumper tube installation must be in place prior to the welding technicians arrival on site.
17. Provision of on-site permits and safe lock-out of any relevant equipment.

For hydrostatic testing activities at a later point in time, and not included in this price, following the completion of jumper-tube welding and boiler external piping, the customer / contractor will be responsible for the following:

a) Supply of ample demineralized water and pressurizing equipment to perform a hydrostatic test of the steam generator(s) once installation is complete.
b) Any temporary boiler internal propane heating (if req'd-seasonal), to raise feedwater and tubing temperature to the acceptable code level of 21°C.
c) Coordination with and contracting of local AI in the jurisdiction.

Estimated cost for the above work is $75,000 CAD

Best Regards,

Richard Welk,
Field Service Technical Advisor

Enclosure 9

123374 Pasadena OE

Project Deliverables List

Report Date *March 14, 2014*

Document No.	Engineering Discipline	Document Title	Current Rev. Date	Current Rev. No.	Released
081113	ARCHITECTURAL	HOLLOW METAL DOORS AND FRAMES	10-Oct-13	A	SPEC
083323	ARCHITECTURAL	OVERHEAD COILING DOORS	10-Oct-13	A	SPEC
087100	ARCHITECTURAL	DOOR HARDWARE	10-Oct-13	A	SPEC
092900	ARCHITECTURAL	GYPSUM BOARD	10-Oct-13	A	SPEC
093100	ARCHITECTURAL	CERAMIC TILE	10-Oct-13	A	SPEC
095113	ARCHITECTURAL	ACOUSTICAL PANEL CEILINGS	10-Oct-13	A	SPEC
096513	ARCHITECTURAL	RESILIENT BASE AND ACCESSORIES	10-Oct-13	A	SPEC
096519	ARCHITECTURAL	RESILIENT TILE FLOORING	10-Oct-13	A	SPEC
096723	ARCHITECTURAL	RESINOUS FLOOR COATING	10-Oct-13	A	SPEC
096900	ARCHITECTURAL	ACCESS FLOORING	10-Oct-13	A	SPEC
099123	ARCHITECTURAL	INTERIOR PAINTING	10-Oct-13	A	SPEC
102113	ARCHITECTURAL	TOILET COMPARTMENTS	10-Oct-13	A	SPEC
102800	ARCHITECTURAL	TOILET ACCESSORIES	10-Oct-13	A	SPEC
105113	ARCHITECTURAL	METAL LOCKERS	10-Oct-13	A	SPEC
123200	ARCHITECTURAL	MANUFACTURED WOOD CASEWORK	10-Oct-13	A	SPEC
123553	ARCHITECTURAL	LABORATORY CASEWORK	10-Oct-13	A	SPEC
133419	ARCHITECTURAL	METAL BLDG SYS SINGLE METAL PANELS WALLS AND ROOF	10-Oct-13	A	SPEC
260000	ELECTRICAL	ELECTRICAL-MECHANICAL EQUIPMENT	10-Sep-13	D	SPEC
260533	ELECTRICAL	NON-SEG BUS SPECIFICATION	9-Sep-13	A	SPEC
261200.2	ELECTRICAL	MEDIUM VOLTAGE AUXILIARY TRANSFORMERS SPECIFICATION	9-Sep-13	B	SPEC
262050	ELECTRICAL	LOW VOLTAGE MOTORS	10-Sep-13	C	SPEC
262600	ELECTRICAL	POWER DISTRIBUTION CENTER (PDC) SPECIFICATION	9-Sep-13	B	SPEC
262600	ELECTRICAL	PDC SPECIFICATION	9-Sep-13	B	SPEC
263323.1	ELECTRICAL	125VDC BATTERY SYSTEM SPECIFICATION	9-Sep-13	B	SPEC
262323.2	ELECTRICAL	24VDC BATTERY SYSTEM SPECIFICATION	6-Sep-13	A	SPEC
480020	ALL	PASADENA SITE CONDITIONS	20-Feb-14	K	SPEC
480033	ALL	NOISE CONTROL PERFORMANCE	10-Dec-13	B	SPEC
480032.1	-	BALANCE OF PLANT CONTRACTOR PERFORMANCE TESTING	21-Oct-13	A	SPEC
485072	MECHANICAL	COATING OF PIPING AND TANKS	9-Sep-13	A	SPEC
485080	MECHANICAL	PIPING AND EQUIP INSULATION	18-Sep-13	A	SPEC
485090	MECHANICAL	CATHODIC PROTECTION	9-Sep-13	A	SPEC
485100.01	MECHANICAL	PIPE MATERIAL SPECIFICATIONS	18-Oct-13	Various	SPEC
485100.03	MECHANICAL	VALVE MATERIAL SPECIFICATIONS	27-Sep-13	Various	SPEC
485121	MECHANICAL	GENERAL SERVICE CONTROL VALVES	15-Jul-13	A	SPEC
485172	MECHANICAL	FIELD FABRICATED TANKS - STEEL SPECIFICATION	15-Jul-13	A	SPEC
485173	MECHANICAL	SHOP FABRICATED TANKS SPECIFICATION	10-Dec-13	C	SPEC
485311.10	MECHANICAL	HORIZONTAL CENTRIFUGAL PUMPS – GENERAL SERVICE SPECIFICATION	10-Dec-13	C	SPEC
485325.11	MECHANICAL	AMMONIA FORWARDING PUMP SKID SPECIFICATION	26-Jul-13	A	SPEC
485422	MECHANICAL	SHELL AND TUBE HEAT EXCHANGER	9-Dec-13	B	SPEC
485951.80	MECHANICAL	STEAM AND WATER SAMPLE PANEL	12-Mar-14	A	ADD 5
485951.96	MECHANICAL	POTABLE WATER SYSTEM PUMP SKID	9-Dec-13	B	SPEC
485952.05	MECHANICAL	CHEMICAL FEED SYSTEM - COOLING TOWER	14-Oct-13	B	SPEC
485952.06	MECHANICAL	CHEMICAL FEED SYSTEMS - STEAM GENERATOR	14-Oct-13	B	SPEC
485956	MECHANICAL	FIRE PREVENTION AND PROTECTION SYSTEM	30-Jan-14	C	ADD 3
489596	MECHANICAL	FIRE ALARM AND SIGNALING SYSTEMS	29-Aug-13	A	SPEC
485956.30	MECHANICAL	FIRE WATER SPRINKLER SYSTEM	9-Aug-13	A	SPEC
037-1758	ALL	SOIL EXCAVATION VOLUMES	18-Aug-11	A	SPEC
037-5033	ALL	PASADENA GT-5 DESIGN CRITERIA	17-Dec-13	D	SPEC
037-4780	CONTROLS	PCS/CONTROL SYSTEM SPECIFICATION	10-Dec-13	B	SPEC
037-5056	ARCHITECTURAL	ARCHITECTURAL SCOPE OF WORK	23-Oct-13	B	SPEC
261300-1	ELECTRICAL	15KV SWITCHGEAR SPECIFICATION	10-Oct-13	B	SPEC
261300-2	ELECTRICAL	5KV SWITCHGEAR SPECIFICATION	10-Oct-13	B	SPEC
263323-2	ELECTRICAL	24VDC BATTERY SYSTEM SPECIFICATION	9-Sep-13	A	SPEC
A1-2-1	ARCHITECTURAL	CONTROL BUILDING MAIN FLOOR PLAN	10-Oct-13	D	SPEC

