

DUKE ENERGY INDIANA

REQUEST FOR PROPOSALS

FOR

PEAKING/INTERMEDIATE

POWER SUPPLY

BEGINNING 2008



Table of Contents

<u>Section</u>	<u>Description</u>	<u>Page</u>
1.0	Purpose of Request for Proposals	1
2.0	Instruction to Bidders	1
2.1	General	1
2.2	Overview of Process	2
2.3	Notice of Intent to Bid	2
2.4	Deadline and Method for Submitting Proposals	3
2.5	Questions and Interpretation of RFP	3
2.6	Product	4
3.0	Proposal Organization	6
3.1	Summary	6
3.2	Statements	6
3.3	Contract Terms	6
3.4	Proposal Limitations	6
3.5	Term Sheet	6
3.6	Company Financial Data	7
3.7	Security and Reliability of Physical Delivery	7
4.0	Proposal Content	7
4.1	Technical Proposal	7
4.2	Price Proposal	7
4.3	Deliverability	9
5.0	Proposal Evaluation and Contract Negotiations	9
5.1	Screening	9
5.2	Short List Development	10
5.3	Contract Negotiations	11
Exhibit A	Schedule	
Exhibit B	Notice of Intent to Bid	
Exhibit C	Sample Term Sheet	
Exhibit D	Functional Specifications Peaking Resource	
Exhibit E	Functional Specifications Intermediate Resource	
Exhibit F	Information Request for Peaking and Intermediate Resource	

1.0 Purpose of Request for Proposals

DUKE ENERGY INDIANA has a need for up to 600 MWs of peaking and/or intermediate resources in the 2008 to 2011 timeframe. Additionally, DUKE ENERGY INDIANA has a need for up to 800 MWs of peaking and/or intermediate resources in the 2012 to 2017 timeframe. DUKE ENERGY INDIANA will consider power purchase agreements (PPA) and unit ownership to satisfy this requirement.

Duke Energy Corp., one of the largest electric power companies in the United States, supplies and delivers energy to approximately 3.9 million U.S. customers. The company has nearly 37,000 megawatts of electric generating capacity in the Midwest and the Carolinas, and natural gas distribution services in Ohio and Kentucky. Duke Energy's Indiana operations provide 7,300 megawatts of safe, reliable and competitively priced electricity to more than 760,000 electric customers, making it the state's largest electric supplier.

Headquartered in Charlotte, N.C., Duke Energy is a Fortune 500 company traded on the New York Stock Exchange under the symbol DUK. More information about the company is available on the Internet at: www.duke-energy.com.

2.0 Instructions to Bidders

2.1 General

- 2.1.1 Nothing contained in this Request for Proposals (RFP) shall be construed to require or obligate DUKE ENERGY INDIANA to select any proposals or limit the ability of DUKE ENERGY INDIANA to reject all proposals in its sole and exclusive discretion. DUKE ENERGY INDIANA further reserves the right to withdraw and terminate this RFP at any time prior to the execution of a contract.
- 2.1.2 The submission of a proposal to DUKE ENERGY INDIANA shall constitute a Bidder's acknowledgment and acceptance of all the terms, conditions and requirements of this RFP, including Exhibits.
- 2.1.3 Subject to 2.1.4, all proposals submitted to DUKE ENERGY INDIANA pursuant to this RFP shall become the exclusive property of DUKE ENERGY INDIANA and may be used for any reasonable purpose by DUKE ENERGY INDIANA.
- 2.1.4 DUKE ENERGY INDIANA and Burns & McDonnell shall consider materials provided by Bidder in response to this RFP to be confidential only if such materials are clearly designated as "Confidential". Bidders should be aware that their proposal, even if marked "Confidential", may be subject to discovery and disclosure in regulatory or judicial proceedings that may or may not be initiated by DUKE ENERGY INDIANA. Bidders may be required to justify the requested confidential treatment under the provisions of a protective order issued in such proceedings. If required by an order of an

agency or court of competent jurisdiction, DUKE ENERGY INDIANA may produce the material in response to such order without prior consultation with the bidder.

2.1.5 Bidders shall be responsible for all costs and issues associated with bids; contract negotiations; completion of the contract; all taxes, duties, fees and other charges associated with the delivery of capacity and energy under the contract; and compliance with all local, state and federal laws that may affect the contract.

2.1.6 DUKE ENERGY INDIANA requires that capacity qualify as a Designated Network Resource as defined by the Midwest ISO. The energy delivery point shall be the PSI Load Zone as defined by the Midwest ISO. All costs and coordination required for any Transmission Service Requests for delivery to this point are the responsibility of the Bidder. Bidders are required to insure compliance with the Reliability First/Midwest ISO requirements.

2.2 Overview of Process

2.2.1 DUKE ENERGY INDIANA, through Burns & McDonnell, has set-up an e-mail box to collect all written communication from potential bidders as well as an internet site to provide uniform communication including updates and specific detail as may be provided from time to time through this bidding process. The e-mail address is DukeEnergyIndianaRFP@burnsmcd.com. The web site is DukeEnergyIndianaRFP.com.

2.2.2 The bid process will include the activities and events as indicated in the schedule on Exhibit A. Bid opening will be performed in private. Proposals will be screened and offers that do not include the information requirements of this RFP will be notified and allowed five business days to conform. The evaluation of the bids will be performed by DUKE ENERGY INDIANA with assistance provided by Burns & McDonnell. Bidders on any short list developed may be invited to begin negotiations of final details of the offers. Final evaluation of the offers, considering contract terms, will then be performed.

2.3 Notice of Intent to Bid

2.3.1 Each potential Bidder is requested to advise DUKE ENERGY INDIANA by email of its intent to submit a proposal by indicating a notice of intent to bid.

2.3.2 The Notice of Intent to Bid form may be faxed or e-mailed, to the following address:

Kiah Harris
Burns & McDonnell

Fax: (816) 822-3027
Email: DukeIndianaRFP@burnsmcd.com

2.4 Deadline and Method for Submitting Proposals

2.4.1 Proposals must be submitted in the complete name of the party expecting to execute any resulting contract with DUKE ENERGY INDIANA.

2.4.2 All proposals submitted in response to this RFP must be received by Burns & McDonnell no later than 4:00 PM CPT November 16, 2007.

2.4.3 **DUKE ENERGY INDIANA will not accept proposals received after the specified date and time set forth in Section 2.4.2 for any reason, and said proposals will be disqualified from further evaluation.**

2.4.4 Bidders are required to provide three (3) bound sets of all documents, including exhibits, as part of its proposal. It is further requested that multiple proposals submitted by each Bidder be identified separately. Proposals must be delivered to the following address:

DUKE ENERGY INDIANA RFP c/o
Kiah Harris
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Emailed proposals will **NOT** be acceptable as complying with the date and time requirements.

2.5 Questions and Interpretation of RFP

DUKE ENERGY INDIANA requires that all questions concerning this RFP be submitted in writing to Burns & McDonnell at the e-mail address indicated in Section 2.2.1. Answers will be posted as available to the web site. Bidders are encouraged to check the web site for updates. DUKE ENERGY INDIANA will not be responsible for other explanations or interpretations of the RFP than those included on the web site.

Written questions will be accepted until one week before the proposal submittal deadline. Answers will typically be posted to questions received during a respective week on the following Monday afternoon.

It shall be the obligation of the bidder to identify any conflicting statements, need for clarification, or omissions of pertinent data from the RFP before bids are due. Any questions not resolved by the bid date shall be identified in the proposal and a statement made as to the basis of the proposal.

2.6 Product

- 2.6.1 This RFP is for an aggregate amount of Unit Firm, as that term is defined in Schedule P of the EEI Master Power Purchase and Sales Agreement, capacity guaranteed to DUKE ENERGY INDIANA starting in 2008 or 2009. Capacity shall mean the instantaneous rate at which Energy can be delivered, received or transferred (measured in MW) to satisfy the criteria of the Midwest Independent Transmission System Operator, Inc. ("MISO") under its Open Access Transmission and Energy Market Tariff on file with the FERC and the MISO Business Practice Manuals, as the same may be amended (collectively, the "MISO Agreements"). Buyer shall have the right to designate the Capacity from the Capacity Source, in the amount consistent with the Capacity Amount identified on Exhibit D, as a Network Resource, as such term is defined in the MISO Agreements. Capacity provided shall meet the requirements of the Midwest ISO's Module E (Designated Network Resource) for use by DUKE ENERGY INDIANA in meeting its capacity obligations. During periods of unit outage, Bidder shall cause the replacement Capacity for the Capacity to comply with the obligations of a Network Resource under the MISO Agreements.
- 2.6.2 Associated energy shall be scheduled as needed with the maximum flexibility allowed by the Midwest ISO for the effective period of the associated contract.
- 2.6.3 The Delivery Point of all such energy shall be the PSI Load Zone as defined by the Midwest ISO.
- 2.6.4 The pricing, as set forth in Section 3.5, contained in each proposal shall include all costs, fees and charges for delivery to the Delivery Point.
- 2.6.5 Bidder's proposed generating source(s) must satisfy Reliability First/NERC Guides and Midwest ISO capacity resource requirements for obtaining network integration transmission service under the applicable TEMT (Transmission and Energy Market Tariff) and for accreditation by the applicable NERC regional reliability council or successor organizations. Bidder shall provide DUKE ENERGY INDIANA with sufficient documentation necessary to demonstrate compliance. Bidder will provide the status of (i) the ability of the Capacity Source to satisfy the definition of Generation Resource, as such term is defined in the MISO Agreements, and (ii) the market deliverability test by the MISO.
- 2.6.6 Proposals must be for purchase of Unit Firm capacity and associated scheduled energy. DUKE ENERGY INDIANA will consider proposals for energy priced in a variety of fashions, including tolling arrangements. All offers must identify the accredited resource(s) by

which the offer will comply with the MISO Module E requirements for the purchase period.

- 2.6.7 The minimum amount of capacity from any proposal shall be 50 MW for a minimum term of one year.
- 2.6.8 Bidder may submit more than one proposal. Only proposals for provision of capacity and energy, covering as a minimum one year will be considered. Proposals may be made for a single year.
- 2.6.9 The pricing, as set forth in Section 3.5, contained in each proposal shall reflect all present state and federal environmental regulations.
- 2.6.10 Proposals that rely upon generation resources or contracts located outside of the Midwest ISO's system must provide for the delivery of unit output to the Midwest ISO's transmission system as well as be deliverable to the PSI Load Zone . Transmission service which the Bidder acquires for the purpose of delivering said capacity from outside the Midwest ISO system to the Midwest ISO system shall be Firm Point-to-Point. Bidder shall be responsible for providing firm transmission throughout the term of the contract. Said transmission service shall be continuously reserved for the duration of the capacity transaction. Bidders shall provide assurance under any contract resulting from this RFP that any such outside generation capacity provided to DUKE ENERGY INDIANA is reserved for the sole use of DUKE ENERGY INDIANA in meeting its Module E requirements and is not associated with any other contractual obligations to third parties.
- 2.6.11 The Bidder shall be responsible for the providing and contracting of all transmission related services up to the point of delivery specified in 2.6.3, including but not limited to reactive power and voltage control, and loss compensation.
- 2.6.12 At some point during the evaluation process, however, DUKE ENERGY INDIANA, in its sole discretion, may deem it necessary to require a Bidder(s) to demonstrate the ability to deliver the proposed capacity to the Midwest ISO market if such deliverability is not already verified in the Midwest ISO's deliverability tests. Furthermore, DUKE ENERGY INDIANA may require the Bidder to demonstrate the deliverability of source fuels, e.g. natural gas or oil. If the Bidder is unable or fails to demonstrate such ability to obtain delivery services, DUKE ENERGY INDIANA may terminate further consideration of the Bidder's proposal.
- 2.6.13 Bidders are advised that prior to DUKE ENERGY INDIANA signing a power supply agreement, the Bidder will be required to provide substantial evidence of credit assurance as detailed in Section 3.7 of this RFP. All forms of credit assurance will be approved by DUKE ENERGY INDIANA before entering into an agreement. The form and

quality of credit assurance shall be approved by DUKE ENERGY INDIANA prior to further negotiations.

- 2.6.14 DUKE ENERGY INDIANA will consider standard contracting formats in use by the industry or contracts proposed by bidders as the basis for any contract negotiations resulting from this RFP. DUKE ENERGY INDIANA has contracted for capacity and energy using a variety of contract formats including the EEI or ISDA format contracts.

3.0 Proposal Organization

The Bidder understands that DUKE ENERGY INDIANA will rely on the representations contained in the Proposal and this Agreement in its evaluation and consideration of proposals submitted pursuant to the RFP. The Bidder further understands that its inability to substantiate and verify any such representation may result in the termination of further consideration and/or evaluation of the Proposal. All such representations made in the Proposal are true and accurate to the best of the Bidder's knowledge and belief. All Proposals must include the following minimum components and are requested to provide the information in the order provided:

3.1 Summary

3.2 Statements

- 3.2.1 A statement from the Bidder clearly indicating the time period during which the proposal will remain effective. DUKE ENERGY INDIANA requires that the structure of the proposals remain effective until May 31, 2008 as a minimum.

- 3.2.2 All documentation and signatures required depending on the nature of the proposal.

3.3 Contract Terms

A comprehensive listing and description, including a rationale if warranted, of all contract terms and conditions that the Bidder would seek during contract negotiations.

3.4 Proposal Limitations

A listing of any economic, operational or system conditions (including sensitivities to anticipated dispatch levels) that might affect the Bidder's ability to deliver capacity and energy, as offered and how the Bidder will provide the proposed availability.

3.5 Term Sheet

Information on the product, cost of the capacity and energy and other information shall be provided as per the sample Term Sheet contained in Exhibit C. Proposals shall provide a fixed, lump sum, or indexed price for the capacity and

energy for their proposed term including the cost for all losses, congestion costs, ancillary services, transmission delivery fees, MISO or other associated fees, taxes, duties, and any other costs associated with the furnishing of the capacity and associated energy to the proposed DUKE ENERGY INDIANA Delivery Point. No special pricing terms or conditions shall be permitted. For consideration in the evaluation process, proposals must contain a statement that all such fees have been included in the proposed price. Indexed offers shall be adjusted based on the following pricing points:

Gas: Chicago City Gate

3.6 Company Financial Data

Information on the makeup of the company and its parent organization shall be provided along with the most current annual financial reports and SEC Form 10-k (if applicable to the Bidder). If this information is available on the company's web site, then Bidder should provide the web page address where the information can be downloaded.

3.7 Security and Reliability of Physical Delivery

DUKE ENERGY INDIANA requires secure and reliable physical delivery of the capacity and associated energy corresponding to all power supply offers. Security and reliability of physical delivery will be guaranteed by either (1) evidence of contractual credit assurance by a third party, (2) parent corporation commitment accompanied by an investment level credit rating from a major rating agency, or (3) various combinations of 1 and 2. All forms of credit assurance will be approved by DUKE ENERGY INDIANA before entering into a power supply agreement.

4.0 Proposal Content

For consideration in the evaluation process, proposals **must** contain the information outlined in the sample Term Sheet provided in Exhibit C.

Supporting information outlined in the following paragraphs for the respective proposal type will be beneficial in assisting the evaluation of the proposal. Should this information not be submitted with the proposal, DUKE ENERGY INDIANA may require the Bidder to submit this information in order to verify the Bidder's ability to meet DUKE ENERGY INDIANA' requirements for resource acquisitions and any future contract resulting from this RFP process. In addition, DUKE ENERGY INDIANA has requirements for resources it acquires.

Bidders are directed to the Functional Specifications contained in Exhibits D and E for the detailed requirements.

4.1 Technical Information

Provide sufficient technical information to fully describe the project and allow a determination of the status and condition of proposed sources of capacity. The information outlined in Exhibit F should be provided.

4.2 Price Proposal

Proposals must provide a detailed description of the pricing terms and conditions. (See sample Term Sheet, Exhibit C) During any subsequent discussions and/or negotiations, DUKE ENERGY INDIANA may request modification to the proposed pricing scheme in order to accommodate its own operational or administrative requirements. For consideration in the evaluation process, proposals must contain the information outlined in the following paragraphs for the respective proposal type.

Note: DUKE ENERGY INDIANA requires that Bidders utilizing coal or gas as a source fuel use an industry accepted standard basis to build its energy price forecast. Bidders shall specify the index, source location of fuel, type of fuel, and Btu content, as well as the expected transportation method and cost.

