

August 20, 2014

***VIA ELECTRONIC FILING  
AND OVERNIGHT DELIVERY***

Washington Utilities and Transportation Commission  
1300 S. Evergreen Park Drive S.W.  
P.O. Box 47250  
Olympia, WA 98504 7250

Attn: Stephen V. King  
Executive Director and Secretary

**RE: Docket No. UE-14\_\_\_—Affiliated Interest Filing—PacifiCorp and Metalogic  
Inspection Services LLC Notice**

Dear Mr. King:

Under the provisions of RCW 80.16.020 and in accordance with WAC 480-100-245, Pacific Power & Light Company, a division of PacifiCorp (PacifiCorp or Company), provides this notice of an affiliated interest transaction with Metalogic Inspection Services LLC (Metalogic) for the provision of Linear Phased Array (LPA) examinations of boiler tubing welds and general non-destructive evaluation (NDE) services at certain Company generation facilities. Included with this filing as Attachment A is a copy of the Master General Services Agreement between Berkshire Hathaway Energy Company and Metalogic Inspection Services for Boiler, High Energy Piping, Unfired Pressure Vessel, Non-destructive Inspection and Evaluation Services (Agreement). Exhibit B to the Agreement contains confidential pricing information, which the Company is contractually obligated to keep confidential. Additionally, such pricing information is commercially-sensitive and could erode the Company's bargaining power for similar services in the future. The Company submits Exhibit B as confidential in accordance with WAC 480-07-160.

PacifiCorp is an indirect wholly owned subsidiary of Berkshire Hathaway Energy Company (BHE). Metalogic is also a wholly owned subsidiary of BHE. RCW 80.16.010 includes in its definition of "affiliated interest," "every corporation five percent or more of whose voting securities are owned by any person or corporation owning five percent or more of the voting securities of such public service company or by any person or corporation in any such chain of successive ownership of five percent or more of voting securities." BHE's ownership interest in both the Company and Metalogic creates an affiliate interest.

The Agreement was negotiated between BHE and Metalogic. BHE subsidiaries may take services under the Agreement by executing a participation letter. The Company intends to execute such a participation letter in the near future.

Metalogic provides certain metallurgical testing and evaluation services, including LPA and NDE. LPA is an ultrasonic technique of examining boiler tubes, welding, and is conducted during performance of Company boiler overhaul repair. NDE examination services provide inspection, professional recommendation, and reporting on Company boilers. BHE conducted a formal bid process and selected Metalogic after it achieved the highest score as evaluated against the required LPA scope of work. The Company expects to spend approximately \$600,000 over three years.

PacifiCorp's participation in the Agreement is in the public interest. PacifiCorp owns and operates thermal generation plants that require periodic inspection and testing to ensure efficient operation. Period evaluation and testing of boiler tubes and welding is an important part of the ongoing inspection and testing needs.

Included with this filing is a notarized verification from Michelle R. Mishoe, Senior Counsel, regarding the Master General Services Agreement between Berkshire Hathaway Energy Company and Metalogic Inspection Services for Boiler, High Energy Piping, Unfired Pressure Vessel, Non-destructive Inspection and Evaluation Service.

Please contact Natasha Siores at 503-813-6583 if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "R Bryce Dalley /w/s".

R. Bryce Dalley  
Vice President, Regulation

Enclosures

**WASHINGTON AFFILIATED INTEREST FILING**

**ATTACHMENT A**

**MASTER PROFESSIONAL SERVICES CONTRACT**

**MASTER PROFESSIONAL SERVICES CONTRACT**  
**BETWEEN**  
**BERKSHIRE HATHAWAY ENERGY COMPANY**  
**AND**  
**METALOGIC INSPECTION SERVICES LLC**  
**FOR**  
**BOILER, HIGH ENERGY PIPING, UNFIRED PRESSURE VESSEL, NON-DESTRUCTIVE**  
**INSPECTION AND EVALUATION SERVICES**