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Project Deliverables List

Report Date *March 14, 2014*

Document No.	Engineering Discipline	Document Title	Current Rev. Date	Current Rev. No.	Released
A1-3-1	ARCHITECTURAL	CONTROL BUILDING EXTERIOR ELEVATIONS	10-Oct-13	D	SPEC
A1-9-1	ARCHITECTURAL	CONTROL BUILDING & WATER LAB ROOM FINISH, DOOR AND WINDOW SCHEDULES	10-Oct-13	D	SPEC
A1-9-2	ARCHITECTURAL	CONTROL BUILDING & WATER LAB DOOR AND WINDOW DETAILS	10-Oct-13	D	SPEC
A2-1-1	ARCHITECTURAL	ROOF DEMOLITION PLAN	24-Sep-13	C	SPEC
A2-1A	ARCHITECTURAL	WELDING SHOP FLOOR PLAN	16-Jul-13	A	SPEC
A2-2-1	ARCHITECTURAL	MAINTENANCE SHOP MAIN FLOOR PLAN	10-Oct-13	D	SPEC
A2-2-2	ARCHITECTURAL	MAINTENANCE SHOP MEZZANINE	24-Sep-13	C	SPEC
A2-3-1	ARCHITECTURAL	MAINTENANCE SHOP EXTERIOR ELEVATIONS	24-Sep-13	C	SPEC
A2-4-1	ARCHITECTURAL	MAINTENANCE SHOP SECTIONS	10-Oct-13	D	SPEC
A2-5-1	ARCHITECTURAL	MAINTENANCE SHOP DETAILED PLANS	10-Oct-13	D	SPEC
A2-9-1	ARCHITECTURAL	ROOM DOOR FINISH SCHEDULES	10-Oct-13	D	SPEC
A3-1	ARCHITECTURAL	CONTROL BUILDING EXTERIOR ELEVATIONS	27-Mar-13	B	SPEC
A3-2-1	ARCHITECTURAL	WELDING SHOP FLOOR PLAN	24-Sep-13	C	SPEC
A3-3-1	ARCHITECTURAL	WELDING SHOP EXTERIOR ELEVATIONS	24-Sep-13	C	SPEC
A4-1	ARCHITECTURAL	CONTROL BUILDING & WATER LAB BUILDING SECTIONS	10-Oct-13	D	SPEC
A4-2-1	ARCHITECTURAL	WATER LABORATORY FLOOR PLAN	10-Oct-13	D	SPEC
A4-3-1	ARCHITECTURAL	WATER LABORATORY EXTERIOR ELEVATIONS	24-Sep-13	C	SPEC
C1-3	CIVIL	PRELIMINARY SITE PLAN LM6000 CONFIGURATION	17-Jan-14	L	SPEC
C3-1	CIVIL	PRELIMINARY GRADING & DRAINAGE PLAN GAS TURBINE/AXIAL EXHAUST	17-Jan-14	G	SPEC
C3-3	CIVIL	PRELIMINARY SITE SURFACING PLAN GAS TURBINE/AXIAL EXHAUST	17-Jan-14	B	SPEC
C3-4	CIVIL	CONSTRUCTION PARKING, LAYDOWN, STAGING AND ACCESS PLAN	2-Oct-13	B	SPEC
C3-5	CIVIL	PRELIMINARY SITE DETAILS GAS TURBINE/AXIAL EXHAUST	7-Oct-13	A	SPEC
CSK-1	CIVIL	BOREHOLE LOCATION PLAN	29-Apr-11	B	SPEC
E1-1A	ELECTRICAL	ELECTRICAL OVERALL CONCEPTUAL ONE-LINE DIAGRAM (LM 6000)	7-Jan-14	G	ADD 2
E1-2	ELECTRICAL	ELECTRICAL OVERALL CONCEPTUAL PDC BUILDING LAYOUT	10-Dec-13	E	ADD 2
E6-1	ELECTRICAL	ELECTRICAL UNDERGROUND NOTES AND LEGEND	4-Oct-13	A	SPEC
E6-10	ELECTRICAL	PROPOSED ELECTRICAL UNDERGROUND ROUTING	7-Jan-14	C	ADD 4
I1-1	CONTROLS	PLANT CONTROL SYSTEM ARCHITECTURE	30-Aug-13	A	SPEC
I1-2	CONTROLS	CONTROL ROOM WORKSTATIONS	30-Aug-13	A	SPEC
M1-1-1	MECHANICAL	GENERAL ARRANGEMENT GAS TURBINE/AXIAL EXHAUST	3-Jan-14	L	ADD 2
M1-1-6	MECHANICAL	TIE POINT DRAWING GAS TURBINE/AXIAL EXHAUST	3-Jan-14	E	ADD 2
M2-2-1	MECHANICAL	PROCESS FLOW DIAGRAM WATER BALANCE (W/ INLET CHILLING)	28-Feb-12	D	SPEC
M2-2-4	MECHANICAL	GLENARM INDUSTRIAL WASTEWATER	9-May-12	B	SPEC
M3-1-0	MECHANICAL	P&ID-COVER SHEET	15-Oct-13	E	SPEC
M3-10-1	MECHANICAL	P&ID-GLAND STEAM SYSTEM	6-Dec-13	E	SPEC
M3-1-1	MECHANICAL	P&ID - SYMBOLS AND LEGEND	15-Oct-13	C	SPEC
M3-11-1	MECHANICAL	P&ID-CONDENSATE SYSTEM	30-Jan-14	H	SPEC
M3-11-2	MECHANICAL	P&ID-CONDENSATE SYSTEM	30-Jan-14	H	SPEC
M3-11-3	MECHANICAL	P&ID-CONDENSATE SYSTEM	6-Dec-13	G	SPEC
M3-1-2	MECHANICAL	P&ID - SYMBOLS AND LEGEND	8-Oct-12	A	SPEC
M3-12-1	MECHANICAL	P&ID-CONDENSER AIR EXTRACTION	29-Nov-13	F	SPEC
M3-1-3	MECHANICAL	P&ID - SYMBOLS AND LEGEND	15-Oct-13	B	SPEC
M3-13-1	MECHANICAL	P&ID-CIRCULATING WATER SYSTEM	30-Jan-14	H	SPEC
M3-14-1	MECHANICAL	P&ID-AUXILIARY COOLING WATER SYSTEM	6-Dec-13	F	SPEC
M3-15-1	MECHANICAL	P&ID-COMPONENT COOLING WATER SYSTEM	15-Oct-13	D	SPEC
M3-15-2	MECHANICAL	P&ID-COMPONENT COOLING WATER SYSTEM	15-Oct-13	D	SPEC
M3-15-3	MECHANICAL	P&ID-COMPONENT COOLING WATER SYSTEM	15-Oct-13	E	SPEC
M3-16-1	MECHANICAL	P&ID-COOLING TOWER CHEMICAL FEED SYSTEM	13-Sep-13	D	SPEC
M3-17-1	MECHANICAL	P&ID-AQUEOUS AMMONIA SYSTEM	6-Dec-13	G	SPEC
M3-18-1	MECHANICAL	P&ID-FUEL GAS SYSTEM	6-Dec-13	G	SPEC
M3-18-2	MECHANICAL	P&ID-FUEL GAS SYSTEM	6-Dec-13	G	SPEC
M3-18-3	MECHANICAL	P&ID-FUEL GAS SYSTEM	15-Oct-13	B	SPEC
M3-19-1	MECHANICAL	P&ID-SERVICE AIR SYSTEM	15-Oct-13	E	SPEC
M3-20-1	MECHANICAL	P&ID-INSTRUMENT AIR SYSTEM	13-Sep-13	D	SPEC
M3-2-1	MECHANICAL	P&ID-GAS TURBINE INTERCONNECTIONS	15-Oct-13	E	SPEC
M3-21-1	MECHANICAL	P&ID-FIREWATER SYSTEM	15-Oct-13	D	SPEC