4.2.1 Ownership Purchase

Bidders may offer capacity and energy from new or existing resources on an ownership purchase basis. Under this arrangement, DUKE ENERGY INDIANA shares in all future ownership responsibilities and provides a payment in the form of an equity purchase in accordance with a purchase agreement to be negotiated. The Bidder must demonstrate that it has the requisite authorization to make an offer for an equity purchase in the facility represented in its proposal.

4.2.1.1 New Resources (See Attachments D-F)

- (i) Equity amount to be funded by DUKE ENERGY INDIANA must be provided which includes all costs of developing, designing, constructing, and start-up of the facility to commercial operations. DUKE ENERGY INDIANA will evaluate the financing of the equity purchase from its sources. Amounts and dates of payments required by DUKE ENERGY INDIANA during construction shall be provided.
- (ii) An estimate of the costs and timing of on-going annual capital additions associated with each proposed generation facility.
- (iii) An estimate of annual fixed O&M costs associated with each proposed generation facility.
- (iv) An estimate of annual emission allowances, variable O&M, and startup costs associated with each proposed generation facility for

loading at its expected operating annual capacity factor.

- (v) Estimated percent annual unit equivalent availability factor (EAF) as defined in the NERC GADS Definitions.
- (vi) All costs associated with delivery of the energy to DUKE ENERGY INDIANA's Delivery Point excluding ancillary services to be provided by DUKE ENERGY INDIANA.

4.2.1.2 Existing Resources

- (i) A lump sum payment, which includes all costs of acquisition of the proposed capacity including transfer of title, permits, etc. to DUKE ENERGY INDIANA.
- (ii) An estimate of the costs and timing of on-going annual capital additions associated with each proposed generation facility.
- (iii) An estimate of annual fixed O&M costs associated with each proposed generation facility.
- (iv) An estimate of annual emission allowances, variable O&M, and startup costs associated with each proposed generation facility for loading at its expected operating annual capacity factor. Estimated percent annual availability and guaranteed minimum percent annual unit availability.
- (v) All costs associated with delivery of the energy to DUKE ENERGY INDIANA's Delivery Point excluding ancillary services to be provided by DUKE ENERGY INDIANA.

4.2.2 Contract Purchase

Bidders may offer capacity and energy from new or existing resources or from a utility system on a contract purchase basis. Under this arrangement, the Bidder retains all ownership responsibilities and DUKE ENERGY INDIANA provides only a capacity and energy payment in accordance with a purchase agreement to be negotiated. The Bidder must demonstrate that it has the requisite regulatory authorization to make sales contemplated by its proposal.

4.2.2.1 Proposed capacity cost, and availability for new or existing resources shall be provided. DUKE ENERGY INDIANA reserves the right to estimate the availability of a resource at its sole discretion if a reasonable availability is not provided by the Bidder. Proposed capacity rates shall include all losses, wheeling and other charges associated with delivery to the DUKE ENERGY INDIANA Delivery Point with the exception of ancillary services to be provided by DUKE ENERGY INDIANA.

- (i) The Bidder shall provide the starting capacity rate and applicable formula for escalation with proposed indices or a schedule of capacity rates for the proposed contract term.
- (ii) The Bidder shall identify the type of transmission service being provided, delivering parties and delivery point(s) of energy to DUKE ENERGY INDIANA's system.

4.2.2.2 Proposed energy rates shall include all losses, wheeling and other charges associated with delivery to the DUKE ENERGY INDIANA Delivery Point with the exception of ancillary services to be provided by DUKE ENERGY INDIANA.

- (i) The Bidder shall provide the starting energy rate and applicable formula for escalation with proposed indices or a schedule of energy rates for the proposed contract term.
- (ii) The actual delivered energy, in any month, shall be determined in accordance with the metering procedures as set forth in the contract which will be negotiated between DUKE ENERGY INDIANA and the successful Bidder.
- (iii) The Bidder should specify the basis (i.e. annually, quarterly, monthly, etc.) and type of all payments it expects to receive. In the case of a fully dispatchable generating facility, such payments might include start-up payments (\$/start) or spinning payments (\$/operating hour). The Bidder may further specify a pricing formula, schedule, or some combination of the two, for determining these payments.

- 4.2.2.3 The Bidder must provide a printed schedule projecting for each contract year, quarter, or month, as appropriate, depending upon how frequently the Bidder's rate(s) or its respective components will be updated, for the full term of the proposed contract of the following:
- (i) full capacity rate (and all its components)
 - (ii) capacity payment
 - (iii) energy rate (and all its components)
 - (iv) projections of any independent variables (i.e. operating hours, number of starts, etc.) that are to be used in the calculation of payments
 - (v) energy payment

4.3 Deliverability

All proposals shall provide the results of the deliverability tests of the Midwest ISO for assurance that the stated capacity is deliverable to the Midwest ISO system. If the generating facility(ies) are located outside the Midwest ISO, Bidder shall identify the type of firm transmission service being provided for delivery to the Midwest ISO as outlined in Section 2.6.12.

5.0 Proposal Evaluation and Contract Negotiations

5.1 Screening

- 5.1.1 After the proposal submittal deadline, Burns & McDonnell will privately open all proposals and begin reviewing proposals for completeness and responsiveness. Those proposals which do not include all information identified in Sections 3 and 4 shall be notified and provided one week to cure the deficiency. Those proposals not cured within the time allotted will not be evaluated further.
- 5.1.2 An initial screening will be developed to identify those proposals that meet the minimum criteria established by DUKE ENERGY INDIANA in Section 2.6 for evaluation. Those proposals considered to not meet the required threshold of product quality, credit assurance, and other factors will be rejected.
- 5.1.3 DUKE ENERGY INDIANA may request that a Bidder provide additional information or clarification to its original proposal. DUKE ENERGY INDIANA shall make such requests in writing and will also specify a deadline for compliance. Failure to provide the requested information or clarification by the deadline will result in the disqualification of the proposal.

- 5.1.4 DUKE ENERGY INDIANA may select any number of proposals, or reject all proposals or at any time withdraw and terminate this RFP pursuant to Section 2.1.1, as it, in its sole and exclusive judgment deems appropriate.

5.2 Short List Development

- 5.2.1 After the initial screening, Burns & McDonnell will provide information to DUKE ENERGY INDIANA with company information redacted. DUKE ENERGY INDIANA will evaluate the remaining proposals based on price and other resource performance factors. Proposals using a tolling arrangement will be evaluated using Duke Energy's proprietary fundamental gas price forecast adjusted for delivery at the Chicago City Gate hub and the proposed heat rate.
- 5.2.2 During the evaluation process, Burns & McDonnell may choose to initiate discussions with one or more Bidders for the purposes of obtaining clarifying information. For purposes of this RFP, discussions shall simply indicate DUKE ENERGY INDIANA's interest in a particular proposal and its desire to obtain from the Bidder additional detailed information that may not necessarily be contained in the proposal. Discussions with a Bidder shall in no way be construed as commencing "negotiations" with a Bidder. DUKE ENERGY INDIANA intends to use such discussions as a method of reducing the number of proposals to those, if any, that DUKE ENERGY INDIANA determines warrant further evaluation and, possibly, contract negotiations. If DUKE ENERGY INDIANA intends to initiate discussions, it will notify the Bidder of such intention and require the Bidder of such proposal to confirm, in writing, the offer and representations contained in its original proposal.
- 5.2.3 If DUKE ENERGY INDIANA is not interested in a particular proposal, it will notify the Bidder as soon as practical after such determination is made.
- 5.2.4 DUKE ENERGY INDIANA will assess the benefits of the proposals primarily through the delivered prices for the capacity and energy. However, consideration of contractual options or other subjective factors will be included where more than one proposal provides similar benefits.

5.3 Contract Negotiations

- 5.3.1 DUKE ENERGY INDIANA will notify a Bidder in writing of its interest in commencing contract negotiations with that Bidder. DUKE ENERGY INDIANA's commencement of and active participation in such negotiations shall not be construed as a commitment from DUKE ENERGY INDIANA to execute a contract. If, however, a contract is

successfully negotiated, it shall not be effective unless and until fully executed by DUKE ENERGY INDIANA in accordance with its procedures and any and all required regulatory approvals have been received.

- 5.3.2 Prior to contract negotiations, Bidders selected for the short list will have the opportunity to refresh their pricing. Any short listed Bidder that provides a refreshed price above that of the next best bid not on the short list may be disqualified from the short list at DUKE ENERGY INDIANA'S sole discretion and replaced with the next best bid not on the short list.
- 5.3.3 During the contract negotiation phase, price will continue to be the primary evaluation factor. DUKE ENERGY INDIANA will also be considering contract terms at this point in the evaluation to determine the most attractive offer or set of offers.
- 5.3.4 DUKE ENERGY INDIANA reserves the right at any time, during contract negotiations, at its sole discretion, to terminate or, once terminated, to resume negotiations with a Bidder.
- 5.3.5 DUKE ENERGY INDIANA will require that certain provisions be included in its contracts. Such provisions may include, but are not limited to, insurance, indemnification, performance guarantees, liquidated damages for non-performance, firm security (depending on the financial means and historical performance of the Bidder), ability of DUKE ENERGY INDIANA to reassign its entire rights, or a portion thereof, to the contract to another party, and a provision that allows DUKE ENERGY INDIANA to terminate the contract in the event that certain state and federal regulatory approvals are not received to the satisfaction of DUKE ENERGY INDIANA.
- 5.3.6 This RFP contains general guidelines and requirements for developing and submitting proposals. Nothing herein shall be construed to bind DUKE ENERGY INDIANA unless and until a contract with a Bidder has been successfully negotiated, executed, and is effective. Once effective, the contract will govern the relationship between and responsibilities of the parties. The costs for responding to the RFP and any subsequent contract negotiations are the responsibility of the Bidder.

Exhibit A
Schedule

The schedule as outlined below and referred to throughout this document is based on DUKE ENERGY INDIANA's expectations as of the release date of this RFP.

Release of RFP	September 21, 2007
Notice of Intent to Bid	October 12, 2007
Proposal Submittal Deadline	November 16, 2007

DUKE ENERGY INDIANA reserves the right to extend or otherwise modify any portion of the schedule or terminate the RFP process at its sole discretion.

Exhibit B

NOTICE OF INTENT TO BID
Due by October 12, 2007

1. Upon reviewing the RFP, we plan to submit a proposal on the DUKE ENERGY INDIANA RFP.

2. Bidder:

3. Contact:

4. Mailing Address: _____

e-mail address: _____

5. Tel Number: () _____ Fax Number: () _____

6. Signature of respondent:

Title:

Date: _____

Fax to: 816.822.3027 Burns & McDonnell
Attn: Kiah Harris

E-Mail to: DukeEnergyIndianaRFP@burnsmcd.com

Exhibit C-PPA

Sample Term Sheet
*Note to Bidder-Provide a separate term sheet for each different
Term or capacity offering*

Product Unit Firm capacity as defined in the EEI Master Power Purchase and Sales Agreement, Schedule P.

Seller _____

Purchaser DUKE ENERGY INDIANA

Delivery Point PSI Load Zone

Term _____
Bidder to provide. Must be for one year as a minimum.

Capacity Amount _____ MW
Minimum of 50 MW
DUKE ENERGY INDIANA will evaluate any amount from minimum to Capacity Amount in increments of 50MW unless Bidder so notes that only the Capacity Amount can be evaluated.

Energy As Scheduled

Scheduling Scheduling shall be performed to the maximum flexibility allowed by MISO and in accordance with the MISO Agreement.

Price Capacity shall be priced at \$_____ per MW per month over the term
Energy shall be priced at [\$_____ per MWh over the Term]
[\$_____ per MWh plus Guaranteed Heat Rate times Gas Price over the Term]
[\$_____ per MWh for the first year indexed to _____ for subsequent year(s).]
[\$_____ per MWh year 1, \$_____ MWh year 2, etc]

Pricing to include all ancillary service costs, Midwest ISO charges, taxes and other fees necessary for delivery to the Delivery Point.
Bidder to select Pricing option to be used for evaluation of the proposal.

Guaranteed Heat Rate _____ Btu per kWh (HHV)

Guaranteed Availability _____ %

Exhibit C-Ownership Offer –Life of Unit

Sample Term Sheet

Note to Bidder-Provide a separate term sheet for each different resource option offered

Resource _____

Fuel Source _____

MISO CP node _____

Seller _____

Purchaser DUKE ENERGY INDIANA

Capacity Amount _____MW
Minimum of 50 MW
DUKE ENERGY INDIANA will evaluate any amount from minimum to Capacity Amount in increments of 50MW unless Bidder so notes that only the Capacity Amount can be evaluated.

Energy As Scheduled

Scheduling Scheduling shall be performed to the maximum flexibility allowed by MISO and in accordance with the MISO Agreement.

Fixed Purchase Price \$_____ per MW per month over the resource life or \$_____ lump sum in accordance with purchase agreement

Fixed O&M \$_____ per MW per [month] [year] escalated at _____% per year or Attach a schedule of annual fixed charges.

Capital Investment \$_____ per year (Provide schedule of any upgrades or life extension efforts)

Variable O&M \$_____ per MWh scheduled escalated at _____ % per year or Attach a schedule of annual variable costs.

Guaranteed Heat Rate as Applicable _____ Btu per kWh (HHV) minimum load (define MW load)
_____ Btu per kWh (HHV) 50% load
_____ Btu per kWh (HHV) 70% load
_____ Btu per kWh (HHV) 90% load
_____ Btu per kWh (HHV) 100% load (define MW load)

Exhibit D – Functional Specifications for Peaking Load Generation

1.0 DESIGN REQUIREMENTS

1.1 Overall Plant

- 1.1.1 The plant shall meet utility reliability and efficiency standards and be designed for a 30 year life including standard utility requirements for equipment redundancy, material selection, equipment selection, plant general arrangement, safety, environmental, weather proofing, facilities, automation, instrumentation, and control. Proposals based on typical IPP/Merchant plant standards will not be acceptable. These functional specifications provide the minimum requirements for bid purposes. Detailed specifications will be provided prior to acceptance of final pricing.
- 1.1.2 Total Peaking Load Nominal Capacity at the project site of at least 80 MW but no greater than 800 MW
- 1.1.3 Simple cycle unit with combustion turbine(s), with SCR and CO catalyst if applicable
- 1.1.4 The unit shall be designed to operate on 100% natural gas fuel. The Seller shall also provide an option for operation of the combustion turbine units at base load with 100% distillate fuel oil.
- 1.1.5 Ability to turn-down to 50% of full base load or lower.
- 1.1.6 Automatic Generation Control (AGC) and load following.
- 1.1.7 Minimum ramp rate of 7% of guaranteed capacity per minute per combustion turbine.
- 1.1.8 Maximum allowable start-up time from initiation of start-up to full load operation, including time required for all pre-ignition purges and other permissives of:
 - 30 minutes for hot-start
 - 60 minutes for cold-start.
- 1.1.9 A cold-start shall not be required until at least 8 hours of unit shut-down.
- 1.1.10 Ability to complete a hot shutdown to hot re-start cycle in one hour or less.
- 1.1.11 Ability to meet all air emissions criteria and permit conditions during startup, shut-down, and for all operating loads.
- 1.1.12 Ability to operate between 0.95 leading to 0.85 lagging power factor at full load over the full ambient temperature range.
- 1.1.13 Desired capability to start from zero load and reach grid synchronization at full load or other Seller-specified load point within 10 minutes from the dispatch order to start, and perform three start-stop cycles per day with no maintenance penalty.