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EXHIBIT A – SCOPE OF WORK

- ATTACHMENT 1, LINEAR PHASED ARRAY SERVICES
- ATTACHMENT 2, INTENTIONALLY DELETED
- ATTACHMENT 3, INTENTIONALLY DELETED
- ATTACHMENT 4, GENERAL NON-DESTRUCTIVE EVALUATION SERVICES
- ATTACHMENT 5, INTENTIONALLY DELETED
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- ATTACHMENT 8, INTENTIONALLY DELETED
- APPENDIX A-1, SPECIAL CONDITIONS – PACIFICORP
- APPENDIX A-2, SPECIAL CONDITIONS – MIDAMERICAN ENERGY COMPANY
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- EXHIBIT B-1, LINEAR PHASED ARRAY SERVICES
- EXHIBIT B-2, INTENTIONALLY DELETED
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EXHIBIT D – LETTER OF CREDIT REQUIREMENTS

EXHIBIT E – AFFILIATES LIST AND PRINCIPAL BUSINESS ADDRESS

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EXHIBIT G – STATUTORY FORM OF LIEN AND CLAIM RELEASE FOR CALIFORNIA WORK

**MASTER PROFESSIONAL SERVICES CONTRACT****BETWEEN****BERKSHIRE HATHAWAY ENERGY COMPANY****AND****METALOGIC INSPECTION SERVICES LLC****FOR****BOILER, HIGH ENERGY PIPING, UNFIRED PRESSURE VESSEL, NON-DESTRUCTIVE  
INSPECTION AND EVALUATION SERVICES****PARTIES**

The Parties to this Master Professional Services Contract (this “Master Contract”) are **Berkshire Hathaway Energy Company** whose principal address is 666 Grand Avenue, P.O. Box 657, Des Moines, Iowa 50306-0657 (“Berkshire Hathaway Energy”), together with its Affiliates who elect to utilize this Master Contract and agree to be bound by the terms and conditions as provided herein (each, individually, a “Company”), and **Metalogic Inspection Services LLC** (hereinafter “Consultant”), whose address is 1148 South Clarkston Street, Denver, Colorado 80210. With respect to this Master Contract or any individual Contract (as defined below) entered into as set forth herein, Company and Consultant are hereinafter collectively referred to as “Parties” and individually as a “Party,” as the context may require. This Master Contract sets forth the general terms and conditions for each individual Contract issued hereunder. Each individual Contract shall be evidenced by and include among other Contract Documents (as defined below), a specific Purchase Order issued by the applicable participating Affiliate. The following documents pertinent to a given transaction shall, together, constitute a separate contract (“Contract”) between the applicable Company and Consultant: (i) this Master Contract; (ii) the associated Purchase Order(s) (but without regard to any standard, pre-printed terms and conditions appended thereto); (iii) the Scope of Work; (iv) Company documents, Consultant documents or other documents (if any) that the Parties explicitly agree in writing should form a part of the Contract; and (v) any exhibits referenced in any of the foregoing documents (collectively, the documents listed above in items (i) through (v) shall collectively constitute the “Contract Documents”). Each Company entity that issues a Purchase Order under this Master Contract is solely liable and responsible for the obligations of “Company” assumed with respect to the applicable Contract Documents, and no other Company entity shall have any liability or responsibility for such obligations.

**ARTICLE 1. DEFINITIONS**

As used in this Master Contract and any individual Contract entered into hereunder, the following terms have the meanings set forth below. Unless another meaning is specifically required by another Contract Document, when the following capitalized terms are used in any Contract Document, such terms shall refer to the definitions set forth herein. All exhibits listed in the Table of Contents shall form a part of this Master Contract whether or not referenced in the master terms and conditions below.