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Project Deliverables List

Report Date *March 14, 2014*

Document No.	Engineering Discipline	Document Title	Current Rev. Date	Current Rev. No.	Released
M3-22-1	MECHANICAL	P&ID-SERVICE WATER SYSTEM	15-Oct-13	E	SPEC
M3-23-1	MECHANICAL	P&ID-DEMINERALIZED WATER SYSTEM	15-Oct-13	E	SPEC
M3-23-2	MECHANICAL	P&ID-DEMINERALIZED WATER SYSTEM	15-Oct-13	C	SPEC
M3-24-1	MECHANICAL	P&ID-POTABLE WATER SYSTEM	15-Oct-13	E	SPEC
M3-25-1	MECHANICAL	P&ID-CHILLED WATER SYSTEM	20-Feb-14	H	SPEC
M3-25-2	MECHANICAL	P&ID-CHILLED WATER SYSTEM	30-Jan-14	G	SPEC
M3-26-1	MECHANICAL	P&ID-WASTEWATER COLLECTION SYSTEM	15-Oct-13	E	SPEC
M3-26-2	MECHANICAL	P&ID-WASTEWATER COLLECTION SYSTEM	15-Oct-13	D	SPEC
M3-27-1	MECHANICAL	P&ID-AUXILIARY STEAM SYSTEM	15-Oct-13	C	SPEC
M3-3-1	MECHANICAL	P&ID-OTSG INTERCONNECTIONS (EXHAUST GAS)	6-Dec-13	G	SPEC
M3-3-2	MECHANICAL	P&ID-OTSG INTERCONNECTIONS (STEAM)	30-Jan-14	H	SPEC
M3-4-1	MECHANICAL	P&ID-BOILER FEEDWATER SYSTEM	6-Dec-13	G	SPEC
M3-5-1	MECHANICAL	P&ID-HIGH PRESSURE STEAM	6-Dec-13	E	SPEC
M3-6-1	MECHANICAL	P&ID-STEAM TURBINE INTERCONNECTIONS	6-Dec-13	F	SPEC
M3-7-1	MECHANICAL	P&ID-STEAM DRAINS ￢ﾀﾓ DRAIN TANK	10-Dec-13	G	SPEC
M3-8-1	MECHANICAL	P&ID-STEAM AND WATER SAMPLING	15-Oct-13	D	SPEC
M3-9-1	MECHANICAL	P&ID-CYCLE CHEMICAL FEED SYSTEM	13-Sep-13	D	SPEC
M9-1	MECHANICAL	EQUIPMENT LIST	6-Dec-13	C	SPEC
M9-10	MECHANICAL	TIE-IN LIST	20-Nov-13	D	SPEC
M9-2	MECHANICAL	SERVICE INDEX	22-Nov-13	C	SPEC
SKE6-1	ELECTRICAL	EXISTING ELECTRICAL UNDERGROUND ROUTING	4-Oct-13	A	SPEC
SKE6-2	ELECTRICAL	EXISTING ELECTRICAL UNDERGROUND ROUTING	4-Oct-13	A	SPEC
SKM1-7	MECHANICAL	AMMONIA (EXISTING)	4-Dec-13	A	SPEC
SKM1-8	MECHANICAL	INTERIM/TEMPORARY CONFIGURATION	18-Dec-13	B	ADD 2
SKM1-9	MECHANICAL	FINAL CONFIGURATION	18-Dec-13	B	ADD 2

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Attachment A3-Reference Information Documents