1.2 Combustion Turbine & Generator

- 1.2.1 To be of proven design with large number of units in operation and experiencing high reliability track record.
- 1.2.2 If the unit design includes inlet cooling, it shall be provided by either mechanical chilling or evaporative cooling only. The evaporative cooling system shall include two 100% capacity cooling water supply pumps. If mechanical chilling is provided, a 20% margin above the maximum refrigerant load shall be included in the design. Steam or water injection for power augmentation will not be accepted.
- 1.2.3 Inlet filters to the combustion turbine shall be provided meeting the requirements of the combustion turbine supplier. The filters shall be selected to meet the ambient conditions and shall account for severe weather conditions such as heavy rain, fog, or dust conditions that result in high differential pressures. The filters shall be selected and sized to provide minimum installed site life of 24,000 operating hours and designed to permit pre-filter change-outs during on-line operation with no curtailment.
- 1.2.4 The exhaust duct shall be insulated with asbestos-free and ceramic fiber-free insulation covered with an interior stainless steel liner. Insulation shall be retained to prevent packing. The liner shall be retained in such a manner as to prevent movement perpendicular to the duct and to allow axial thermal expansion and contraction. Provisions at overlaps shall be provided to prevent the liner from buckling or being lifted by gas flow velocities in the duct.
- 1.2.5 Electric turning gear with pneumatic back up shall be provided.
- 1.2.6 Overhead gantry crane shall be designed and located to remove large CT turbine and generator parts.
- 1.2.7 The compressor section shall be a multistage axial-type and shall be directly coupled to the turbine section. Modulating inlet air guide vanes shall be provided.
- 1.2.8 The combustion system shall be designed to maximize combustion efficiency, combustion stability and equipment life while firing natural gas. The combustion controls shall automatically regulate the proper fuel flow and mixture to meet the emissions criteria.
- 1.2.9 Turbine blading shall be designed to minimize loads due to tangential, axial and torsional modes of vibration under all anticipated operating conditions.
- 1.2.10 Turbine blades and nozzles shall be coated as necessary to prevent degradation from erosion, corrosion, or deposits. Seller shall list the specific components to be coated and the types of coatings to be used in the proposal. Blade coatings must be available domestically.
- 1.2.11 A complete lubrication system including reservoir, pumps, filters, pressure regulation, cooling-heating, circulating pipe to the turbine shall be provided and include the following:
 - 1.2.11.1 Oil Reservoir with immersion heater the thermostatic controls.

- 1.2.11.2 Lube oil Pumps (2) with AC motor drives or an alternate, one full capacity shaft driven lube oil pump, one full capacity AC motor driven lube oil pump, and one partial capacity DC motor driven lube oil pump.
- 1.2.11.3 Lube Oil Coolers: Two 100 percent capacity water-cooled lube oil coolers shall be provided.
- 1.2.11.4 Lube oil Filters: A duplex, 100% capacity multi-element filter with a continuous flow transfer valve shall be provided. The filtering system shall be designed to minimize the potential for varnishing or sludge build-up.
- 1.2.12 The generator shall be closed air cooled or hydrogen cooled with a purge system.
- 1.2.13 Generator and controls designed to meet all operating requirements.
 - 1.2.13.1 The electric generator shall comply with the ANSI/IEEE standards. Its capacity shall match or exceed the gross output of the CT when operating at the rated lagging power factor. The insulation of the generator stator and field windings will be non-hygroscopic, Class F type, complying with ANSI C50.13, but having a temperature rise not exceeding that of Class B under any operating condition within the specified output. The strands shall be transposed by Roebel method. The degree of transposition shall be of 540 degrees. The generator power factor range at full MW load shall be between 0.85 lagging and 0.95 leading. Monitoring devices shall be: dual element Stator Slot RTDs, hot and cold gas thermocouples, Bus Capacitive Couplers and Stator Slot Couplers for Partial Discharge monitoring, and an air gap flux probe for field shorted turn detection.
 - 1.2.13.2 The generator shall be provided with an excitation system of the static exciter type, and it shall include solid state voltage controls with automatic and manual regulation. The AVR shall be capable of maintaining the steady-state terminal voltage of the generator within +/- 0.2 % of the set point over the entire operating range of the synchronous machine. The AVR shall be designed with dual redundant channels including the voltage transformers dual inputs.
 - 1.2.13.3 Provision shall be made for automatic and manual synchronizing.
- 1.2.14 The generator winding diagram, diagram of RTD locations, generator electrical and capability curves and electrical characteristic data sheets, and required design data for system modeling shall be provided.
- 1.3 SCRs, if applicable, including aqueous ammonia injection systems, shall be designed to control NO_x to the required emission limits. The design shall provide the lowest achievable emission.
 - 1.3.1 Adequate 19% aqueous ammonia bulk storage for 14 days of operation at full load.
 - 1.3.2 Two 100% capacity ammonia delivery pumps and two ammonia injection fans/pumps.

- 1.3.3 Adequate number of manual valves for full isolation of both ammonia storage and delivery systems.

- 1.4 Exhaust stack shall be constructed of carbon steel with interior stack coating and, if necessary to meet noise limitations, sound buffers. Stack drains shall be provided and routed to the chemical waste drain system. A stack damper is required, with insulation of the stack and exhaust duct up to the stack damper. Stack warning lights and/or coloring shall be incorporated, as required by Federal Aviation Authority (FAA) regulations.

- 1.5 Electrical Systems
 - 1.5.1 Automatic Generation Control (AGC):
 - 1.5.1.1 Each CT shall be equipped with all the control and telemetry required to participate in automatic generation control. This shall include the capability to change MW output at a rate of at least 7% of guaranteed MW output per minute subject to plant limitations. The overall range of AGC shall be from minimum load to 100% of guaranteed generator output. The AGC system shall have provisions for load following based on frequency deviation and also for fixed output levels of power from the generator independent from frequency variations.

 - 1.5.2 Main Step Up Power Transformer:
 - 1.5.2.1 The main transformers shall have enough capacity to export the net output of the plant at the MCR rating of the generator at maximum lagging MVA capability. The transformer shall be oil-filled, with forced oil and air cooling, designed for generator step-up voltage operation, and equipped with a tap changer for de-energized operation on the high-voltage winding. The transformer shall comply with ANSI Standard C57.12.00

 - 1.5.2.2 The noise from the transformer shall not exceed the levels indicated in NEMA Standard TR-1.

 - 1.5.3 Auxiliary Transformer:
 - 1.5.3.1 The auxiliary transformer shall be oil-filled, with ONAN/ONAF/ONAF cooling, designed for generator voltage operation to the plants medium voltage auxiliary buses, and equipped with an on load (OLTC) tap changer for energized operation on the high-voltage winding. The transformers shall comply with ANSI Standard C57.12.00. The transformer shall be able to deliver their rated output at all tap positions without exceeding the rated temperature rise.

 - 1.5.3.2 The noise from the transformer shall not exceed the levels indicated in NEMA Standard TR-1.

 - 1.5.4 Isolated Phase Bus Duct:
 - 1.5.4.1 The isolated phase bus shall interconnect the following:

- Generator
- Main power transformer
- Auxiliary transformer

1.5.4.2 The bus enclosure shall utilize a forced air cooling system encompassing redundant fans, filters, air dryers, etc., and shall be maintained at positive air pressure. Redundant pressure switches shall be provided to monitor the enclosure pressure and shall activate an alarm at the DCS in the event of low air pressure in the enclosure

1.5.4.3 The temperature rise, at rated current, above ambient temperature of 40°C of air surrounding the bus enclosures and cubicles, shall be in accordance with ANSI C37.23, Table 1.

1.5.5 Medium and Low Voltage Switchgear and Motor Control Centers (MCCs):

1.5.5.1 The medium voltage switchgear shall consist of medium-voltage circuit breakers and medium-voltage fusible starters arranged lineups.

1.5.5.2 The LV system shall be furnished with grounding resistor(s) rated at 5 Amps continuous. The transformers shall be of ventilated dry type.

1.5.5.3 The MCCs shall consist of magnetic-only circuit breakers and starters.

1.5.5.4 Provisions shall be made to facilitate the lock out of the circuit breakers and starters in the off position.

1.5.6 Motors:

1.5.6.1 The medium voltage motors shall include those rated above 250 hp. The low voltage motors shall include those rated 250 hp and less. The motor nameplate horsepower multiplied by the motor nameplate 1.15 service factor shall be at least 20% greater than the driven equipment operating range maximum brake horsepower.

1.5.6.2 Motors shall be designed for full voltage starting and frequent starting where required, and shall be suitable for continuous duty in the specified ambient. The motors insulation shall be Class F and shall be operated with Class B temperature rise.

1.5.6.3 Each medium voltage motor shall be furnished with bearing and winding temperature detectors to be wired to the DCS for monitoring and alarm functions.

1.5.6.4 The motors' stator winding shall be form wound and the rotor shall be constructed with copper bars. Sleeve type bearings shall be provided.

1.5.7 Protection Relays System:

1.5.7.1 Digital protection systems in accordance with IEEE C37.101, IEEE C37.102 and IEEE C 37.106 shall be provided for:

- Generators

- Generator Circuit Breakers
- Transformers
- Medium Voltage Switchgear
- Low Voltage Switchgear
- Medium Voltage Motors

1.5.7.2 The protection relays for the generators and transformers shall be mounted in dedicated relay protection cabinets. The protection relays for the medium voltage switchgear, low voltage switchgear and medium voltage motors shall be located on the respective switchgear.

1.5.7.3 The protection relays shall be microprocessor based multi-function type and shall be provided with multiple functions that can be selectively used or disabled.

1.5.8 Essential Service AC and DC Systems:

1.5.8.1 The essential-service AC and DC system consists of two subsystems, essential-service ac and essential-service DC. The essential-service AC subsystem provides low-volt AC, single-phase power to essential control, instrumentation, and equipment loads that require uninterruptible ac power. The essential-service DC subsystem provides a reliable source of power for the essential-service AC subsystem and critical control and power functions during normal and emergency plant operating conditions.

1.5.8.2 The essential service DC system shall be of ungrounded type two batteries each furnished with two chargers. The batteries shall be sized to supply full projected load for no less than 4 hours after loss of charging system.

1.5.8.3 The essential AC system shall include an uninterruptible power supply (UPS) system.

1.5.9 Lighting Systems:

1.5.9.1 The lighting system shall provide illumination for plant operation under normal conditions, and emergency lighting to perform manual operations during outage of the normal power source.

1.5.9.2 The area lighting system shall provide illumination for the performance of general yard tasks, safety, and plant security.

1.5.10 Cable and Raceway Systems:

A cable and raceway system shall be installed to interconnect the individual equipment in the plant. The function of the raceway system shall be to enclose, contain, and protect electrical power, control, and instrument circuits; various pieces of equipment; devices; cabinets; and structures.

1.5.11 Grounding and Lightning Protection System:

The grounding system shall consist of bare, stranded copper cable buried in the

soil below the ground-floor concrete slab and spaced in a grid pattern sized as required for safe step-and-touch potentials. A sufficient number of ground rods shall be installed and welded exothermically to the grid to assure a low-resistance earth connection. These rods shall be situated throughout the grounding system to minimize voltage gradients that occur during faults.

1.5.12 Lightning Protection:

The lightning protection system shall be in accordance with the latest applicable NFPA Standard 780 and ANSI/UL Standard 96A.

1.5.13 Cathodic Protection System:

The cathodic protection system shall control electrochemical corrosion on the external surfaces of designated metal piping buried in the earth; bottoms of above-ground pad-mounted steel tanks; wetted metal surfaces of the intake structures; interior surfaces of condenser and heat exchanger water boxes; and interior surfaces of designed, steel water storage tanks.

1.5.14 Transmission Interconnection

1.5.14.1 The electrical systems must be designed and constructed to comply with all North American Reliability Council and MISO requirements, and must meet the applicable requirements of the transmission owner at the point of interconnection

1.5.14.2 The generator must include all relays, meters, power circuit breakers, synchronizers and other control and protective apparatus that are reasonably necessary for proper and safe operation of the units in parallel with the transmission system.

1.6 Communication Systems:

The plant communications system shall provide the station personnel associated with the operation of the plant with a reliable and convenient means of plant paging and communication.

1.7 Instrumentation and Control Systems

1.7.1 Distributed Controls and Monitoring Systems

1.7.1.1 The control and monitoring functions shall be implemented in a microprocessor based distributed control systems (DCS). The DCS shall also include provisions for interface via redundant Ethernet data links with control and monitoring systems furnished by equipment suppliers utilizing distributed microprocessor-based systems or Programmable Logic Controllers (PLCs).

1.7.1.2 The DCS controllers shall be dual redundant with one in operation and the other in standby. Transfer between the two controllers shall be bumpless. The same criterion applies to the DCS power supplies. Triple redundant approach shall be employed for the field devices, where two-out-of-three logic is implemented for the switches and the median select (not the highest and not the lowest) is employed for the analog

measurements. The redundancy shall include the capability to implement on line program and system configuration changes.

1.7.1.3 The DCS shall include a self-diagnostics system that detects source of internal failures down to the input/output subsystem level. When faults are diagnosed, a message shall be capable of being displayed on the CRT screen identifying the source and location of a failure, thus assisting the maintenance personnel in clearing the faults.

1.7.1.4 The DCS shall perform all system performance calculations, alarm and Sequential Event Recording (SER).

1.7.1.5 The graphic display system shall have the capability and functionality to monitor the total DCS and all systems interfaced to it.

1.7.2 Continuous emissions monitoring system (CEMS)

1.7.2.1 The CEMS shall measure emissions and produce all required data logging and reporting in accordance with the applicable State and Federal regulations. The analyzer system shall include extractive analyzers, sample probes, sample conditioning, heated sample lines where required, a fully programmed controller, calibration gas bottles for zero and span, calibration accessories, and mounting hardware for installation to provide a complete and operable system.

1.7.2.2 The data logging and reporting system shall store a minimum of three (3) years of data and automatically produce reports as required.

1.7.3 Vibration Monitoring

All large rotating machinery driven by medium-voltage motors shall have vibration and thrust monitoring. The application of monitoring equipment shall be subject to the size and type of rotating equipment.

1.7.4 Field mounted Instruments

All field mounted instruments that are necessary for the plant protection, control and monitoring shall be provided. These shall include:

- Thermocouples and Resistance Temperature Detectors
- Transmitters
- Flow Elements
- Temperature, Pressure and Level Switches
- Level Switches
- Local Indicators

1.8 Auxiliary Cooling Water System (if applicable)

1.8.1 The system shall include auxiliary cooling water pumps, all piping, valves, instruments, and accessories as necessary for a complete operating system. Equipment materials and filters upstream of the heat exchangers shall be suitable for the water quality expected in the system. Seasonal introduction of debris shall be considered in the design of the filters upstream of the heat exchangers. The filters shall be self cleaning with automatic actuation on differential pressure. The

pumps are to be located as an integral part of the wet cooling tower design in conjunction with the circulating water pumps.

- 1.8.2 Two 100% capacity supply pumps.
- 1.8.3 Two 100% capacity cooling water heat exchangers, each isolatable for routine cleaning and tube plugging without plant curtailment.
- 1.8.4 Make up water source of adequate supply and quality.
- 1.8.5 Automated chemical delivery/feed and monitoring system with chemical storage for 7 days of plant operation.
- 1.8.6 Two 100% capacity chemical injection pumps.

1.9 Make up Water Systems

1.9.1 Raw Water

- 1.9.1.1 Adequate supply source available to support year round plant operation.
- 1.9.1.2 Source water quality and temperature within each application's specified requirements.
- 1.9.1.3 Makeup water treatment system to remove suspended solids as necessary and meet demineralizer inlet quality standards in accordance with demineralizer manufacturer recommendations
- 1.9.1.4 Media filtration systems (if used) to include redundant filters for offline backwashing.
- 1.9.1.5 Wastes from pretreatment system to be dewatered as necessary for land disposal in accordance with all solid waste disposal regulations.
- 1.9.1.6 Fully automated, instrumented and redundant pretreatment system.

1.9.2 Demineralized Water (if applicable)

- 1.9.2.1 Demineralizer system to include two 100% trains or three 50% trains that meet EPRI Cycle Chemistry Guidelines with one train out of service for regeneration.
- 1.9.2.2 Common regeneration equipment to be used for all demineralizer trains.
- 1.9.2.3 All water treatment and regeneration equipment fully enclosed and climate controlled.
- 1.9.2.4 System able to produce a minimum of 110% of plant's maximum daily consumptive water use.
- 1.9.2.5 Demineralized water storage capacity sufficient to support a minimum five days of plant service including two start/stop cycles per day.

- 1.9.2.6 Building adequately sized and designed for ease of removal of large equipment (roll up doors, overhead crane & trolley).
- 1.9.2.7 All piping, storage tanks, equipment and materials designed to minimize corrosion and to meet specifications associated with water production and delivery.
- 1.9.2.8 All external piping and associated equipment insulated and traced as required given plant location.
- 1.9.2.9 Piping arrangement plumbed to allow for use of portable demineralizers.
- 1.9.2.10 Fully automated system with critical controls, instrumentation and alarms available both locally and into the control room (able to start, operate and stop unmanned).