**Affiliates** shall mean any entity: (i) of which Berkshire Hathaway Energy now or hereafter owns or controls at least fifty percent (50%) or more of the ownership interest; (ii) over which Berkshire Hathaway Energy exercises management control; or (iii) listed as an affiliated company on Exhibit E. Additional Affiliates may be added to or removed from Exhibit E at any time upon Consultant’s receipt of Notice from Company. Changes to Exhibit E are not required to be incorporated by a written amendment to this Master Contract. When placing an initial order for Services, or in conjunction with an initial Purchase Order, each Affiliate will execute and submit an Affiliate Participation Letter in the form of Exhibit F (“Participation Letter”).

**CIPS Covered Assets** shall mean any assets identified by Company as “critical assets” or “critical cyber assets,” as those terms are defined in the North American Electric Reliability Corporation Glossary of Terms. To the extent the Services, or any part thereof, to be performed by Consultant for Company or any of its Affiliates involves or requires access to CIPS Covered Assets, Consultant shall adhere to the requirements, as applicable, set forth in Appendices I,II and III of Exhibit A.

**Company** shall mean, with respect to any Contract, the participating Affiliate issuing the applicable Purchase Order.

**Critical Infrastructure Information** or **Protected Information** shall mean information concerning CIPS Covered Assets that: (i) relates to the production, generation or transmission of energy; (ii) could be useful to a person planning an attack on critical infrastructure; and (iii) provides strategic information beyond the geographic location of the critical asset, and which is

identified as Critical Infrastructure Information or Protected Information by Company.

**Customized Software** shall mean any Software developed by Consultant specifically for Company as part of the Services under the Contract Documents.

**Deliverables** shall mean those items that are incidental to or otherwise delivered in connection with the performance of the Services or the fulfillment of Consultant's obligations as provided in the Contract Documents, including without limitation, as applicable, Software, work product, drawings, specifications, manuals, calculations, maps, sketches, designs, tracings, notes, reports, data, models, samples, equipment and other materials.

**Force Majeure Event** shall mean a delay caused by any national or general strikes (but excluding strikes relating solely to the work force of Company, Consultant or a Subcontractor), fires, riots, acts of God, acts of the public enemy, floods, acts of terrorism, unavoidable transportation accidents or embargoes, or other events: (i) which are not reasonably foreseeable as of the date the Contract was executed; (ii) which are attributable to a cause beyond the control and without the fault or negligence of the Party incurring such delay; and (iii) the effects of which cannot be avoided or mitigated by the Party claiming such Force Majeure Event through the use of commercially reasonable efforts. The term Force Majeure Event does not include a delay caused by seasonal weather conditions, general economic conditions, changes in the costs of goods, or other items sufficiently in advance to ensure that the Services are timely completed in accordance with the Contract Documents.

**Licensed Software** shall mean any Software for which Company obtains a license from Consultant pursuant to the Contract Documents, including future revisions, enhancements or upgrades to such Software as may be provided by Consultant to Company or otherwise be made available from time to time.

**Material Adverse Change** shall mean, with respect to Consultant, if Consultant, in the reasonable opinion of Company, has experienced a material adverse change in Consultant's financial condition or Consultant's ability to fulfill its obligations under the Contract including, but not limited to, any such change that results in its inability to satisfy ARTICLE 9, CREDIT REQUIREMENTS or ARTICLE 10, SECURITY, including any event or circumstance that would give Company the right to terminate for cause pursuant to ARTICLE 33, TERMINATION FOR CAUSE.

**Net Replacement Costs** shall mean the "cost to cover" remedy available to Company in the event of a default by Consultant under the Contract. The Net Replacement Costs shall be calculated by: (i) subtracting the unpaid balance of the total price of the Services to be performed under the Contract from the costs incurred by Company to obtain a replacement consultant to complete the Services that Consultant was otherwise obligated to provide under the Contract (or the costs, internal or third-party, incurred by Company to complete such Services itself); and (ii) adding a sum for additional managerial, administrative, and other reasonable costs (internal and third-party) Company incurs as a result of Consultant's default.

**Notice** shall mean a formal written communication which, pursuant to the Contract, one Party must deliver to the other in order to invoke a Contract right set forth herein.