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Document No./ Filename	Document Title	Current Rev. Date	Current Rev. No.	Released	Location
Air Compressor	Typical Drawing	10/06/08	1	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Air Compressor
260000	Elec-Mech Equip	09/10/13	D	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
261050	MV Motors	09/10/13	C	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
261200	GSU Transformer	09/10/13	G	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
262050	LV Motors	09/10/13	C	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
409413.22	CEMS	09/10/13	H	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
480020	Site Conditions	02/20/14	K	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
480031	Noise Control Perf	09/10/13	I	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
480032	Power Island Perf	09/10/13	H	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
481100	Combined Cycle PIE	09/10/13	N	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
485122.11	Steam Bypass Valves	09/10/13	E	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
485221	ST and TEWAC Generator	09/10/13	G	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
485222	GTG Aeroderivative	09/10/13	H	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
485311.10	Condensate Pumps	09/10/13	F	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
485311.20	Boiler Feedwater Pumps	09/10/13	H	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
485312	Circ Water & Aux Cooling Water Pumps	09/10/13	F	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
485374.21	Compressed Air System	09/10/13	H	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
485374.22	Fuel Gas Compressor	09/10/13	E	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
485413	OTSG Spec	09/10/13	I	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
485432	Surface Condenser	09/10/13	G	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
485471	Inlet Air Chiller	09/10/13	E	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
485491	Cooling Tower	09/10/13	F	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs
485951.8	Steam and Water Sample Panel	03/12/14	A	SPEC	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 5
485952	Condensate Polisher	08/24/12	F	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
ElectricBoiler brochure	ElectricBoiler brochure	-	11/10	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Aux Boiler Specs
ElectricBoiler Specifications	ElectricBoiler Specifications	-	11/10	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Aux Boiler Specs
ElectricBoilers Boiler Book	ElectricBoilers Boiler Book	-	11/10	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Aux Boiler Specs
CEMS	CEMS System Overview (Typical layout with optional equipment)	-	C	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\CEMS

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Attachment A3-Reference Information Documents

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Document No./ Filename	Document Title	Current Rev. Date	Current Rev. No.	Released	Location
PASADENA CHILLER GA	Chiller Module General Arrangement	09/12/12	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Chiller
969031	One Line Diagram	-	F	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Electrical Drawings
Attachment 4	Attachment 4 Scheduled Major Component RTS and Delivery Dates_GE_13Dec4	-	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Equip Delivery Sched
Gas Compressor1	Machinery Arrangement Feed Gas Compressor System	11/20/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Gas Compressor
Att 10.1 MID-TD-0000-1	Fuel Gases for Combustion in Aeroderivative Gas Turbines Sept 2009	9/2009	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GE MID TD Specs
Att 10.2 MID-TD-0000-3	Water and Steam Purity for Injection in Aero Derivative Gas Turbines June 2010	6/2010	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GE MID TD Specs
Att 10.3 MID-TD-0000-4	Compressor Cleaning for GE Aircraft Derivative Gas Turbines June 2010	6/2010	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GE MID TD Specs
Att 10.4 MID-TD-0000-5.	Liquid Detergent for GE Aircraft Aero Derivative Gas Turbines June 2010	6/2010	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GE MID TD Specs
Att 10.5 MID-TD-0000-6	Lubricating Oil Specification for GE Aircraft Aero Derivative Gas Turbines June 2010	6/2010	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GE MID TD Specs
7253049-969014	Plan & Elevation Turbine Control Panel	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls
7253049-969741	Instrument Loop Diagram Hydraulic Start System	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls
7253049-969742	Instrument Loop Diagram Ventilation & Combustion Air System	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls
7253049-969743	Instrument Loop Diagram Mineral Lube Oil System	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls
7253049-969744	Instrument Loop Diagram Turbine Lube Oil System	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls
7253049-969746	Instrument Loop Diagram Fire & Gas Protection System	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls
7253049-969750	Instrument Loop Diagram Nox Water Injections System	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls
7253049-969751	Instrument Loop Diagram Fuel System	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls
7253049-969753	Instrument Loop Diagram Water Wash System	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls
7253049-969755	Instrument Loop Diagram Auxiliary Systems	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls
7253049-969758	Instrument Loop Diagram Sprint System	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls
Pasadena CKOM -GTG Controls	LM6000 GE Aeroderivative Package	11/19/13	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls
7253049-969005	Electrical Symbols Abbreviations and Reference Data	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969006	Interconnect Plan Electrical	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969007	Interconnect Wiring Diagram Customer	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969009	Interconnect Cable Schedule	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969013	Nameplate List Engraving Schedule & Switch Development	10/09/13	A	ADD 3	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 3
7253049-969021	Plan & Elevation Generator Lineside Cubicle Cable Entry Top/Bottom	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969023	Plan & Elevation Generator Neutral Cubicle	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical

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Attachment A3-Reference Information Documents

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Document No./ Filename	Document Title	Current Rev. Date	Current Rev. No.	Released	Location
7253049-969031	One Line Diagram	10/09/13	A	ADD 4	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 4
7253049-969032	Three Line Diagram Generator Metering	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969035	Schedule Motor Control Center	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969037	System Schematic Generator Excitation	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969041	Schematic Diagram Circuit Breaker Control	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969044	Schematic Diagram Motor Control Centers	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969690	Area Classification Drawing Main Unit	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969767	Schematic Diagram DC Power Distribution	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969768	Schematic Diagram Critical Shutdown Path	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969769	Schematic Diagram Miscellaneous	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969930	Schematic Diagram Lighting & Distribution	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
7253049-969934	Schematic Diagram Communication	10/09/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
Brush_GTG_Curves	Electrical Data Sheet	10/23/13	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical
969224	Installation Footprint Anchor Bolt and Shear Lug Location	-	H	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
120E4746	General Arrangement	10/18/12	G	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
7253049-969201	General Arrangement Main Unit - LH	11/12/13	A	ADD 4	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 4
7253049-969204	General Arrangement Air Filter	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
7253049-969219	General Arrangement Auxiliary Skid Left Hand	11/11/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
7253049-969221	General Arrangement Generator / Gearbox Mineral Lube Oil Skid	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
7253049-969224	Installation Footprint Anchor Bolt and Shear Lug Location	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
7253049-969293	Piping Penetrations Option LH	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
CD19671	Air Filter GE-AEP_GSX LM6000 with Chiller Coil	02/10/12	0	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
ElectricBoiler Dimensions and ratings	ElectricBoiler Dimensions and ratings	-	11-10	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
GA 69200	GA 9 Main Unit - RH	-	H	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
GA 969209	GA Sprint Skid	-	D	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings

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Attachment A3-Reference Information Documents

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Document No./ Filename	Document Title	Current Rev. Date	Current Rev. No.	Released	Location
GA 969218	GA Auxiliary Skid Right Hand	-	H	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
GA 969221	GA Generator_Gearbox Mineral Lube Oil Skid	-	F	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
GA A0 321638800	GA Generator	07/17/12	C	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
Sample 00	ElectricBoiler sample drawing S-302-700kW @ 480V	06/08/10	00	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
SK-01	GE_STG_Sk1 - PWP Comments	11/15/12	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings
7253049-969232	Flow & Instrument Diagram Hydraulic Start System	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
7253049-969239	Flow & Instrument Diagram Ventilation & Combustion Air System	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
7253049-969244	Flow & Instrument Diagram Turbine Lube Oil System	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
7253049-969247	Flow & Instrument Diagram Turbine Hydraulic System	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
7253049-969248	Flow & Instrument Diagram Mineral Lube Oil System	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
7253049-969254	Flow & Instrument Diagram Fire & Gas Protection System	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
7253049-969260	Flow & Instrument Diagram Fuel System	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
7253049-969262	Flow & Instrument Diagram Water Wash System	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
7253049-969268	Flow & Instrument Diagram Sprint System Main Unit	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
7253049-969269	Flow & Instrument Diagram Water Injection Pump	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
7253049-969270	Flow & Instrument Diagram Sprint System Sprint Skid	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
7253049-969272	Flow & Instrument Diagram Auxiliary Systems	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
Inlet Air Chilling_Heating Conceptual Design_R3 add pre-cooler	Inlet Air Chilling_Heating Conceptual Design_R3 add pre-cooler	10/08/13	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
M005_(RG)_120E4746_SEP-12-2013	General Arrangement	09/12/13	G	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
M101_(RB)_230F5536_AUG-23-2013	Flow Diagram Steam System	08/23/13	B	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
M105 230F5512	Feedwater System	11/07/12	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams

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Document No./ Filename	Document Title	Current Rev. Date	Current Rev. No.	Released	Location
M106 203D7522 sheet 2	Condenser Terminal Points On Waterboxes	08/23/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
M106_(RA)_203D7522_AUG-23-2013	Condenser Terminal Points	08/23/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
M107_(RB)_120E4791_AUG-23-2013	Flow Diagram Circulating Water	08/23/13	B	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
M109 230F5537	Auxiliary Cooling Water System	01/28/13	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
M112_(RA)_230F5538_AUG-23-2013	Steam Drains System	08/23/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
M119 120E4734 Sheet 2	Flow Diagram Steam Turbine	08/23/13	C	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
M119_(RC)_120E4734_AUG-23-2013	Flow Diagram Steam Turbine	08/23/13	C	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
M125_(RA)_230F5539_AUG-23-2013	Condenser Air Removal System	08/23/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
M190_(RD)_230F5504_AUG-23-2013	Combined Cycle system Overview Diagram	08/23/13	D	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
M195 230F5496 sheet 2	Ammonia Dilution Heating Flow Diagram	02/07/13	B	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
M195_(RD)_230F5496_AUG-23-2013	Flow Diagram OSTG-1 Pressure	08/23/13	D	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams
7253049-969225	Lift Arrangement	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Lift and Shipping Info
7253049-969226	Shipping Data	10/16/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Lift and Shipping Info
PWP_Estimated Heaviest Lifts_Equipment Weights	PWP_Estimated Heaviest Lifts_Equipment Weights	-	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Lift and Shipping Info
7253049-000231	Flow & Equipment Symbols Mechanical	10/31/13	A	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical
Chart Only SNM Start up	Chart Only SNM Start up	04/02/12	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Performance Data
Pasadena CKOM - GT Inlet Air Conditioning	Turbine inlet Air Temperature Conditioning System	-	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Performance Data
Attachment 12	Mechanical Completion Certificate	-	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Mechanical Completion
C12079-EI RevP	ONCE THROUGH STEAM GENERATOR ERECTION & INSTALLATION INSTRUCTIONS	09/13/13	0	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\OTSG
IST Start-Up Curve	OTSG Start-Up Curve	-	-	SPEC	Attachment A3-Reference Information \A.3.A City-Supplied Power Island Equipment Info\OTSG
OTSG Erection Training - SCR-CO - Revised	OTSG INSTALLATION AND ERECTION TRAINING PRESENTATION	03/01/13	-	SPEC	Attachment A3-Reference Information \A.3.A City-Supplied Power Island Equipment Info\OTSG
Pasadena CKOM - OTSG (IST)	Glenarm Repowering Project OTSG Design	11/15/13	-	SPEC	Attachment A3-Reference Information \A.3.A City-Supplied Power Island Equipment Info\OTSG
11303-001	General Arrangement LM6000 PG OSTG	11/01/13	P1	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2