1.10 Gas Conditioning Station

- 1.10.1 Station designed to deliver fuel at the quantity, pressure and quality required to meet OEM specifications, including applicable power augmentation operation. The Seller shall design, furnish, and install the natural gas filtering, compression equipment, and pipeline to accommodate the complete operating range of the turbine(s) without affecting the stable operation of the facility. The fuel conditioning equipment shall process the fuel to meet the OEM requirements for the fuel to the equipment. The Seller shall supply individual fuel gas regulators and associated relief valves for the gas consuming components if necessary to prevent exceeding the manufacture's maximum allowable supply pressure to such components. If required by the manufacturer, the Seller shall furnish and install equipment necessary to heat the fuel to a temperature acceptable to the gas turbine manufacturer.
- 1.10.2 Two 100% or three 50% electric driven gas compressors shall be supplied.
- 1.10.3 Ability to change out filters and dryers on line with no supply restrictions.
- 1.10.4 All valves and components designed and located for access for routine maintenance.
- 1.10.5 Cathodic protection on gas pipeline to meet interconnection requirements or AGA as applicable.

1.11 Instrument and Service Air

- 1.11.1 Adequate dryers and filters to meet OEM quality specifications shall be provided. The instrument air system shall have adequate dryers and filters to meet OEM quality specifications. Two 100% heatless dryers with 2 x 100% filters shall supply dry (-40°F dew point at 125 psig), oil free air for use by control systems and instrumentation.
- 1.11.2 Use of compressed air supplying the instrument air distribution header (via the instrument air dryer) for such auxiliary functions as purge air (except for

instruments) is discouraged. Instrument air shall be provided in the Facility's instrument/maintenance shop.

- 1.11.3 The station air system shall provide air for maintenance tools. The station air system shall be a separate distribution system which provides air for maintenance tools and shall have valved access points at convenient maintenance around the facility. The air shall be dry and clean.

1.12 Waste Water Treatment System

- 1.12.1 Designed to process and treat all waste streams in accordance with approved discharge permit requirements.
- 1.12.2 If permitted for "zero discharge", system will be adequately designed and automated to minimize labor burden of plant staff.
- 1.12.3 If permitted for "zero discharge", Seller will provide two independent sources for waste processing heat.
- 1.12.4 If permitted for "zero discharge", related equipment designed to have capacity for at least 120% of maximum expected operating requirements.
- 1.12.5 100% redundancy for all critical chemical treatment and waste water processing pumps, motors and compressors.
- 1.12.6 Adequate chemical storage for 30 days of operation.

1.13 Fire Protection Master Plan and Design Basis

- 1.13.1 The Seller shall be responsible for the design and supply of fully operational fire protection systems supplied entirely in accordance with the applicable codes, standards, manufacturer's recommendations, product listings and this Specification. The fire protection systems supplied shall be designed in a consistent manner throughout the premises and all components shall be able to operate to meet all requisite functions in a consistent manner, to the satisfaction of both the purchaser and the local statutory authorities.
- 1.13.2 The Seller shall be responsible for preparing a Fire Protection Master Plan and Design Basis that will define the design requirement for fire protection. This shall consist of as a minimum the following documents:
 - a. Building and Fire Codes, and Life Safety Compliance Review Report
 - b. Fire Risk Evaluation Report
 - c. Hazardous Area Classification Evaluation

All three documents shall be submitted to the local statutory authorities and the Purchaser for review, comment and approval.

- 1.13.2.1 Building and Fire Codes, and Life Safety Compliance Review – The Review shall be performed by a qualified fire protection and engineering

firm experienced in the preparation of fire protection master plans, building code reviews and reports and exit/egress analysis calculations and diagrams. The report shall identify and address for each building, pre-engineered and/or pre-fabricated building, equipment enclosure and/or structure at a minimum the following:

- a. Applicable building and fire codes, standards, recommendations and amendments.
- b. Building classification, occupancy and permitted construction types.
- c. Building height and area limitations.
- d. Fire resistance requirements for floors, exterior and interior walls and structural supports.
- e. Egress and exiting requirements.
- f. Detailed exit analysis and calculations. Prepare exit analysis drawings documenting occupant loads, required exit widths, occupant load distribution and travel distances.
- g. Combustible and flammable gases and liquids process equipment and storage fire protection, quantity limitations, and storage requirements.
- h. Accessibility requirements.
- i. Fire Department access and fire fighting facilities.
- j. Occupancy and area separation requirements.
- k. Fire alarm and detection systems.
- l. Sprinkler/Standpipe and fire hose station requirements (duration, flows, pressures and densities).
- m. Fire protection water supply and storage requirements.
- n. Emergency power and lighting requirements.
- o. Smoke control and ventilation requirements.
- p. Elevator Requirements

1.13.2.2 Fire Risk Evaluation - A NFPA 850 fire risk evaluation shall be initiated as early in the design process as practical to ensure that the fire prevention and fire protection recommendations as described in this document have been evaluated in view of the plant-specific considerations regarding design, layout, and anticipated operating requirements. The evaluation shall result in a list of fire prevention features to be provided based on acceptable means for separation or control of common and special hazards, the control or elimination of ignition sources, and the suppression of fires. The fire risk evaluation shall be approved by the owner prior to final drawings and installation.

1.13.2.3 Hazardous Area Classification Evaluation - The basis for classification evaluation shall be NFPA 70 (National Electrical Code [NEC]), NFPA 497, API 500, vendor information and other standards, as applicable.

1.14 Metering

1.14.1 All fuel and electric use meters shall be revenue grade designed, calibrated and installed to conform to required standards.

1.15 Exterior Equipment

- 1.15.1 All outdoor equipment and materials designed and installed consistent with expected use and environmental conditions (e.g. moisture & dust controls, cooling and ventilation, heat tracing and insulation for electrical motors, cabinets/load centers, sample, trap and chemical feed lines, etc.)

1.16 Property, Buildings and Roads

- 1.16.1 The Seller shall supply and install all buildings as required for the facility. These buildings shall include the combustion turbine area, administration, central control room, maintenance/shop area, warehouse area, storage area, first aid room, laboratory, water treatment area, chemical feed/sample panel equipment, electrical equipment building, etc.
- 1.16.2 The combustion turbine building to be provided with overhead crane and interior lay-down area sufficient for all overhauls.
- 1.16.3 Centralized structures with control room, offices, warehouse, file storage, lunch room and maintenance shops in close proximity to each other and in close proximity to the combustion turbine building
- 1.16.4 Office space, file storage area, warehouse and control room sized appropriately for 30 year plant service life.
- 1.16.5 Warehouse and maintenance shops designed with roll up doors to accept large pieces of equipment.
- 1.16.6 All HVAC and ventilation systems throughout the plant sized and installed appropriately for climate and dust control.
- 1.16.7 All buildings, structures and equipment designed and built to required seismic specifications.
- 1.16.8 The plant roads shall be asphalt concrete on sub-base of properly stabilized soil aggregate mixture. The paving and sub-base thickness shall be based on design and construction traffic loads. The main plant road shall be minimum 25 feet wide. Road inside of the switchyard area may be rock (suitable for purpose) surfaced only. All road surfaces designed and paved to allow for proper drainage and to allow transportation of heavy equipment and materials throughout the plant.

2.0 GENERAL

2.1 Design

- 2.1.1 All valves and valve actuators shall be accessible for operation and maintenance.
- 2.1.2 All plant equipment and facilities materials shall be designed and built to U.S. codes and standards.
- 2.1.3 All equipment foundations and concrete structures shall be designed and built per manufacturer's criteria, soil investigation, and geotechnical report. Soil stabilization, remediation, piles, etc. shall be provided as required for all plant facilities including buried lines and facilities as required by the geotechnical investigation report.

- 2.1.4 Concrete design shall be in accordance with the latest release of American Concrete Institute (ACI), codes 318, 350, and 530.
 - 2.1.5 The steel structure to be used for pipe racks, the combustion turbine enclosures and warehouse/maintenance shop shall be designed, fabricated, and erected in accordance with American Institute of Steel Construction specification.
 - 2.1.6 All 100% redundant plant equipment (pumps and motors) shall be fully isolatable to facilitate maintenance repairs or replacement.
 - 2.1.7 Plant noise levels within permit specifications under all operating conditions.
 - 2.1.8 Emergency lighting shall be provided in all areas of operation.
 - 2.1.9 Overhead cranes or paved access and pads for mobile cranes with sufficient capacity for all overhaul activities. The general arrangement must be designed to allow for removal and replacement of all plant equipment.
 - 2.1.10 100% redundancy on CEMS sample and monitoring equipment and equipment accessible for maintenance.
 - 2.1.11 Enclosed hazardous waste storage and handling area sized and located for safe storage and ease of use.
 - 2.1.12 Online water wash and drain system installed with all valves easily accessible for routine maintenance.
 - 2.1.13 Product water quality consistent with EPRI and OEM requirements.
 - 2.1.14 Site elevation graded to above 100 year flood level.
 - 2.1.15 Plant property lines identified and fenced with appropriate signage.
 - 2.1.16 480-Vac, 3-phase, 60A welding receptacles with integral on/off switches shall be located, as a minimum, at grade near both ends of each combustion turbine, and in all remote equipment locations and maintenance buildings, and shall not be located in classified areas.
- 2.2 Operation
- 2.2.1 Adequate water supply source available to support year round plant operation at full load operation. Source water quality and temperature within each application's specified requirements. The makeup water treatment shall be fully automated, instrumented and with redundant pre-filtering system. Adequate chemical storage shall be provided for 30 days of operation.
 - 2.2.2 Hoisting crane (small) on the air inlet to move filters and perform maintenance.
 - 2.2.3 Ability to change out dryer elements and filters on line with no plant curtailments.
 - 2.2.4 If permitted for "zero discharge", system will be adequately designed and automated to minimize labor burden of plant staff.

- 2.2.5 If permitted for “zero discharge”, Seller will provide a source of waste processing heat while the plant is offline, or a mobile wastewater processing capability.
- 2.2.6 100% redundancy for all critical chemical treatment and waste water processing pumps, motors and compressors.
- 2.2.7 Hazardous waste storage and handling area sized for safety and ease of shipping.
- 2.2.8 Bulk hydrogen storage sufficiently sized for 2 generator purges and fills for each generator.
- 2.2.9 Bulk carbon dioxide storage sufficiently sized for 2 generator purges for each generator.
- 2.2.10 Adequate evaporative cooling water supply and storage for ten continuous days of operation, or proof of adequate backup supply. Water quality within recommended OEM specifications.

3.0 CODES AND STANDARDS

Systems and equipment shall be designed in accordance with Codes and Standards, Regulations, Governmental Approvals and Governmental Rules in effect at the date of execution of this Contract. Applicable sections of Governmental Rules will be referenced as required in the relevant technical specifications. In case of conflict among this Scope Document, referenced Governmental Rules, and manufacturer's standard practices, the Purchaser shall determine which will govern. Where there are no applicable Governmental Rules, power industry practices, as applicable, shall apply.

3.1 State and Local Building Codes, Standards and Ordinances

- 3.1.1 Code, Rules and Regulations of the State of Indiana, or applicable state
- 3.1.2 Indiana Occupational Safety & Health Division (IOSH), or applicable state
- 3.1.3 Local laws, ordinances, and regulations

3.2 U.S. Government Codes, Ordinances, and Standards

- 3.2.1 Occupational Safety and Health Act (OSHA) - 29 CFR 1910, 1926
- 3.2.2 Federal Aviation Agency (FAA) - Obstruction Marking and Lighting AC No. 70/7460-IJ)
- 3.2.3 Environmental Protection Agency (EPA) - 40 CFR 423, 40 CFR 60, 40 CFR 72, 40 CFR 75, 40 CFR 112
- 3.2.4 Appendix A to Part 36, “American Disability Act Accessibility Guidelines for Buildings and Facilities

3.3 American Society of Mechanical Engineers

The following standards of the American Society of Mechanical Engineers (ASME), as applicable, shall be followed:

3.3.1 ASME Boiler and Pressure Vessel Code Sections:

I. Power Boilers

II. Material Specifications

Part A: Ferrous Materials

Part B: Nonferrous Materials

Part C: Welding Rods, Electrodes, and Filler Metals

III. Nondestructive Examination

VIII. Pressure Vessels Division 1

IX. Welding and Brazing Qualifications

3.3.2 ASME B31.1 - Power Piping

3.3.3 ASME Performance Test Codes:

The following performance test code may be used as guidance in conducting the performance for the overall facility:

- PTC 22 Gas Turbine Power Plants
- PTC 1 General Instructions
- PTC -19.1 Measurement Uncertainty

3.3.4 American National Standards Institute

The following standards of the American National Standards Institute (ANSI), as applicable, shall be followed:

- B16.1 Cast Iron Pipe Flanges and Flanged Fittings
- B16.5 Steel Pipe, Flanges, and Fittings
- B16.34 Steel Valves
- B30.17 Overhead and Gantry Cranes
- B133.8 Gas Turbine Installation Sound Emissions
- C2 National Electrical Safety Code
- C37.010 Application Guide for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis
- C37.04 Standard Rating Structure for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis
- C37.06 Switchgear - AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis -Preferred Ratings and Related Required Capabilities

- C37.13 Standard for low Voltage AC Power Circuit Breakers Used in Enclosures
- C37.20.1 Standard for Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear
- C37.20.2 Standard Metal-Clad and Station-Type Cubicle Switchgear
- C37.23 Guide for Metal-Enclosed Bus and Calculating Losses in Isolated-Phase Bus
- C37.30 Definitions and Requirements for High-Voltage Air Switches, Insulators, and Bus Supports
- C37.101 Generator Grounding Protection
- C37.102 AC Generator Protection
- C37.106 Abnormal Frequency Protection
- C50.41 Polyphase Induction Motors for Power Generating Stations
- C57.12.10 Transformers - 230 kV and below, 833/958 through 8,333/110,417 kVA Single Phase and 750/862 through 60,000/80,000/100,000 kVA Three Phase without Load Tap C Changing, and 3,750/4,682 through 60,000/80,000/100,000 kVA With Load Tap Changing- Safety Requirements
- C57.12.55 Transformers - Dry-Type Transformers Used in Unit Installation, Including Unit Substations
- C57.12.70 Terminal Markings and Connections for Distribution and Power Transformers
- C57.13 Standard Requirements for Instrument Transformers
- C57.109 Guide for Transformer Through-Fault-Current Duration
- C62.11 Standard for Metal-Oxide Surge Arresters for AC Power Circuits

3.3.5 Industry Standards

Applicable standards issued by the following industry organizations:

- American Association of State Highway and Transportation Officials (AASHTO)
- American Boiler Manufacturers Association (ABMA)
- American Concrete Institute (ACI)
- American Gas Association (AGA)
- American Gear Manufacturers Association (AGMA)

- American Institute of Steel Construction (AISC)
- American Iron and Steel Institute (AISI)
- Air Moving and Conditioning Association (AMCA)
- American Petroleum Institute (API)
- American Society for Nondestructive Testing (ASNT)
- American Society for Testing and Materials (ASTM)
- American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)
- American Water Works Association (AWWA)
- American Welding Society (AWS)
- Anti-Friction Bearing Manufacturers Association (AFBMA)
- Crane Equipment Manufacturer's Association of America (CMMA)
- Expansion Joint Manufacturers Association (EJMA)
- Fluid Control Institute (FCI)
- Heat Exchange Institute (HEI)
- Hydraulic Institute (HI) - Standard for Pumps
- Illuminating Engineering Society (IES)
- Institute of Electrical and Electronics Engineers (IEEE)
- Insulated Cable Engineers Association (ICEA)
- Instrument Society of America (ISA)
- Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry
- Metal Building Manufacturers Association (MBMA)
- National Association of Corrosion Engineers (NACE)
- National Electrical Manufacturers Association (NEMA)
- National Fire Protection Association (NFPA) National Fire Codes
- Pipe Fabrication Institute (PFI)

- Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
- Steel Structures Painting Council (SSPC)
- Thermal Insulation Manufacturers Association (TIMA)
- Tubular Exchanger Manufacturers Association (TEMA)
- Underwriters Laboratories, Inc. (UL) - fire protection equipment only
- Welding Research Council (WRC)
- Electric Utility Requirements

3.3.6 Transmission and Gas Interconnections

- DUKE ENERGY INDIANA Interconnection Requirements
- Midwest Independent Transmission System Operator (MISO)
- Pipeline interconnect requirements for natural gas interconnection

Exhibit E – Functional Specifications for Intermediate Load Generation

4.0 DESIGN REQUIREMENTS

4.1 Overall Plant

- 4.1.1 The plant shall meet utility reliability and efficiency standards and be designed for a 30 year life including standard utility requirements for equipment redundancy, material selection, equipment selection, plant general arrangement, safety, environmental, weather proofing, facilities, automation, instrumentation, and control. Proposals based on typical IPP/merchant plant standards will not be acceptable. These functional specifications provide the minimum requirements for bid purposes. Detailed specifications will be provided prior to acceptance of final pricing.
- 4.1.2 Total Intermediate Load Nominal Capacity at the project site of at least 300 MW but no greater than 800 MW
- 4.1.3 Combined cycle unit with combustion turbine(s), heat recovery steam generator(s), and steam turbine(s)
- 4.1.4 The unit shall be designed to operate on 100% natural gas fuel. The Seller shall also provide an option for operation of the combustion turbine units at base load with 100% distillate fuel oil (i.e. duct burners operated only on natural gas fuel).
- 4.1.5 Ability to turn-down to 50% of full base load or lower.
- 4.1.6 Automatic Generation Control (AGC) and load following.
- 4.1.7 Minimum ramp rate of 7% of guaranteed capacity per minute per combustion turbine.
- 4.1.8 Maximum allowable start-up time from initiation of start-up to full load operation, including time required for all pre-ignition purges and other permissives of:
 - 300 minutes for hot-start
 - 420 minutes for cold-start.
- 4.1.9 A cold-start shall not be required until at least 8 hours of unit shut-down.
- 4.1.10 Ability to complete a hot shutdown to hot re-start cycle in less than three hours.
- 4.1.11 Ability to meet all air emissions criteria and permit conditions during startup, shut-down, and for all operating loads.
- 4.1.12 Ability to operate between 0.95 leading to 0.85 lagging power factor at full load over the full ambient temperature range.