**Personnel** shall mean the employees, representatives and agents of Consultant, its Subcontractors, and any independent contractors who are employed or engaged to perform Services under the Contract Documents.

**Purchase Order** shall mean the document(s) containing the information set forth in ARTICLE 3, PURCHASE ORDERS, which is used to engage Consultant to perform Services pursuant to the terms and conditions set forth in this Master Contract. As used in the Scope of Work, the terms "Work Release" and "Release" shall have the same meaning as Purchase Order.

**Scope of Work** shall mean the requirements regarding the Services and Deliverables, as described in the exhibits forming a part of the Contract Documents, and including any additional requirements that, while not specifically described in the exhibits, are implied or reasonably required to complete the Services as so described.

**Service(s)** shall mean any labor, skill, advice or Deliverable provided to Company pursuant to the Contract Documents.

**Software** shall mean any software, whether in object code or source code form, including all accompanying documentation, delivered by Consultant to Company under the Contract.

**Subcontractor** shall mean any entity or person (including subcontractors of any tier, laborers and materials suppliers) having an agreement with Consultant or any other Subcontractor to perform a portion of Consultant's obligations under the Contract Documents.

**Term** shall mean the period commencing upon the full execution of the Contract and continuing thereafter until the date specified in the Contract Documents, unless earlier terminated as provided herein.

**Workers' Compensation Laws** shall mean the statutory requirements of the state and/or federal regulations (e.g., FELA, USL&H, Jones Act) where the Services are to be performed.

**Work Site** shall mean the location or locations where the Services are to be performed.

## **ARTICLE 2. DESCRIPTION OF WORK**

Consultant shall perform the Services in accordance with the Contract Documents. Consultant shall be solely responsible for the means, methods, and procedures of performing the Services, except as otherwise specifically provided in the Contract Documents. Except as otherwise specifically provided in the Contract Documents, Consultant shall provide and obtain all necessary licenses, permits, permissions, utilities and support services.

## **ARTICLE 3. PURCHASE ORDERS**

Each Purchase Order will identify and/or describe: (i) the Services including any key Deliverables required by Company; (ii) the Work Site; (iii) the completion date for the Services and any key Deliverables and any other schedule or completion milestones; (iv) whether the performance of such Services will require access to CIPS Covered Assets; (v) the designated representatives for each Party with respect to the Contract; (vi) project-specific invoicing instructions; and (vii) any other project-specific terms and conditions. These project-specific items may be stated in or attached to a Purchase Order, or incorporated by reference. The terms and conditions of this Master Contract shall apply to each Purchase Order and shall form a unique Contract, as supplemented by the project-specific terms and conditions of the other Contract Documents. The Contract Documents shall, together, constitute the entire agreement between the applicable Company and the Consultant with respect to any Services and Deliverables to be furnished under the Contract. A Purchase Order will be issued through the applicable Company's procurement system and will reference this Master Contract and the applicable Affiliate Participation Letter. Within one (1) business day of receipt, Consultant shall acknowledge all Purchase Orders placed by Company and accept or reject the Purchase Order as placed by Company. Any Purchase Order that is not rejected within one (1) business day of receipt from Company will be deemed to have been accepted and deemed confirmed by Consultant. Company may also require that a mutually executed document be used in lieu of, or in addition to, a Purchase Order. As used throughout this Master Contract, the term "Purchase Order" shall be construed to include any such mutually executed document.

## **ARTICLE 4. PERIOD OF PERFORMANCE**

Unless earlier terminated as provided herein, the terms and conditions of this Master Contract shall continue in effect, for any Contract agreed to after the execution hereof and prior to August 31, 2017, until final satisfactory completion of all Services thereunder, whether or not the Services are scheduled to be completed prior to the expiration of the foregoing date. The expiration of the foregoing date shall not impact the Parties' respective rights or obligations with respect to any Services authorized prior to expiration. Neither the completion of the Services nor any earlier termination of this Master Contract shall impact any warranties, indemnities, insurance requirements, confidentiality obligations, termination obligations or other obligations which by their own terms are intended to survive the completion of the Services, all of which shall continue in full force and effect after the termination or expiration of the Contract.