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Document No./ Filename	Document Title	Current Rev. Date	Current Rev. No.	Released	Location
Typical OTSG Erection Drawings	Typical OTSG Erection Drawings	-	-	SPEC	Attachment A3-Reference Information \A.3.A City-Supplied Power Island Equipment Info\OTSG
Attachment 6	Performance Guarantees	2013	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Performance Data
Attachment 22	LM6000PG Degradation	02/01/13	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Performance Data
GE Guarantee Heat Balances	GE Guarantee Heat Balances	02/12/13	0	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Performance Data
Attachment 1.1	Scope of Supply GTG	2013	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Scope of Supply Documents
Attachment 1.2	Scope of Supply OTSG	2013	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Scope of Supply Documents
Attachment 1.3	Scope of Supply CEMS	2013	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Scope of Supply Documents
Attachment 1.4	Scope of Supply Mechanical and Fluid	2013	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Scope of Supply Documents
Attachment 1.5	Scope of Supply Terminal Points	2013	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Scope of Supply Documents
Attachment 1.7	Scope of Supply Engineering Design	2013	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Scope of Supply Documents
Attachment 1.8	Scope of Supply Commissioning and Startup	2013	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Scope of Supply Documents
Pasadena CKOM - GE BOP Mechanical	Steam Turbine & Generator Overview	11/19/13	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\STG
STG Layout For Information Only	Steam Turbine Layout (For Information Only)	-	0	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\STG
STG_Generator Curves for Information Only	REACTIVE CAPABILITY CURVE, EFFICIENCY CURVES, SATURATION CURVES	-	0	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\STG
Attachment 23	Obligations of Site Representatives	2013	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Technical Advisors
Attachment 5.1	Typical Site Test Measurement Procedures-Test Philosophy	2013	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Testing Documents
Attachment 5.2	Typical Site Test Measurement Procedures-Standard Field Testing Procedure for Emission Compliance Based on US EPA, ISO and EN Methodology	10/2011	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Testing Documents
Attachment 5.3	Typical Site Test Measurement Procedures-SPECIFICATION FOR GAS TURBINE GENERATOR PERFORMANCE TEST MEASUREMENT (SGTGPTM) LM6000 PC / PG SAC, NATURAL GAS FUEL	-	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Testing Documents
Attachment 14.1	GTG Training Descriptions	-	2	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Training
Attachment 14.2	Training Program	2013	-	SPEC	Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Training
mitigation summary	Mitigation Summary	-	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\Air Permit
South Coast Facility Permit to Construct and Operate	South Coast Facility Permit to Construct and Operate	08/15/13	26	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\Air Permit

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Title V Facility Significant Permit Revision	Title V Facility Significant Permit Revision	08/15/13	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\Air Permit
0 TOC	Environmental Impact Report-Table Of Contents	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
0 TOC_Revised	Environmental Impact Report-TOC Revised	3/2013	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
0 Executive Summary	Environmental Impact Report-Executive Summary	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
1.0 Introduction	Environmental Impact Report-Introduction	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
1.0 Introduction_Revised	Environmental Impact Report-Introduction_Revised	3/2013	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
2.0 Project Description	Environmental Impact Report-Project Description	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
2.0 Comments and Responses on DEIR_Revised	Environmental Impact Report-Comments and Responses on DEIR_Revised	3/2013	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
3.0 Environmental Setting	Environmental Impact Report-Environmental Setting	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
3.0 Corrections and Additions_Revised_Revised	Environmental Impact Report-Corrections and Additions_Revised_Revised	3/2013	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
4.0 Mitigation Monitoring and Reporting Program	Environmental Impact Report-Mitigation Monitoring and Reporting Program	3/2013	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
4.A Aesthetics	Environmental Impact Report-Aesthetics	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
4.B Air Quality	Environmental Impact Report-Air Quality	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
4.C Cultural Resources	Environmental Impact Report-Cultural Resources	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
4.D Greenhouse Gases	Environmental Impact Report-Greenhouse Gases	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
4.E Hazards	Environmental Impact Report-Hazards	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
4.F Land Use and Planning	Environmental Impact Report-Land Use and Planning	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
4.G Noise	Environmental Impact Report-Noise	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
4.H Water Supply	Environmental Impact Report-Water Supply	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
5.0 Alternatives	Environmental Impact Report-Alternatives	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
6.0 Other Environmental Considerations	Environmental Impact Report-Other Environmental Considerations	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
7.0 Persons and Organizations	Environmental Impact Report-Persons and Organizations	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
8.0 References	Environmental Impact Report-References	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
Appendix_Table_of_Contents	Environmental Impact Report-Appendix Table of Contents	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
Appendix A_Revised	Environmental Impact Report-Appendix Table of Contents_Revised	04/15/10	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
Appendix-A_NOP-IS-Scoping Meeting Materials	Environmental Impact Report-NOP-IS-Scoping Meeting Materials	09/16/11	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA

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Appendix-B_Air Quality Assessment Files	Environmental Impact Report-Air Quality Assessment Files	11/2012	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
Appendix-C_Greenhouse Gas Impact Assessment	Environmental Impact Report-Greenhouse Gas Impact Assessment	06/15/12	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
Appendix-D.1_Figures 1-13	Environmental Impact Report-Figures 1-13	-	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
Appendix-D_Hazardous Materials	Environmental Impact Report-Hazardous Materials	07/29/11	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
Appendix-E_Noise	Environmental Impact Report-Noise	01	12/2011	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
Appendix-F_Water Supply Documentation	Environmental Impact Report-Water Supply Documentation	05/23/12	2	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA
GT 3&4 SWPPP (Draft)	GT 3&4 SWPPP (Draft)	01/31/03	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\SUSMP & SWPPP
PWP SUSMP	Stormwater Treatment Certification	02/03/03	-	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\SUSMP & SWPPP
Broadway Wastewater Permit Rev B	Broadway Wastewater Permit Rev B	07/31/12	B	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\Waste Water
Glenarm Wastewater Permit Rev C	Glenarm Wastewater Permit Rev C	07/18/13	C	SPEC	Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\Waste Water
20001-C-004-06 4-06	GSU foundation plan	12/08/03	2	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural
8-2-2368	Electrical Shop Plot Plan	10/16/69	4	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing
8-2-2369	Electrical Shop Plan & Elevations	12/08/60	3	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing
8-2-2370	Electrical Shop Mezzanine Floor Plan & Details	09/21/60	3	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing
8-2-2371	Electrical Shop Floor Plan Anchor Bolt Setting Plan	06/21/20	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing
8-2-2372	Electrical Shop Partial Deck Plan & Longitudinal Sect.	03/03/60	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing
8-2-2373	Electrical Shop Basement Plan Sections & Details	02/17/69	2	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing
8-2-2374	Electrical Shop North & Partial East Elevations & Roof Slab Over Room B1	06/21/60	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing
8-2-2375	Electrical Shop Foundation Plan for New Deck Slab Basement Ramp & Room B1 Floor Slab	02/17/69	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing
8-2-2376	Electrical Shop Reinforcing Details for Beams, Girders, Floor Slab & Ramp	06/21/60	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing
8-2-2381	Electrical Shop Architectural Floor Plan & Room Elevations	02/17/69	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing
8-2-2382	Electrical Shop Architectural Room Elevations	09/16/60	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing
8-2-2383	Electrical Shop Miscellaneous Architectural Details	09/20/60	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing

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Document No./ Filename	Document Title	Current Rev. Date	Current Rev. No.	Released	Location
8-2-2384	Electrical Construction Shop Electrical Layout	09/15/60	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing
8-2-49	Circ Pipe Tunnels Demo 2	08/02/49	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Demolition Scope
8-2-49B	Circ Pipe Tunnels Demo 3	08/02/49	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Demolition Scope
8-2-49C	Circ Pipe Tunnels Demo 4	04/27/49	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Demolition Scope
8-2-1337	Overall Tunnel Demo 1	01/02/58	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Demolition Scope
8-2-1355	Stack Foundation Demo 5	11/01/56	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Demolition Scope
8-2-1670	Plot Plan Crane Rail Demo 6	02/26/62	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Demolition Scope
SKM-1	Existing Tunnels and Proposed Equipment Overlay	06/12/13	B	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Demolition Scope
2-2-1562	Underground Fair Oaks ave.	04/22/03	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical
8-2-547	Receiving Stations and Dispatching Center Electrical Plot Plan	01/30/95	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical
8-2-575	Powerhouse to Receiving Station Section A Interconnecting Tunnel Ground System	10/14/48	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical
8-2-1341	General Arrangement of Existing Structures and Foundations	03/27/58	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical
20001E004-01	Overall conduit routing plan & sect	04/10/03	4	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical
20001E004-02	Overall conduit routing plan & sect	12/08/03	4	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical
20001E004-03	Overall conduit routing plan & sect	12/08/03	4	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical
20001E004-05	Conduit ductbank sect & misc sect	12/08/03	4	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical
20001E004-13 004-13	Conduit ductbank details-GSU hv lines	12/08/03	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical
8-2-6643, 6507, 6606, 6510, 6603, 6613 & 6602	Existing Trench and Sanitary Sewer East of Glenarm Building	-	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical
Storm Drain and Conduit Trench Drawing	Storm Drain and Conduit Trench Drawing	04/10/03	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical
V-228	UG Vault Standards	06/27/07	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical
8-2-300	Fountain Drawing	09/02/38		SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical
20001-071R0	Waste Water F & ID	11/08/02	0	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical

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Document No./ Filename	Document Title	Current Rev. Date	Current Rev. No.	Released	Location
20001-090	Flow & Instrument Diagram Ammonia System	05/19/03	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical
20001M001	Overall Site Plan GT 3 & 4	12/08/03	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical
20001P001-02	Key plan above ground and trenches	12/08/03	2	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical
20001P026-01	29% NH3 tank area above ground piping	12/08/03	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical
20001P026-02	29% NH3 tank area above ground piping	12/08/03	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical
20001-P-011-01	Piping and Plan Details Existing OWS	11/18/02	0	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical
Existing Oil-Water Separator	Existing Oil-Water Separator Manufacturer's Information	01/23/03	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical
Glenarm Parcel Map	Glenarm Parcel Map	08/09/04	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Survey Info
Glenarm Parcel Plan	Glenarm Parcel Plan	09/28/04	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Survey Info
Pasadena Glenarm Facility	Pasadena Glenarm Facility	-	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Survey Info
8-2-1002	General Location Plan	03/29/73	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Arrangement Dwgs Existing or Past
8-2-1477	Piping Arrangement	11/25/60	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Arrangement Dwgs Existing or Past
8-2-1669	Gas Equipment Building Miscellaneous Sections & Details	02/26/62	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Arrangement Dwgs Existing or Past
8-2-1670	Gas Equipment Building Plot Plan Paving & Yard Details	02/26/62	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Arrangement Dwgs Existing or Past
Site Water Utility Information	Site Water Utility Information	-	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Arrangement Dwgs Existing or Past
8-2-1355	Sootblowing Stack & Precipitator Support Foundations	11/05/56	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil
20001c002-01	Civil Key Plan Paving / Grading & U.G. Sewer PDF	12/08/03	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil
20001c002-01	Civil Key Plan Paving / Grading & U.G. Sewer CAD	12/08/03	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil
20001c002-03	Area 2 paving grading sewer	12/23/03	2	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil
20001c002-04	Area 3 paving grading sewer	12/23/03	2	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil
20001c006-04	Oily Water Separator foundation sections and details	03/06/03	0	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil
20001-c003-05	Civil Sections & Details	01/24/03	0	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil

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Document No./ Filename	Document Title	Current Rev. Date	Current Rev. No.	Released	Location
8-2-6643, 6507, 6606, 6510, 6608, 6613 & 6602	Existing Trench and Sanitary Sewer East of Glenarm Building	6/1987	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil
8-2-49	Circ Pipe Tunnels	02/06/31	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels
8-2-49B	Circ Pipe Tunnels	08/14/31	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels
8-2-49C	Circ Pipe Tunnels	08/05/31	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels
8-2-49D	Circ Pipe Tunnels	05/22/31	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels
8-2-598	Circ Pipe Tunnels	10/03/50	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels
8-2-949	Broadway to Glenarm Pipe Tunnel	12/22/65	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels
8-2-1337	Station Service Plot Plan	01/02/58	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels
20001P006-03	West end culvert piping	11/18/02	0	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels
20001P006-04	West end culvert piping	05/19/03	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels
20001P027-01	Pipe trench between culvert & NH3 tanks	12/16/02	0	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels
20001P028-01	Demin Water Pump 158A & Pipe Trench	12/08/03	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels
20001P028-02	East end culvert & trench piping details	12/08/03	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels
20001P00601	Ammonia truck unloading and culvert piping	12/08/03	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels
33W	Location of power plant water services	08/29/40	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities
3716	Utility Drawings in Public ROW - Fair Oaks Ave - Glenarm to State St	03/27/87	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities
20001-274-M	Oil Water Separator Flo Trend Systems	01/16/03	0	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities
20001E011-04	Cathodic protection pipe pit area	02/24/03	0	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities
20001P001-01	Key plan underground piping A	12/08/03	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities
20001P003-01	GT 3&4 equipment drains underground	12/08/03	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities
20001P004-01	GT3 area underground piping	12/17/03	1	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities
20001P005-01	GT4 area underground piping	12/17/03	2	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities

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Document No./ Filename	Document Title	Current Rev. Date	Current Rev. No.	Released	Location
20001P009-01	NH3 tank area underground piping	12/16/02	0	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities
20001P011-01	Oily water separator pit piping	11/18/02	0	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities
20001-P-011-01	Piping Plan & Details Oily Water Separator Pit	11/18/02	0	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities
Glenarm Plant Fire Protection Drawing	Glenarm Plant Fire Protection Drawing	06/30/03	3	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities
GT1 GT2 UG GAS DWG	Piping Area III	04/30/75	4	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities
k350 OWS flow diagram	k350 oil water separator flow diagram	10/11/02	A	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities
Storm Drain and Conduit Trench Drawing	Storm Drain and Conduit Trench Drawing	04/10/03	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities
3626-04-02	GT-5 FIRSTPCRCorrectionEnvironmental Investigation	07/29/11	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Geotech Report and GPR
3626-04-02	GT-5 Environmental Investigation - 1 of 4 txt only	07/29/11	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Geotech Report and GPR\Enviro
3626-03	Geophysical Investigation	04/15/10	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Geotech Report and GPR\Geotech
3626-04-01	GT5 Geotechnical Investigation	08/01/11	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Geotech Report and GPR\Geotech
11195Hydrologue_ThermalResistivity_01	Soil Thermal Resistivity Tests	09/16/11	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Geotech Report and GPR\Soil Resistivity
geovisionthermal Resistivity	Soil Thermal Resistivity Tests	08/10/11	-	SPEC	Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Geotech Report and GPR\Soil Resistivity
Attachment 1.6 Scope of Supply DOR	Attachment 1.6 Scope of Supply DOR	-	-	SPEC	Attachment A3-Reference Information\A.3.D Division of Responsibility
Completion Turnover Start-Up	GLENARM REPOWERING PROJECT SCOPE OF RESPONSIBILITY MATRIX	10/11/13	A	SPEC	Attachment A3-Reference Information\A.3.D Division of Responsibility
14-ST Steam Quality	Steam Quality	-	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
2014-01-08 GT5 Pre-Bid Meeting Introduction	2014-01-08 GT5 Pre-Bid Meeting Introduction	01/08/14	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
2014-01-08 GT5 Pre-Bid Meeting Local Participation	2014-01-08 GT5 Pre-Bid Meeting Local Participation	01/08/14	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
2014-01-08 GT5 Pre-Bid Meeting Working with Pasadena	2014-01-08 GT5 Pre-Bid Meeting Working with Pasadena	01/08/14	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
505-101 Sheet 01	Topographic Survey Pasadena Glenarm Facility	-	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
505-101 Sheet 02	Topographic Survey Pasadena Glenarm Facility	-	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
505-101 Sheet 03	Topographic Survey Pasadena Glenarm Facility	-	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
5065A0-C23	Generator outline dwg for reference	08/23/13	F	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2

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BOP RFP Pre-Bid Presentation 010814-updated	BOP RFP Pre-Bid Presentation 010814-updated	01/08/14	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
C8 foundation dwg	STG Foundatoin Drawing			ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
C8 Layout STG	Layout	04/30/08	2	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
8 Loading data STG Foundatio	Loading Data [kN]	-	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
Construction Staging and Traffic Management Plan	Construction Staging and Traffic Management Plan	-	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
Contracts_Purchase Orders_Permits Insurance Requirements	Contracts Purchase Orders Permits Insurance Requirements	-	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
ES-1000 Rev 9	Feedwater Quality Requirements for Superheated Steam Applications	07/22/11	9	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
Exhibit A - DW_221732D01	Drawing 221732C1	-	0	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
Exhibit B - HA_221732D01	Form 3.2.1-D	-	0	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
FY 2014 Adopted General Fee Schedule Part 2	FY 2014 Adopted General Fee Schedule Part 2	-	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
JV468844D	SPX Cooling Technologies Prelim Dwg - Basin Section & Details	10/22/12	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
JV4688445	SPX Cooling Technologies Prelim Dwg - Schematic View	10/22/12	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
Jv468844B	SPX Cooling Technologies Prelim Dwg - Basin Section & Details	10/22/12	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
Location and Working Hours	Location and Working Hours	-	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
Moving Permit Application - For Wide Load and Heavy Equipment	Moving Permit Application - For Wide Load and Heavy Equipment	-	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
P12079-00 Jumper Tubes	Jumper Installation Proposal - IST	11/27/13	0	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
Public Right-of-Way Permit	Public Right-of-Way Permit	12/19/12	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
Rotor removal instructions _skid pan_	Rotor removal instructions skid pan	-	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
SK-8371-0	Condenser Outline Proposal Level (Proposal No. H-8371.HX)	-	0	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
Storage Container - Application	Storage Container - Application	07/01/13	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
Truck Route	Truck Route Map Exhibit 1	06/22/11	CAD90070A.MXD	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
11302-0004	Generic Flowsheet Dual Pressure OTSG W/ Burner, SCR & CO	02/20/06	P1	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
COP BOP Pre-Bid GE BOP Equipment_14Jan02	COP BOP Pre-Bid GE BOP Equipment	01/08/14	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
IST Presentation 20140108 (NXPowerLite)	IST Presentation 20140108 (NXPowerLite)	01/08/14	-	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2

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LM6000_Package_Layout_Evolution1.5.14r1	LM6000 Package Layout Evolution	-		ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
Bidder's Questions 2013-01-15 Rev 0	Bidder's Questions	01/15/14	0	ADD 2	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2
7253049-969960	Recommended Settings For Model 175 Nox Water Injection Pump Sr Drive	10/09/13	A	ADD 3	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 3
7253049-969961	Jaquet T401 GT Backup Overspeed Device Settings, SSW1	10/09/13	A	ADD 3	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 3
7253049-969962	Digital Multifunction Meter Settings Satec Pm174	10/09/13	A	ADD 3	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum
7253049-969964	Suggested Settings For Beckwith Model M-3425a Generator Protection System	10/09/13	A	ADD 3	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 3
7253049-969965	Automatic Voltage Regulator Settings, Brush Prismic A30	10/09/13	A	ADD 3	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 3
7253049-969966	DSM Settings	10/09/13	A	ADD 3	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 3
7253049-969966	Asbestos Survey and Lead-Based Paint Assessment Report	02/24/99	A	ADD 3	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 3
11303-0001	General Arrangement LM6000 PG OTSG		E	ADD4	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 4
C12079-PCP	OTSG Pre-Construction Plan	01/24/13	00	ADD 4	EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 4