4.2 Combustion Turbine & Generator

- 4.2.1 To be of proven design with large number of units in operation and experiencing high reliability track record.

- 4.2.2 If the unit design includes inlet cooling, it shall be provided by either mechanical chilling or evaporative cooling only. The evaporative cooling system shall include two 100% capacity cooling water supply pump. If mechanical chilling is provided, a 20% margin above the maximum refrigerant load shall be included in the design. Steam or water injection for power augmentation will not be accepted.
- 4.2.3 Inlet filters to the combustion turbine shall be provided meeting the requirements of the combustion turbine supplier. The filters shall be selected to meet the ambient conditions and shall account for severe weather conditions such as heavy rain, fog, or dust conditions that result in high differential pressures. The filters shall be selected and sized to provide minimum installed site life of 24,000 operating hours and designed to permit pre-filter change-outs during on-line operation with no curtailment.
- 4.2.4 The exhaust duct shall be insulated with asbestos-free and ceramic fiber-free insulation covered with an interior stainless steel liner. Insulation shall be retained to prevent packing. The liner shall be retained in such a manner as to prevent movement perpendicular to the duct and to allow axial thermal expansion and contraction. Provisions at overlaps shall be provided to prevent the liner from buckling or being lifted by gas flow velocities in the duct.
- 4.2.5 Electric turning gear with pneumatic back up shall be provided.
- 4.2.6 On line water wash and drain system installed with all valves easily accessible for routine maintenance.
- 4.2.7 Overhead gantry crane shall be designed and located to remove large CT turbine and generator parts.
- 4.2.8 The compressor section shall be a multistage axial-type and shall be directly coupled to the turbine section. Modulating inlet air guide vanes shall be provided.
- 4.2.9 The combustion system shall be designed to maximize combustion efficiency, combustion stability and equipment life while firing natural gas. The combustion controls shall automatically regulate the proper fuel flow and mixture to meet the emissions criteria. Control of NO_x emissions shall be through dry low NO_x combustors, with water injection allowed only for operation on distillate fuel.
- 4.2.10 Turbine blading shall be designed to minimize loads due to tangential, axial and torsional modes of vibration under all anticipated operating conditions.
- 4.2.11 Turbine blades and nozzles shall be coated as necessary to prevent degradation from erosion, corrosion, or deposits. Seller shall list the specific components to be coated and the types of coatings to be used in the proposal. Blade coatings must be available domestically.
- 4.2.12 A complete lubrication system including reservoir, pumps, filters, pressure regulation, cooling-heating, circulating pipe to the turbine shall be provided and include the following:
 - 4.2.12.1 Oil Reservoir with immersion heater the thermostatic controls.
 - 4.2.12.2 Lube oil Pumps (2) with AC motor drives or an alternate, one full capacity shaft driven lube oil pump, one full capacity AC motor driven lube oil pump, and one partial capacity DC motor driven lube oil pump.

- 4.2.12.3 Lube Oil Coolers: Two 100 percent capacity water-cooled lube oil coolers shall be provided.
- 4.2.12.4 Lube oil Filters: A duplex, 100% capacity multi-element filter with a continuous flow transfer valve shall be provided. The filtering system shall be designed to minimize the potential for varnishing or sludge build-up.
- 4.2.13 The generator shall be closed air cooled or hydrogen cooled with a purge system.
- 4.2.14 Generator and controls designed to meet all operating requirements.
 - 4.2.14.1 The electric generator shall comply with the ANSI/IEEE standards. Its capacity shall match or exceed the gross output of the CT when operating at the rated lagging power factor. The insulation of the generator stator and field windings will be non-hygroscopic, Class F type, complying with ANSI C50.13, but having a temperature rise not exceeding that of Class B under any operating condition within the specified output. The generator power factor range at full MW load shall be between 0.85 lagging and 0.95 leading. Monitoring devices shall be: dual element Stator Slot RTDs, hot and cold gas thermocouples, Bus Capacitive Couplers and Stator Slot Couplers for Partial Discharge monitoring, and air gap flux probe for field shorted turn detection.
 - 4.2.14.2 The generator shall be provided with an excitation system of the static exciter type, and it shall include solid state voltage controls with automatic and manual regulation. The AVR shall be capable of maintaining the steady-state terminal voltage of the generator within +/- 0.2 % of the set point over the entire operating range of the synchronous machine. The AVR shall be designed with dual redundant channels including the voltage transformers dual inputs.
 - 4.2.14.3 Provision shall be made for automatic and manual synchronizing.
- 4.2.15 The generator winding diagram, diagram of RTD locations, generator electrical and capability curves, electrical characteristic data sheets, and required design data for system modeling shall be provided.
- 4.3 HRSG (Heat Recovery Steam Generator)
 - 4.3.1 The HRSG shall be designed, fabricated, and stamped in accordance with the ASME Boiler and Pressure Vessel Code (B&PVC), Section I and all codes and standards required therein. Any additional state or local requirements for certification of the HRSG pressure vessel shall be met. All materials not covered by ASME codes shall conform to the latest edition of the ASTM standard.
 - 4.3.2 Steam headers and tubes designed and constructed with materials suitable for 300 total start-up cycles per year and 30 year life cycle.
 - 4.3.3 The HRSG shall be designed to operate in a sliding pressure and fixed pressure mode with the necessary equipment to enable startup with the steam turbine. The HRSG shall be suitable for operation at all loads from startup to the rated maximum steam generating capacity. The turndown ratio and rate of load change of the HRSG shall be compatible with the CT to the extent possible. The HRSG design shall include a condensate heater bypass to maintain the minimum

specified gas outlet temperature. A recirculation system shall also be provided for condensate temperature control.

- 4.3.4 An integral deaerator shall be provided with the HRSG. The deaerator shall be designed, fabricated, examined, tested and stamped in accordance with ASME Code for Boiler and Pressure Vessels, Section I and The HEI "Standards and Typical Specifications for Deaerators." The integral deaerator shall use the low-pressure saturated steam from the low-pressure steam drum as the primary steam supply. A deaerating condenser with a redundant vacuum system is an acceptable alternative. Condensate dissolved oxygen shall be less than 7 ppb under any operating conditions.
- 4.3.5 The steam drums shall have shop installed steam separators of sufficient size and capacity to limit moisture carryover to the superheater. Carryover shall be less than 0.2 percent for the HP, 0.04 percent for the IP and 0.03 percent for the LP drums at rated steam production when supplied with feedwater. Separators shall be centrifugal or inertial types.
- 4.3.6 All tube material shall be seamless for all sections of the HRSG. If HRSG tubing heat exchange surface uses fins, they shall not be higher than 3/4 inch; shall not have a fin spacing of more than six (6) fins per inch of tube length; may be serrated fins; and shall be attached by a continuous weld. The tube fin thickness shall be a minimum of .049 inch. HRSG economizer and evaporator tubes shall not be less than 1.5" outside diameter. Stainless steel or high chrome tube materials shall be used for all areas with potential for flow accelerated corrosion.
- 4.3.7 Chemical injection points, water and steam sampling lines, and blowdown drains shall be configured to allow for sampling and control of steam and boiler water chemistry within HRSG and steam turbine OEM specifications and within EPRI guidelines. Analyzer outputs shall be tied to the plant DCS.
- 4.3.8 Supplemental duct firing shall be provided as required to meet the guaranteed unit output. HRSG duct burner output shall be sized to provide the maximum additional steam generation from the HRSG without changing the unfired design heat transfer surface or materials of construction. The duct burner pilots shall be capable of continuous duty at loads up to and including peak load, and will be fired on natural gas. If applicable, duct burner fuel isolation valves installed and purge system readily accessible.
- 4.3.9 Automatic steam drain and sky vent valves designed for cycling duty without leakage and controllable locally and/or from control room. The sky vent shall be sized for 100% of steam production. Drain and vent manual isolation stop valves shall be installed so that they are accessible for routine maintenance. Drains and vents shall be adequately sized to meet both HRSG and steam turbine heat up specifications. HRSG steam isolation valves shall be installed to allow for tube bundle hydro testing and chemical cleanings. All safety and relief valves shall be accessible for routine maintenance.
- 4.3.10 HRSG construction shall be welded. No rolled or rolled and seal-welded joints shall be permitted.
- 4.3.11 The maximum permissible tube bundle depth between access lanes shall be fifteen (15) rows. The design shall include access for inspection and NDE testing of all headers and header-to-tube welds and the ability to plug any tube at the header without removal of any HRSG components.

- 4.3.12 Steam drum(s) shall have access ways of the pressure seal design in all heads. Access ways shall be 14 inches by 18 inches. Steam drum end enclosures shall be provided to ensure that drum instrumentation does not freeze.
 - 4.3.13 The HRSGs shall be equipped with SCRs, including aqueous ammonia injection systems, designed to control NO_x to the required emission limits. The design shall provide the lowest achievable emission.
 - 4.3.14 Adequate 19% aqueous ammonia bulk storage for 14 days of operation at full load.
 - 4.3.15 Two 100% capacity ammonia delivery pumps and two ammonia injection fans/pumps.
 - 4.3.16 Adequate number of manual valves for full isolation of both ammonia storage and delivery systems.
 - 4.3.17 Steam pipe hangers designed (lockable) to accommodate hydro testing.
 - 4.3.18 Option for automated stack dampers; Seller to provide capital and expense costs.
 - 4.3.19 Steam bypass system to condenser sized to provide for 100% bypass at maximum generating capacity with loss of steam turbine.
 - 4.3.20 Interstage attenuators shall be designed to prevent droplet carryover or quenching of downstream superheater tubes.
 - 4.3.21 Exhaust stack shall be constructed of carbon steel with interior stack coating and, if necessary to meet noise limitations, sound buffers. Stack drains shall be provided and routed to the chemical waste drain system. A stack damper is required, with insulation of the stack and exhaust duct up to the stack damper. Stack warning lights and/or coloring shall be incorporated, as required by Federal Aviation Authority (FAA) regulations.
 - 4.3.22 Space shall be allowed in the HRSG for future CO₂ catalyst installation.
 - 4.3.23 Adequate connections shall be provided for nitrogen blanket system.
- 4.4 Steam Turbine Generator
- 4.4.1 To be of proven design with large number of units in operation and experiencing high reliability track record.
 - 4.4.2 All necessary equipment shall be provided as required for automation of the turbine-generator unit. This shall include those items of equipment, as recommended by manufacturer, which will allow complete turbine startup, operation, load change, and shutdown.
 - 4.4.3 Water induction protection shall be provided to protect the steam turbine and other sensitive equipment, in accordance with the intent of ASME Recommended Practices for the Prevention of Water Damage to Steam Turbines Used For Electrical Power Generation (TDP-1-1998).

- 4.4.4 Steam control and shutoff valves shall be designed to meet OEM performance criteria.
- 4.4.5 All warm up drain valves and steam traps shall be properly sized and located to accommodate steam turbine OEM start up, shutdown and on-line operating criteria.
- 4.4.6 Overhead gantry crane shall be designed and located to remove large steam turbine and generator parts.
- 4.4.7 Turning gear shall be furnished complete with AC electric motor drive with backup DC motor drive. A hand crank (or pneumatic) system shall also be provided. The in and out positions of gear mechanisms shall be indicated.
- 4.4.8 Electronic and mechanical overspeed protection.
- 4.4.9 Generator and controls designed to be able to meet all operating requirements.
- 4.4.10 The generator shall be closed air cooled or hydrogen cooled with a purge system.
- 4.4.11 Lube and Control Oil Systems
 - 4.4.11.1 The facility shall include a complete lubrication system including storage, pumps, filters, pressure regulation, cooling-heating, circulating pipe to the turbine, and instrumentation and controls.
 - 4.4.11.2 The oil reservoir will be sized in accordance with industry standards to provide a normal operating volume of at least 5 times the flow per minute to the bearings and other services. Electrical immersion heaters with thermostatic control shall be furnished and shall be capable of maintaining the optimal oil temperature at minimum specified winter design ambient temperature conditions.
 - 4.4.11.3 Lube oil supply and drain piping, valves, and fittings may be stainless or carbon steel. Lube oil supply piping shall be routed inside the drain line.
 - 4.4.11.4 Alternating current motor-driven oil pumps shall be supplied with one emergency DC motor-driven pump. As an alternate, the equipment may have one full capacity shaft driven lube oil pump, one full capacity AC motor-driven lube oil pump, and one emergency DC motor-driven lube oil.
 - 4.4.11.5 Two 100% capacity water-cooled lube oil coolers shall be supplied.
 - 4.4.11.6 A duplex, multi-element lube oil filter with a continuous flow transfer valve shall be provided.
 - 4.4.11.7 Equipment shall include two 100% oil vapor extractors with mist eliminators which meet permit emission limits. Extractors shall purge bearing housings and reservoir of oil vapors.
 - 4.4.11.8 Coalescent type mist eliminators shall be provided. Oil shall be separated and returned to the lube oil reservoir.

4.4.11.9 Additional instrumentation shall include dual-element thermocouples for monitoring and alarm to measure steam turbine and generator bearing metal temperatures. Bearing header and vapor extraction vacuum pressures shall be measured and indicated locally and on the unit control system. Lube oil pressure to each bearing or in the common lube oil supply line shall be indicated in the unit's control system.

4.4.11.10 A lube oil conditioner shall be provided to remove particulate and free and emulsified water content in accordance with manufacturer's specifications. Valved connections shall be provided to provide for installation of portable centrifuge.

4.4.11.11 Hydraulic fluid system shall be designed to use fire resistant fluid. It shall be provided with the following:

- A reservoir with access doors, float-type level gauge, and two high- and two low-level switches
- Redundant, full size AC motor-driven pumps
- Filtering equipment with in-line filters
- Two full-size coolers
- 316 stainless steel piping from reservoir to and from turbine and to hydraulic actuators
- Dual thermocouples and indicating thermometers for indication of fluid temperature, and pressure gauges and electronic pressure transmitters for indication of fluid pressure

4.4.12 Generator:

4.4.12.1 The electric generator shall comply with the ANSI/IEEE standards. Its capacity shall match or exceed the gross output of the steam turbine when operating at the rated lagging power factor. The insulation of the generator stator and field windings will be non-hygroscopic, Class F type, complying with ANSI C50.13, but having a temperature rise not exceeding that of Class B under any operating condition within the specified output. The generator power factor range at full MW load shall be between 0.85 lagging and 0.95 leading. Monitoring devices shall be: dual element Stator Slot RTDs, hot and cold gas thermocouples, Bus Capacitive Couplers and Stator Slot Couplers for Partial Discharge monitoring, and air gap flux probe for field shorted turn detection.

4.4.12.2 The generator shall be provided with an excitation system of the static exciter type, and it shall include solid state voltage controls with automatic and manual regulation. The AVR shall be capable of maintaining the steady-state terminal voltage of the generator within +/- 0.2 % of the set point over the entire operating range of the synchronous machine. The AVR shall be designed with dual redundant channels including the voltage transformers dual inputs.

4.4.12.3 Provision shall be made for automatic and manual synchronizing.

4.4.13 The generator winding diagram, diagram of RTD locations, generator electrical and capability curves, electrical characteristic data sheets, and required design data for system modeling shall be provided.

4.5 Electrical Systems

4.5.1 Automatic Generation Control (AGC):

4.5.1.1 Each generating unit shall be equipped with all the control and telemetry required to participate in automatic generation control when all unit CTs are in operation. This shall include the capability to change MW output at a rate of at least 7% of guaranteed MW output per minute subject to plant limitations. The overall range of AGC shall be from minimum load to 100% of guaranteed turbine generator output. The AGC system shall have provisions for load following based on frequency deviation and also for fixed output levels of power from the generator independent from frequency variations.

4.5.2 Main Step Up Power Transformer:

4.5.2.1 Each generator shall be connected to a separate step-up transformer.

4.5.2.2 The main transformers shall have enough capacity to export the net output of the plant at the MCR rating of the generator at maximum lagging MVA capability. The transformer shall be oil-filled, with forced oil and air cooling, designed for generator step-up voltage operation, and equipped with a tap changer for de-energized operation on the high-voltage winding. The transformer shall comply with ANSI Standard C57.12.00

4.5.2.3 The noise from the transformer shall not exceed the levels indicated in NEMA Standard TR-1.

4.5.3 Auxiliary Transformer:

4.5.3.1 The auxiliary transformer shall be oil-filled, with ONAN/ONAF/ONAF cooling, designed for generator voltage operation to the plants medium voltage auxiliary buses, and equipped with an on load (OLTC) tap changer for energized operation on the high-voltage winding. The transformers shall comply with ANSI Standard C57.12.00. The transformer shall be able to deliver their rated output at all tap positions without exceeding the rated temperature rise.

4.5.3.2 The noise from the transformer shall not exceed the levels indicated in NEMA Standard TR-1.

4.5.4 Isolated Phase Bus Duct:

4.5.4.1 The isolated phase bus shall interconnect the following:

- Generator
- Main power transformer
- Auxiliary transformer

- 4.5.4.2 The bus enclosure shall utilize a forced air cooling system encompassing redundant fans, filters, air dryers, etc., and shall be maintained at positive air pressure. Redundant pressure switches shall be provided to monitor the enclosure pressure and shall activate an alarm at the DCS in the event of low air pressure in the enclosure
- 4.5.5 The temperature rise, at rated current, above ambient temperature of 40°C of air surrounding the bus enclosures and cubicles, shall be in accordance with ANSI C37.23, Table 1.
- 4.5.6 Medium and Low Voltage Switchgear and Motor Control Centers (MCCs):
 - 4.5.6.1 The medium voltage switchgear shall consist of medium-voltage circuit breakers and medium-voltage fusible starters arranged lineups.
 - 4.5.6.2 The LV system shall be furnished with grounding resistor(s) rated at 5 Amps continuous. The transformers shall be of ventilated dry type.
 - 4.5.6.3 The MCCs shall consist of magnetic-only circuit breakers and starters.
 - 4.5.6.4 Provisions shall be made to facilitate the lock out of the circuit breakers and starters in the off position.
- 4.5.7 Motors:
 - 4.5.7.1 The medium voltage motors shall include those rated above 250 hp. The low voltage motors shall include those rated 250 hp and less. The motor nameplate horsepower multiplied by the motor nameplate 1.15 service factor shall be at least 20% greater than the driven equipment operating range maximum brake horsepower.
 - 4.5.7.2 Motors shall be designed for full voltage starting and frequent starting where required, and shall be suitable for continuous duty in the specified ambient. The motors insulation shall be Class F and shall be operated with Class B temperature rise.
 - 4.5.7.3 Each medium voltage motor shall be furnished with bearing and winding temperature detectors to be wired to the DCS for monitoring and alarm functions.
 - 4.5.7.4 The motors' stator winding shall be form wound and the rotor shall be constructed with copper bars. Sleeve type bearings shall be provided.
- 4.5.8 Protection Relays System:
 - 4.5.8.1 Digital protection systems designed in accordance with IEEE C 37.102 , IEEE C 37,101, and IEEE C 37.106 shall be provided for:
 - Generators
 - Generator Circuit Breakers
 - Transformers
 - Medium Voltage Switchgear

- Low Voltage Switchgear
- Medium Voltage Motors

- 4.5.8.2 The protection relays for the generators and transformers shall be mounted in dedicated relay protection cabinets. The protection relays for the medium voltage switchgear, low voltage switchgear and medium voltage motors shall be located on the respective switchgear.
- 4.5.8.3 The protection relays shall be microprocessor based multi-function type and shall be provided with multiple functions that can be selectively used or disabled.

4.5.9 Essential Service AC and DC Systems:

- 4.5.9.1 The essential-service AC and DC system consists of two subsystems, essential-service ac and essential-service DC. The essential-service ac subsystem provides low-volt AC, single-phase power to essential control, instrumentation, and equipment loads that require uninterruptible ac power. The essential-service DC subsystem provides a reliable source of power for the essential-service AC subsystem and critical control and power functions during normal and emergency plant operating conditions.
- 4.5.9.2 The essential service DC system shall be of ungrounded type two batteries each furnished with two chargers. The batteries shall be sized to supply full projected load for no less than 4 hours after loss of charging system.
- 4.5.9.3 The essential AC system shall include an uninterruptible power supply (UPS) system.

4.5.10 Lighting Systems:

- 4.5.10.1 The lighting system shall provide illumination for plant operation under normal conditions, and emergency lighting to perform manual operations during outage of the normal power source.
- 4.5.10.2 The area lighting system shall provide illumination for the performance of general yard tasks, safety, and plant security.

4.5.11 Cable and Raceway Systems:

A cable and raceway system shall be installed to interconnect the individual equipment in the plant. The function of the raceway system shall be to enclose, contain, and protect electrical power, control, and instrument circuits; various pieces of equipment; devices; cabinets; and structures.

4.5.12 Grounding and Lightning Protection System:

The grounding system shall consist of bare, stranded copper cable buried in the soil below the ground-floor concrete slab and spaced in a grid pattern sized as required for safe step-and-touch potentials. A sufficient number of ground rods shall be installed and welded exothermically to the grid to assure a low-resistance earth connection. These rods shall be situated throughout the grounding system to minimize voltage gradients that occur during faults.

4.5.13 Lightning Protection:

The lightning protection system shall be in accordance with the latest applicable NFPA Standard 780 and ANSI/UL Standard 96A.

4.5.14 Cathodic Protection System:

The cathodic protection system shall control electrochemical corrosion on the external surfaces of designated metal piping buried in the earth; bottoms of above-ground pad-mounted steel tanks; wetted metal surfaces of the intake structures; interior surfaces of condenser and heat exchanger water boxes; and interior surfaces of designed, steel water storage tanks.

4.5.15 Transmission Interconnection

4.5.15.1 The electrical systems must be designed and constructed to comply with all North American Reliability Council and MISO requirements, and must meet the applicable requirements of the transmission owner at the point of interconnection

4.5.15.2 The generator must include all relays, meters, power circuit breakers, synchronizers and other control and protective apparatus that are reasonably necessary for proper and safe operation of the units in parallel with the transmission system.

4.6 Communication Systems:

The plant communications system shall provide the station personnel associated with the operation of the plant with a reliable and convenient means of plant paging and communication.

4.7 Instrumentation and Control Systems

4.7.1 Distributed Controls and Monitoring Systems

4.7.1.1 The control and monitoring functions shall be implemented in a microprocessor based distributed control systems (DCS). The DCS shall also include provisions for interface via redundant Ethernet data links with control and monitoring systems furnished by equipment suppliers utilizing distributed microprocessor-based systems or Programmable Logic Controllers (PLCs).

4.7.1.2 The DCS controllers shall be dual redundant with one in operation and the other in standby. Transfer between the two controllers shall be bumpless. The same criterion applies to the DCS power supplies. Triple redundant approach shall be employed for the field devices, where two-out-of-three logic is implemented for the switches and the median select (not the highest and not the lowest) is employed for the analog measurements. The redundancy shall include the capability to implement on line program and system configuration changes.

4.7.1.3 The DCS shall include a self-diagnostics system that detects source of internal failures down to the input/output subsystem level. When faults are diagnosed, a message shall be capable of being displayed on the

CRT screen identifying the source and location of a failure, thus assisting the maintenance personnel in clearing the faults.

4.7.1.4 The DCS shall perform all system performance calculations, alarm and Sequential Event Recording (SER).

4.7.1.5 The graphic display system shall have the capability and functionality to monitor the total DCS and all systems interfaced to it.

4.7.2 Steam Turbine Control System

The turbine control system (TCS) shall include provisions for manual control as well as automatic turbine start-up, auto synchronizing, and loading functions. The automatic start-up functions shall include pre-checks to ensure that the automatic start-up initiation conditions are satisfied; automatic turbine control from turning gear to target load at maximum rate compatible with the thermal state of the turbine, the steam inlet conditions and the allowable expenditure of turbine life expectancy.

4.7.3 Steam Turbine Supervisory Instrumentation

The turbine supervisory instrumentation (TSI) shall monitor, as a minimum:

- Bearing X-Y Relative Vibration for all turbine generator bearings.
- Bearing X-Y Absolute Vibration for all turbine generator bearings.
- Eccentricity
- Reference Detector A & B
- Turbine Speed A & B
- Case Expansion Left/Right
- HP Differential Expansion A & B
- LP Differential Expansion A & B
- Rotor Position A & B

4.7.4 Continuous emissions monitoring system (CEMS)

4.7.4.1 The CEMS shall measure emissions and produce all required data logging and reporting in accordance with the applicable State and Federal regulations. The analyzer system shall include extractive analyzers, sample probes, sample conditioning, heated sample lines where required, a fully programmed controller, calibration gas bottles for zero and span, calibration accessories, and mounting hardware for installation to provide a complete and operable system.

4.7.4.2 The data logging and reporting system shall store a minimum of three (3) years of data and automatically produce reports as required.

4.7.5 Vibration Monitoring

All large rotating machinery driven by medium-voltage motors shall have vibration and thrust monitoring. The application of monitoring equipment shall be subject to

the size and type of rotating equipment.

4.7.6 Field mounted Instruments

All field mounted instruments that are necessary for the plant protection, control and monitoring shall be provided. These shall include:

- Thermocouples and Resistance Temperature Detectors
- Transmitters
- Flow Elements
- Temperature, Pressure and Level Switches
- Level Switches
- Local Indicators

4.8 Condensate & Feedwater Systems

4.8.1 Condensate

4.8.1.1 Three 50% or two 100% condensate pump sets.

4.8.1.2 All system data points and alarms routed to control room.

4.8.1.3 A recirculation valve shall be provided to maintain minimum flow through the condensate pumps. The recirculation flow is routed to the condenser hotwell. Hotwell level shall be controlled automatically. Excess condensate is returned to the condensate storage tank. Demineralized water is supplied to the hotwell when the level drops below a predetermined level.

4.8.1.4 Condensate/start up polishing filter system with automatic control either locally or from control room (designed for automatic regeneration with no service restriction).

4.8.2 Feedwater

4.8.2.1 Two 100% feedwater pumps shall be provided for each HRSG with IP feedwater takeoff from each pump. These pumps shall be horizontal, volute, and multiple stage ring section pumps in accordance with Hydraulic Institute Standards. Double-bearing design shall be used with bearings on either side of the impellers. Impellers shall be stainless steel.

4.8.2.2 On each boiler feed pump discharge a manual stop-check valve arranged in series shall be provided. A warm-up line tapped off each discharge line, downstream of the stop-check valve, for warming the boiler feed pump while in a standby mode of operation shall also be provided.

4.8.2.3 A pressure breakdown orifice shall be provided in each warming line to help match the internal pressure in the pump casing while isolated from the feedwater discharge header.

4.8.2.4 Each pump shall be provided with a minimum flow control system to meet the minimum flow requirements

4.8.2.5 Two 100% capacity economizer re-circulation pumps.

- 4.8.2.6 All chemical injection, sampling and monitoring points easily accessible for routine maintenance.

4.9 Steam Condensing

4.9.1 Steam Surface Condenser (if applicable)

- 4.9.1.1 A steam surface condenser shall be designed for continuous operation based on an 85% cleanliness factor and in accordance with Heat Exchanger Institute (HEI) standards. The condenser materials shall be copper-free and selected appropriately to match the cooling water quality, i.e., fresh water or gray water, and designed to provide 30 year life. The condenser tubes and tube sheet shall be designed with appropriate isolation and cathodic protection system. Tubes in the air removal section shall be stainless steel.
- 4.9.1.2 Split condenser waterboxes with inlet and outlet entry doors adequately sized and located for routine maintenance. Inlet condenser tube sheet base designed to support ease of entry for routine cleaning (configured to help catch debris and not allow it to fall back into inlet piping).
- 4.9.1.3 Ability to remove one condenser half from service for maintenance with minimal steam turbine generator curtailment.
- 4.9.1.4 Condenser designed and sized with an automatic steam bypass system able to prevent a combustion turbine and/or HRSG trip after loss of the steam turbine. Condenser shall be designed to exceed HEI tube support requirements for bypass operation. The system shall be fully automatic with no operator actions required and designed for cyclic operation with no leakage.
- 4.9.1.5 Fully redundant steam hogging and holding systems adequately sized for start up and on line operation (including automated steam pressure control).

4.9.2 Circulating Water System (if applicable)

- 4.9.2.1 Two 50% pumps with one warehouse spare rotor. Pumps shall be of the heavy-duty type suitable for continuous service under all operating conditions and shall operate without undue strain or wear and without damage to any part of the pumping unit. The critical speed of the complete rotating unit (motor and pump) shall be at least 25% above the operating speed.
- 4.9.2.2 The circulating water pump basin shall meet the suction requirements of the Hydraulic Institute. Alarms for high- and low-levels in the cooling tower basin shall be provided in the main control room.

4.9.3 Cooling Tower (if applicable)

- 4.9.3.1 The evaporative cooling tower shall be of the counterflow type. The cooling tower shall be capable of cooling the water flow from the hot water temperature entering the tower to the cold water temperature exiting the tower, at the design ambient wet bulb temperature, dry bulb temperature over the full range of operating conditions including duct

firing and full bypass mode. Plastic materials (PVC and CPVC) used in tower construction shall be of special formulations to promote rigidity and shall be low in plasticizers and highly resistant to ultraviolet exposure.

- 4.9.3.2 Structural members shall be composite fiberglass or concrete.
 - 4.9.3.3 The water distribution system shall be capable of operating with water quantities varying between 15% below and 15% above the design water flow per tower cell or quadrant. The distribution of water to individual nozzles shall be such that the flow to each nozzle shall not deviate from the average flow per nozzle by $\pm 5\%$.
 - 4.9.3.4 Fill material shall be of sufficient thickness and be adequately supported so that it is rigid enough not to sag, up to a water temperature of 140°F.
 - 4.9.3.5 Isolatable cells designed to accommodate routine on line cleaning and maintenance activities.
 - 4.9.3.6 No cooling tower drift impacts to plant equipment, operations or offsite. Drift eliminators shall be multi-pass type to limit drift to a maximum guaranteed value 0.002%
 - 4.9.3.7 On line cooling tower performance monitoring and energy management system desired (two speed fans).
 - 4.9.3.8 Tower make up, blow down, chemical injection and monitoring equipment automated and accessible for routine maintenance.
 - 4.9.3.9 A complete fire protection system shall be provided for the tower, including stairways. The system shall be of the dry deluge type designed in accordance with National Fire Protection Association (NFPA) 214
 - 4.9.3.10 Two 100% chemical injection pumps and chemical storage adequate for 14 days of full load operation shall be provided for each chemical injection system.
 - 4.9.3.11 Hoisting crane (small) attached to top platform to support maintenance activities.
 - 4.9.3.12 Tower designed and located to provide crane access for picking fans, blades and motors.
- 4.9.4 Air-Cooled Condenser (if applicable)
- 4.9.4.1 The air-cooled condenser shall be sized to meet the performance guarantee including a 15% margin above the maximum heat rejection load and shall be capable of operating continuously in the full steam turbine bypass mode.
 - 4.9.4.2 Surface coatings, including structural steel and fan deck plate-work to be galvanized; stair treads, grating, handrails, and walkway surfaces to be galvanized; steam ducting, steam headers, and piping to be outside primer-coated; and partition walls, windwalls, and siding with finish coating

- 4.9.4.3 Noise attenuation features/devices including windwalls, if necessary
- 4.9.4.4 Over-pressurization rupture disc shall be provided.
- 4.9.4.5 Vacuum breaker system complete with one motor-operated vacuum breaker, discharge piping, debris cover, and all other required components to complete the system.

4.10 Closed Cooling Water System

- 4.10.1 All equipment heat exchangers shall be cooled through a closed cooling water system
- 4.10.2 The cooling water heat exchangers and pumps shall be sized to supply adequate cooling water to the closed loop system under full operating load with the maximum site ambient conditions. The system design shall permit shutdown and maintenance of the individual items of equipment without interruption of the cooling function of the rest of the system. The closed cooling water system shall be designed for removing the maximum heat rejected from all the auxiliary equipment using an auxiliary cooling water system or air cooled heat exchangers.
- 4.10.3 Three 50% closed cooling water pumps shall circulate the cooling water through the closed system. The heat exchangers shall provide the means for dissipating heat to the atmosphere via the wet cooling tower. The closed cooled water shall consist of a chemically treated water solution with glycol as needed for freeze protection. An elevated water surge tank shall be provided for surge capability, system makeup, venting, and adequate net positive suction head (NPSH) for the closed cooling water pumps.

4.11 Auxiliary Cooling Water System (if applicable)

- 4.11.1 The system shall include auxiliary cooling water pumps, all piping, valves, instruments, and accessories as necessary for a complete operating system. Equipment materials and filters upstream of the heat exchangers shall be suitable for the water quality expected in the system. Seasonal introduction of debris shall be considered in the design of the filters upstream of the heat exchanges. The filters shall be self cleaning with automatic actuation on differential pressure. The pumps are to be located as an integral part of the wet cooling tower design in conjunction with the circulating water pumps.
- 4.11.2 Two 100% capacity supply pumps.
- 4.11.3 Two 100% capacity cooling water heat exchangers, each isolatable for routine cleaning and tube plugging without plant curtailment.
- 4.11.4 Make up water source of adequate supply and quality.
- 4.11.5 Automated chemical delivery/feed and monitoring system with chemical storage for 7 days of plant operation.
- 4.11.6 Two 100% capacity chemical injection pumps.

4.12 Make up Water Systems

4.12.1 Raw Water (CT & Demineralizer make up)

- 4.12.1.1 Adequate supply source available to support year round plant operation.
- 4.12.1.2 Source water quality and temperature within each application's specified requirements.
- 4.12.1.3 Makeup water treatment system to remove suspended solids as necessary and meet demineralizer inlet quality standards in accordance with demineralizer manufacturer recommendations
- 4.12.1.4 Media filtration systems (if used) to include redundant filters for offline backwashing.
- 4.12.1.5 Wastes from pretreatment system to be dewatered as necessary for land disposal in accordance with all solid waste disposal regulations.
- 4.12.1.6 Fully automated, instrumented and redundant pretreatment system.

4.12.2 Demineralized Water (condensate make up)

- 4.12.2.1 Demineralizer system to include two 100% trains or three 50% trains that meet EPRI Cycle Chemistry Guidelines with one train out of service for regeneration.
- 4.12.2.2 Common regeneration equipment to be used for all demineralizer trains.
- 4.12.2.3 All water treatment and regeneration equipment fully enclosed and climate controlled.
- 4.12.2.4 System able to produce a minimum of 110% of plant's maximum daily consumptive water use.
- 4.12.2.5 Demineralized water storage capacity sufficient to support a minimum five days of plant service including two start/stop cycles per day.
- 4.12.2.6 Building adequately sized and designed for ease of removal of large equipment (roll up doors, overhead crane & trolley).
- 4.12.2.7 All piping, storage tanks, equipment and materials designed to minimize corrosion and to meet specifications associated with water production and delivery.
- 4.12.2.8 All external piping and associated equipment insulated and traced as required given plant location.
- 4.12.2.9 Piping arrangement plumbed to allow for use of portable demineralizers.
- 4.12.2.10 Fully automated system with critical controls, instrumentation and alarms available both locally and into the control room (able to start, operate and stop unmanned).

4.13 Gas Conditioning Station

- 4.13.1 Station designed to deliver fuel at the quantity, pressure and quality required to meet OEM specifications, including applicable power augmentation operation. The Seller shall design, furnish, and install the natural gas filtering, compression equipment, and pipeline to accommodate the complete operating range of the turbine(s) without affecting the stable operation of the facility. The fuel conditioning equipment shall process the fuel to meet the OEM requirements for the fuel to the equipment. The Seller shall supply individual fuel gas regulators and associated relief valves for the gas consuming components if necessary to prevent exceeding the manufacture's maximum allowable supply pressure to such components. If required by the manufacturer, the Seller shall furnish and install equipment necessary to heat the fuel to a temperature acceptable to the gas turbine manufacturer.
 - 4.13.2 Two 100% or three 50% electric driven gas compressors shall be supplied.
 - 4.13.3 Ability to change out filters and dryers on line with no supply restrictions.
 - 4.13.4 All valves and components designed and located for access for routine maintenance.
 - 4.13.5 Cathodic protection on gas pipeline to meet interconnection requirements or AGA as applicable.
- 4.14 Instrument and Service Air
- 4.14.1 Adequate dryers and filters to meet OEM quality specifications shall be provided. The instrument air system shall have adequate dryers and filters to meet OEM quality specifications. Two 100% heatless dryers with 2 x 100% filters shall supply dry (-40°F dew point at 125 psig), oil free air for use by control systems and instrumentation.
 - 4.14.2 Use of compressed air supplying the instrument air distribution header (via the instrument air dryer) for such auxiliary functions as purge air (except for instruments) is discouraged. Instrument air shall be provided in the Facility's instrument/maintenance shop.
 - 4.14.3 The station air system shall provide air for maintenance tools. The station air system shall be a separate distribution system which provides air for maintenance tools and shall have valved access points at convenient maintenance around the facility. The air shall be dry and clean.
- 4.15 Waste Water Treatment System
- 4.15.1 Designed to process and treat all waste streams in accordance with approved discharge permit requirements.
 - 4.15.2 If permitted for "zero discharge", system will be adequately designed and automated to minimize labor burden of plant staff.
 - 4.15.3 If permitted for "zero discharge", Seller will provide two independent sources for waste processing heat.

- 4.15.4 If permitted for “zero discharge”, related equipment designed to have capacity for at least 120% of maximum expected operating requirements.
- 4.15.5 100% redundancy for all critical chemical treatment and waste water processing pumps, motors and compressors.
- 4.15.6 Adequate chemical storage for 30 days of operation.

4.16 Fire Protection Master Plan and Design Basis

- 4.16.1 The Seller shall be responsible for the design and supply of fully operational fire protection systems supplied entirely in accordance with the applicable codes, standards, manufacturer's recommendations, product listings and this Specification. The fire protection systems supplied shall be designed in a consistent manner throughout the premises and all components shall be able to operate to meet all requisite functions in a consistent manner, to the satisfaction of both the purchaser and the local statutory authorities.
- 4.16.2 The Seller shall be responsible for preparing a Fire Protection Master Plan and Design Basis that will define the design requirement for fire protection. This shall consist of as a minimum the following documents:
 - a. Building and Fire Codes, and Life Safety Compliance Review Report
 - b. Fire Risk Evaluation Report
 - c. Hazardous Area Classification Evaluation

All three documents shall be submitted to the local statutory authorities and the Purchaser for review, comment and approval.

- 4.16.2.1 Building and Fire Codes, and Life Safety Compliance Review – The Review shall be performed by a qualified fire protection and engineering firm experienced in the preparation of fire protection master plans, building code reviews and reports and exit/egress analysis calculations and diagrams. The report shall identify and address for each building, pre-engineered and/or pre-fabricated building, equipment enclosure and/or structure at a minimum the following:
 - a. Applicable building and fire codes, standards, recommendations and amendments.
 - b. Building classification, occupancy and permitted construction types.
 - c. Building height and area limitations.
 - d. Fire resistance requirements for floors, exterior and interior walls and structural supports.
 - e. Egress and exiting requirements.
 - f. Detailed exit analysis and calculations. Prepare exit analysis drawings documenting occupant loads, required exit widths, occupant load distribution and travel distances.
 - g. Combustible and flammable gases and liquids process equipment and storage fire protection, quantity limitations, and storage requirements.

- h. Accessibility requirements.
- i. Fire Department access and fire fighting facilities.
- j. Occupancy and area separation requirements.
- k. Fire alarm and detection systems.
- l. Sprinkler/Standpipe and fire hose station requirements (duration, flows, pressures and densities).
- m. Fire protection water supply and storage requirements.
- n. Emergency power and lighting requirements.
- o. Smoke control and ventilation requirements.
- p. Elevator Requirements

4.16.2.2 Fire Risk Evaluation - A NFPA 850 fire risk evaluation shall be initiated as early in the design process as practical to ensure that the fire prevention and fire protection recommendations as described in this document have been evaluated in view of the plant-specific considerations regarding design, layout, and anticipated operating requirements. The evaluation shall result in a list of fire prevention features to be provided based on acceptable means for separation or control of common and special hazards, the control or elimination of ignition sources, and the suppression of fires. The fire risk evaluation shall be approved by the owner prior to final drawings and installation.

4.16.2.3 Hazardous Area Classification Evaluation - The basis for classification evaluation shall be NFPA 70 (National Electrical Code [NEC]), NFPA 497, API 500, vendor information and other standards, as applicable.

4.17 Metering

4.17.1 All fuel and electric use meters shall be revenue grade designed, calibrated and installed to conform to required standards.

4.18 Exterior Equipment

4.18.1 All outdoor equipment and materials designed and installed consistent with expected use and environmental conditions (e.g. moisture & dust controls, cooling and ventilation, heat tracing and insulation for electrical motors, cabinets/load centers, sample, trap and chemical feed lines, etc.)

4.19 Property, Buildings and Roads

4.19.1 The Seller shall supply and install all buildings as required for the facility. These buildings shall include the combustion turbine and steam turbine area, administration, central control room, maintenance/shop area, warehouse area, storage area, first aid room, laboratory, water treatment area, chemical feed/sample panel equipment, electrical equipment building, etc.

4.19.2 Power block building to enclose the combustion turbine(s) and steam turbine(s) with overhead cranes and interior lay-down area sufficient for all overhauls.

- 4.19.3 Centralized structures with control room, offices, warehouse, file storage, lunch room and maintenance shops in close proximity to each other and in close proximity to the combustion turbine and steam turbine building
- 4.19.4 Office space, file storage area, warehouse and control room sized appropriately for 30 year plant service life.
- 4.19.5 Warehouse and maintenance shops designed with roll up doors to accept large pieces of equipment.
- 4.19.6 All HVAC and ventilation systems throughout the plant sized and installed appropriately for climate and dust control.
- 4.19.7 All buildings, structures and equipment designed and built to required seismic specifications.
- 4.19.8 The plant roads shall be asphalt concrete on sub-base of properly stabilized soil aggregate mixture. The paving and sub-base thickness shall be based on design and construction traffic loads. The main plant road shall be minimum 25 feet wide. Road inside of the switchyard area may be rock (suitable for purpose) surfaced only. All road surfaces designed and paved to allow for proper drainage and to allow transportation of heavy equipment and materials throughout the plant.

5.0 GENERAL

5.1 Design

- 5.1.1 All valves and valve actuators shall be accessible for operation and maintenance.
- 5.1.2 All plant equipment and facilities materials shall be designed and built to U.S. codes and standards.
- 5.1.3 All equipment foundations and concrete structures shall be designed and built per manufacturer's criteria, soil investigation, and geotechnical report. Soil stabilization, remediation, piles, etc. shall be provided as required for all plant facilities including buried lines and facilities as required by the geotechnical investigation report.
- 5.1.4 Concrete design shall be in accordance with the latest release of American Concrete Institute (ACI), codes 318, 350, and 530.
- 5.1.5 The steel structure to be used for pipe racks, the combustion turbine enclosures and warehouse/maintenance shop shall be designed, fabricated, and erected in accordance with American Institute of Steel Construction specification.
- 5.1.6 All 100% redundant plant equipment (pumps and motors) shall be fully isolatable to facilitate maintenance repairs or replacement.
- 5.1.7 Plant noise levels within permit specifications under all operating conditions.
- 5.1.8 Emergency lighting shall be provided in all areas of operation.

- 5.1.9 Overhead cranes or paved access and pads for mobile cranes with sufficient capacity for all overhaul activities. The general arrangement must be designed to allow for removal and replacement of all plant equipment.
 - 5.1.10 100% redundancy on CEMS sample and monitoring equipment and equipment accessible for maintenance.
 - 5.1.11 Enclosed hazardous waste storage and handling area sized and located for safe storage and ease of use.
 - 5.1.12 HRSG and steam attemperation isolation valves easily accessible for routine maintenance.
 - 5.1.13 Online water wash and drain system installed with all valves easily accessible for routine maintenance.
 - 5.1.14 Product water quality consistent with EPRI and OEM requirements.
 - 5.1.15 Site elevation graded to above 100 year flood level.
 - 5.1.16 Plant property lines identified and fenced with appropriate signage.
 - 5.1.17 480-Vac, 3-phase, 60A welding receptacles with integral on/off switches shall be located, as a minimum, at each HRSG platform, at grade near both ends of each turbine, and in all remote equipment locations and maintenance buildings, and shall not be located in classified areas.
- 5.2 Operation
- 5.2.1 Adequate water supply source available to support year round plant operation at full load. Source water quality and temperature within each application's specified requirements. The makeup water treatment shall be fully automated, instrumented and with redundant pre-filtering system. Adequate chemical storage shall be provided for 30 days of operation.
 - 5.2.2 Hoisting crane (small) on the air inlet to move filters and perform maintenance.
 - 5.2.3 Ability to change out dryer elements and filters on line with no plant curtailments.
 - 5.2.4 If permitted for "zero discharge", system will be adequately designed and automated to minimize labor burden of plant staff.
 - 5.2.5 If permitted for "zero discharge", Seller will provide a source of waste processing heat while the plant is offline, or a mobile wastewater processing capability.
 - 5.2.6 100% redundancy for all critical chemical treatment and waste water processing pumps, motors and compressors.
 - 5.2.7 Hazardous waste storage and handling area sized for safety and ease of shipping.
 - 5.2.8 Bulk hydrogen storage sufficiently sized for 2 generator purges and fills for each generator.

- 5.2.9 Bulk carbon dioxide storage sufficiently sized for 2 generator purges for each generator.
- 5.2.10 Adequate evaporative cooling water supply and storage for ten continuous days of operation, or proof of adequate backup supply. Water quality within recommended OEM specifications.

6.0 CODES AND STANDARDS

Systems and equipment shall be designed in accordance with Codes and Standards, Regulations, Governmental Approvals and Governmental Rules in effect at the date of execution of this Contract. Applicable sections of Governmental Rules will be referenced as required in the relevant technical specifications. In case of conflict among this Scope Document, referenced Governmental Rules, and manufacturer's standard practices, the Purchaser shall determine which will govern. Where there are no applicable Governmental Rules, power industry practices shall apply.

6.1 State and Local Building Codes, Standards and Ordinances

- 6.1.1 Code, Rules and Regulations of the State of Indiana, or applicable state.
- 6.1.2 Indiana Occupational Safety & Health Division (IOSH), or applicable state.
- 6.1.3 Local laws, ordinances, and regulations

6.2 U.S. Government Codes, Ordinances, and Standards

- 6.2.1 Occupational Safety and Health Act (OSHA) - 29 CFR 1910, 1926
- 6.2.2 Federal Aviation Agency (FAA) - Obstruction Marking and Lighting AC No. 70/7460-IJ)
- 6.2.3 Environmental Protection Agency (EPA) - 40 CFR 423, 40 CFR 60, 40 CFR 72, 40 CFR 75, 40 CFR 112
- 6.2.4 Appendix A to Part 36, "American Disability Act Accessibility Guidelines for Buildings and Facilities

6.3 American Society of Mechanical Engineers

The following standards of the American Society of Mechanical Engineers (ASME) shall be followed:

- 6.3.1 ASME Boiler and Pressure Vessel Code Sections:
 - I. Power Boilers
 - II. Material Specifications
 - Part A: Ferrous Materials
 - Part B: Nonferrous Materials
 - Part C: Welding Rods, Electrodes, and Filler Metals
 - III. Nondestructive Examination

VIII. Pressure Vessels Division 1

IX. Welding and Brazing Qualifications

6.3.2 ASME B31.1 - Power Piping

6.3.3 ASME Standard TDP-1 - Recommended Practices for the Prevention of Water Damage to Steam Turbines Used for Electric Power Generation, Part I - Fossil Fueled Plants

6.3.4 ASME Performance Test Codes:

The following performance test code may be used as guidance in conducting the performance for the overall facility:

- PTC 46 Overall Plant Performance
- PTC 1 General Instructions
- PTC -19.1 Measurement Uncertainty

6.3.5 The following performance test codes may be used as guidance in conducting performance tests if a shortfall in overall facility performance requires individual component testing:

- PTC - 4.4 Gas Turbine Heat Recovery Steam Generators
- PTC – 6.2 Steam Turbines in Combined Cycles
- PTC – 22 Gas Turbine Power Plants

6.3.6 American National Standards Institute

The following standards of the American National Standards Institute (ANSI) shall be followed:

- B16.1 Cast Iron Pipe Flanges and Flanged Fittings
- B16.5 Steel Pipe, Flanges, and Fittings
- B16.34 Steel Valves
- B30.17 Overhead and Gantry Cranes
- B133.8 Gas Turbine Installation Sound Emissions
- C2 National Electrical Safety Code
- C37.010 Application Guide for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis
- C37.04 Standard Rating Structure for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis

- C37.06 Switchgear - AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis -Preferred Ratings and Related Required Capabilities
- C37.13 Standard for low Voltage AC Power Circuit Breakers Used in Enclosures
- C37.20.1 Standard for Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear
- C37.20.2 Standard Metal-Clad and Station-Type Cubicle Switchgear
- C37.23 Guide for Metal-Enclosed Bus and Calculating Losses in Isolated-Phase Bus
- C37.30 Definitions and Requirements for High-Voltage Air Switches, Insulators, and Bus Supports
- C37.101 Generator Grounding Protection
- C37.102 AC Generator Protection
- C37.106 Abnormal Frequency Protection
- C50.41 Polyphase Induction Motors for Power Generating Stations
- C57.12.10 Transformers - 230 kV and below, 833/958 through 8,333/110,417 kVA Single Phase and 750/862 through 60,000/80,000/100,000 kVA Three Phase without Load Tap C Changing, and 3,750/4,682 through 60,000/80,000/100,000 kVA With Load Tap Changing- Safety Requirements
- C57.12.55 Transformers - Dry-Type Transformers Used in Unit Installation, Including Unit Substations
- C57.12.70 Terminal Markings and Connections for Distribution and Power Transformers
- C57.13 Standard Requirements for Instrument Transformers
- C57.109 Guide for Transformer Through-Fault-Current Duration
- C62.11 Standard for Metal-Oxide Surge Arresters for AC Power Circuits

6.3.7 Industry Standards

Applicable standards issued by the following industry organizations:

- American Association of State Highway and Transportation Officials (AASHTO)
- American Boiler Manufacturers Association (ABMA)
- American Concrete Institute (ACI)

- American Gas Association (AGA)
- American Gear Manufacturers Association (AGMA)
- American Institute of Steel Construction (AISC)
- American Iron and Steel Institute (AISI)
- Air Moving and Conditioning Association (AMCA)
- American Petroleum Institute (API)
- American Society for Nondestructive Testing (ASNT)
- American Society for Testing and Materials (ASTM)
- American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)
- American Water Works Association (AWWA)
- American Welding Society (AWS)
- Anti-Friction Bearing Manufacturers Association (AFBMA)
- Crane Equipment Manufacturer's Association of America (CMMA)
- Expansion Joint Manufactures Association (EJMA)
- Fluid Control Institute (FCI)
- Heat Exchange Institute (HEI)
- Hydraulic Institute (HI) - Standard for Pumps
- Illuminating Engineering Society (IES)
- Institute of Electrical and Electronics Engineers (IEEE)
- Insulated Cable Engineers Association (ICEA)
- Instrument Society of America (ISA)
- Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry
- Metal Building Manufacturers Association (MBMA)
- National Association of Corrosion Engineers (NACE)
- National Electrical Manufacturers Association (NEMA)

- National Fire Protection Association (NFPA) National Fire Codes
- Pipe Fabrication Institute (PFI)
- Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
- Steel Structures Painting Council (SSPC)
- Thermal Insulation Manufacturers Association (TIMA)
- Tubular Exchanger Manufacturers Association (TEMA)
- Underwriters Laboratories, Inc. (UL) - fire protection equipment only
- Welding Research Council (WRC)
- Electric Utility Requirements

6.3.8 Transmission and Gas Interconnections

- DUKE ENERGY INDIANA Interconnection Requirements
- Midwest Independent Transmission System Operator (MISO)
- Pipeline interconnect requirements for natural gas interconnection

Exhibit F - Project Information Request for Peaking and Intermediate Load Generation

SUBMITTAL REQUIREMENTS

Seller shall provide the following project information with the proposal:

1. State the technology/configuration being proposed, e.g. Combined Cycle Gas Turbine (1 x 1, 2 x 1, 3 x 1), Simple Cycle Peaker (Number of units).
2. Describe the proposed project site and plant general arrangement
 - a. Map showing site location, site access for personnel and construction deliveries, and key project facilities.
 - b. List the address and total site property size.
 - c. Identify neighboring property uses/owners.
 - d. Site property map showing the general arrangement of the plant with identification of major equipment and facilities.
3. Describe the control of all land parcels required for the project during construction and after the beginning of commercial operations
 - a. Status of current site control and terms of agreements if all land is not currently owned by project, e.g. ownership, leasehold interest, site option.
 - b. Include copies of documents proving site control and ability to build and operate project as proposed.
 - c. List the site's current zoning.
 - d. Will the project require lease or special use agreements with local, state or federal agencies, and if so, describe the status of obtaining these agreements.
4. Description of site conditions
 - a. Has a Phase I or Phase II Environmental Site Assessment been conducted for the property? Provide copies of the report(s), if available.
 - b. List and describe any corrective Action Consent Agency Agreements, or other agency actions associated with the site.
 - c. Describe any groundwater monitoring at the site and provide copies of the latest sample results.
5. Site's proximity to any environmentally sensitive areas.
 - a. Identify any known wetlands.

- b. Describe sensitive species and habitat surveys that have been completed or are planned in the project area and provide copies for those completed. If resource agencies have determined potential affects of the project action on sensitive species and habitat, please provide copies of the documents.
 - c. Describe any impacts to navigable waters of the United States due to the plant design or construction activities.
6. Describe the site's proximity to potentially sensitive receptors or culturally sensitive areas
 - a. List any cultural clearances obtained from state and federal agencies and any tribal interests in the project.
 - b. Describe the site's proximity to sensitive receptors, such as schools, churches, residential areas, commercial areas or areas of high security risk.
7. Air quality
 - a. If project site is in a non-attainment area for any criteria pollutant, describe the plans for obtaining offsets.
 - b. List the distance from the project site of all non-attainment areas within 100 miles of the project site.
 - c. List the distance from the project site of all Class 1 areas within 200 miles of the project site.
8. Current permitting status of the facility:
 - a. Provide a permit plan for the facility that identifies the permits required, status of approvals, and plans to finalize all required permits for construction and operation of the facility.
 - b. Provide copies of the final or draft permits that have been issued by regulatory agencies.
 - c. Summarize the status of any other permit or other agreements that place any conditions on construction or operations of the units, e.g. zero discharge requirement, air-cooled condenser requirement, use of grey water, noise or light restrictions, etc.
9. State whether an Environment Impact Statement will be required, the reasons why an EIS is required, and the plan and schedule for completing the EIS process.
10. If the project has received a draft or final air permit, provide copies of the permit and list the following:
 - a. Permit source and expiration date.

- b. Operating hours
 - c. Emissions limitations
 - d. Start/stop limitations
 - e. Minimum run times
11. If a draft air permit has not been prepared, list the emission controls that will be proposed for each criteria pollutant (NO_x, SO_x, CO, VOC, PM).
12. If an SCR will be used,
- a. Verify aqueous ammonia or urea will be used as sorbent and specify the percent solution.
 - b. Describe the sorbent storage and delivery plans and if the current status or plans for accidental release modeling and community emergency planning, if applicable.
13. Water supply and wastewater discharge
- a. Describe the water supply and wastewater discharge plan
 - b. Provide a water balance for annual average and annual maximum water consumption with
 - i. the quantities and sources of water supply and wastewater source of water by use, i.e. cooling water, water injection, inlet cooling steam cycle make-up, potable water, etc.
 - ii. the quantities and sources of wastewater and the treatment process
 - iii. wastewater disposal and outfall locations
14. If project has started construction, describe completion schedule and status of engineering, equipment procurement and construction.
15. Provide a description for all major equipment components including: CTG, STG, HRSG, plant control system, air emissions control equipment, generator step-up and auxiliary transformers, switchgear, fuel compressor module and gas conditioning, cooling systems, major pumps, water treatment system, fuel storage facilities, etc.
- a. Equipment manufacturer/model/date of manufacture.
 - b. Equipment source, e.g. existing owned inventory, new manufacturer order, resale market purchase.
 - c. Verify that all equipment will be new with no operations prior to installation at the site for the proposed unit.
 - d. Terms and expiration of warranties/guarantees.

16. Describe the unit design capabilities cycling service throughout the unit lifecycle:

- a. Describe specific design considerations and provide, where appropriate, specific design detail to confirm that the unit has been designed to accommodate frequent cycling. Components that should be specifically addressed include: combustion turbines, steam turbine systems, HRSGs, steam condensing systems, and water chemistry control systems. Comments should emphasize minimizing maintenance down time, thermal fatigue effects and associated wear and tear.
- b. Describe plant design to meet water balance requirements.
- c. Provide emissions data for the combustion turbine technology to demonstrate ability to meet permit limits.
- d. Discuss the size of the fleet of the proposed combustion turbine and its reliability history.

17. Describe any litigation or settlement agreement discussions applicable to the project

18. Natural gas supply

- a. Describe the proposed fuel gas interconnection point and status of the interconnection agreement process.
- b. State whether the interconnection facilities will require right-of-ways through federal or state lands.

19. Indicate whether the Preliminary Request for Gas Service has been applied for or completed.

- a. List the approximate distance to the fuel gas interconnection point.
- b. Identify the potential routes for the interconnection.

20. Transmission system interconnection

- a. List the point of interconnection into the transmission system - switchyard or substation, with primary equipment listed; interconnecting voltages and interconnecting transmission lines; bus configuration (collector bus, ring bus, breaker and a half).
- b. What is the approximate distance to the electric interconnection point?
- c. Provide a proposed transmission interconnection plan including any existing approvals or agreements. Describe anticipated transmission system upgrades, and milestone activities and timeline for interconnection approval.
- d. Discuss and summarize the status of the transmission interconnection process and of all studies completed

- e. State whether the transmission interconnection facilities will require right-of-ways through federal or state lands.
21. Describe the contracting plan for the project construction, including the engineering, major equipment procurement, site construction and equipment erection, and start-up and commissioning of the project. Provide a project organization chart that identifies the division of responsibility by the Participant staff and subcontractors for the major project scope items listed below:
 - a. Overall Project Management
 - b. Project Development
 - c. Permitting and Licensing
 - d. Engineering, Procurement and Construction Management
 - e. Major Equipment Procurement
 - f. Engineering,
 - g. Mechanical construction
 - h. Electrical construction
 - i. Civil construction
 - j. Start-up and commissioning
 - k. Plant operations and maintenance (PPA only)
22. For each of the organizations shown on the project organization chart, provide examples of completed projects and the specific scope performed by the Participant or subcontractor relevant to their associated scopes for this project. Example projects of interest include similar scope responsibilities on power plant projects with similar technology and projects developed and built in North America.
23. List the Participant's proposed management team, including the management team for all subcontractors listed on the project organizational chart. Provide resumes for the management team that include discussions of their specific responsibilities for the projects listed in the response to Question 21, as well as for other similar projects.
24. Submit a detailed critical-path schedule for the project development through final acceptance, consistent with your proposal. The schedule should be based on an assumed authorization-to-proceed date of February 15, 2008. The schedule shall include the logical sequencing of tasks and show the critical path tasks required to completed the following major project activities:

- a. Site procurement
 - b. Preliminary design
 - c. Water supply and wastewater discharge plan
 - d. Transmission and gas interconnection
 - e. Permitting and licensing
 - f. Engineering and contractor selection and contract negotiation
 - g. Project financing
 - h. Major equipment procurement, fabrication and shipping
 - i. Detailed engineering
 - j. Site development and civil works
 - k. Major equipment erection
 - l. BOP plant construction and installation
 - m. Start-up and commissioning
 - n. Performance testing and acceptance
25. Include a projected cost pro forma for the Offer which includes at least the following:
- a. Capital budget with cost breakout for major components.
 - b. Proposed spare parts inventory.
 - c. Plant O&M staffing plan with budget showing the following:
 - i. Plant organization chart. Include a proposed O&M shift organization and headcount.
 - ii. Staffing buildup plan. For the proposed staffing shown in the organization chart, prepare a plant hiring plan for the 12 months prior to the Guaranteed Commercial Availability Date.
 - iii. Indicate any staffing augmentation that may be necessary during plant startup and performance testing.
 - iv. Prepare a staff training plan for the proposed O&M organization.
26. Describe the potential for additional generation development at the site.
27. Describe the assumptions used in the developing the summer peak and annual average conditions [or other conditions, consistent with performance guarantee cases]for heat rate and net generating capacity

estimates

- a. Identify the location and mean elevation of the weather station used as the basis of the ambient conditions and the distance of the weather station from the project site.
- b. Provide the historical dry bulb temperature and relative humidity data used in calculating the peak and average conditions.

28. List the design criteria used as the basis for the

- a. Site elevation and standard barometric pressure
 - i. ____ Site Mean Elevation Above Mean Sea Level, ft
 - ii. ____ Site Standard Barometric Pressure at Site Mean Elevation, psia
- b. The outdoor operating temperature range for all equipment:
 - i. ____ °F, Minimum Dry Bulb Temperature
 - ii. ____ °F, Maximum Dry Bulb Temperature
- c. Rainfall, inches
 - i. ____ in., Two-year, 24-hour Maximum
 - ii. ____ in., 10-year, 24-hour Maximum
 - iii. ____ in., 100-year, 24-hour Maximum
- d. Snow Load
____ pounds per square foot, Maximum Snow Load
- e. Wind
 - i. ____ miles per hour, Design Wind Velocity
- f. Seismic
 - i. ____ Seismic Zone
 - ii. ____ Soil Profile Type
 - iii. ____ Seismic Coefficient, C_a
 - iv. ____ Seismic Coefficient, C_v

29. Provide the fuel analyses used for the performance guarantees and emission estimated for all fuels proposed for the project.
30. Provide heat balance diagrams for summer peak and annual average conditions or other conditions, consistent with performance guarantee cases] at the Site Standard Barometric Pressure for the following net plant loads:
 - a. Maximum Output with Duct Firing and Inlet Cooling (mechanical chilling or evaporative) (Peak Load), if applicable
 - b. Maximum Output with Duct Firing, if applicable
 - c. Base Load Output
 - d. 75% of Maximum Output
 - e. 50% of Maximum Output
 - f. Minimum Load
31. For each of the heat balance cases listed in Question 30, provide the uncontrolled and controlled emissions estimates in lb/mmBtu for operations on each fuel for all criteria pollutants (NO_x, SO_x, CO, VOC, PM).
32. Provide the CT manufacturer's major maintenance schedule for the CT's proposed for this offer.