The Contract Documents shall specify a completion date for the Services and/or Deliverables, and may also specify critical interim schedule milestones that must be met by Consultant. Consultant shall proceed in accordance with such schedule requirements, and shall comply (as applicable) with the detailed schedule of Services and/or Deliverables included in (or developed in accordance with) the Contract Documents. Time and schedule requirements included within the Contract Documents are of the essence. By entering a Contract, Consultant confirms that the time and schedule stipulated in the Contract Documents is reasonable for performance of the Services. Unless Consultant's later performance is excused by the terms of the Contract Documents, Company shall have all of the rights and remedies available at law and in equity with respect to late performance. Consultant shall provide Notice to Company immediately once Consultant becomes aware that it will not be able to complete the Services or furnish applicable Deliverables pursuant to the schedule stipulated by Contract Documents.

## **ARTICLE 5. CONSIDERATION AND PAYMENT**

As full consideration for the satisfactory performance of Consultant's obligations under the Contract, Company will pay Consultant in accordance with the agreed pricing terms included in the applicable Contract Documents. Company will pay Consultant all undisputed amounts within thirty (30) days of receipt and approval of properly submitted invoice(s). Invoices shall be submitted, and payments shall be made, on a monthly basis or as otherwise set forth in the Contract Documents. In the absence of such payment schedules, invoices shall be submitted, and payments shall be made, for work satisfactorily completed by Consultant during the invoicing period. Consultant shall submit with each invoice such detail of Services performed and other supporting documents as required by Company to demonstrate completion of the invoiced Services.



All invoices shall include separate line item charges for each employee's name and skill classification responsible for Services under said invoice, hours worked on the project (billable hours), hourly rate and a subtotal cost by skill classification. Consultant shall not bill Company for a higher skill classification than is required for the Services. Consultant shall furnish reasonable back-up detail and documentation as requested by Company supporting each invoice line item charge. In order to comply with applicable regulatory requirements, Company may require cost and invoicing detail to be broken out in a specific manner. Consultant shall comply with all such invoicing requirements, as indicated in the Contract Documents, or as otherwise reasonably requested by Company.

All invoices shall reference the applicable Contract number. Consultant shall identify and clearly set forth on the invoice any discount for early payment. To the extent that Consultant must resubmit any invoice for failing to comply with the Company's invoicing requirements, any offer of a discount for early payment shall remain valid until such time as Company has received a proper invoice for payment. The total amount of consideration payable for the Services will be specified in the Contract Documents.

It is understood and agreed that each Affiliate participating in this Master Contract is individually and solely responsible for the payment and other obligations it assumes under any individual Contract. Neither Berkshire Hathaway Energy nor any other Affiliate shall have any obligations or liabilities, contractually or otherwise, for the payment obligations incurred by any other Affiliate(s) under a Contract issued under this Master Contract.

All invoices shall be addressed to the Affiliate that has entered a Contract at the address specified in the applicable Contract Documents. Additional Affiliates, which may elect to participate in and under this Master Contract after the effective date hereof, shall notify Consultant of the proper billing address for forwarding Consultant invoices.

Company may offset any such payment to reflect amounts owing from Consultant to Company or its Affiliates pursuant to this Master Contract or any other agreement between the Parties or otherwise. In addition, Company may withhold all payments otherwise due Consultant until such time as Consultant has provided any Performance Security required by the Contract Documents. If required by Company, the final payment shall not become due until Consultant has furnished Company a final release from all claims and demands arising out the Services in a form acceptable to Company.

Upon request by Company, Consultant shall also provide interim lien and claim releases executed by Consultant, and interim and/or final lien and claim releases executed by Subcontractors through the date of each invoice submitted.

For Services to be performed in California, any lien and claim release provided by Consultant shall be in the form attached as Exhibit G.

#### **ARTICLE 6. TAXES**

The consideration stated in the Contract Documents will include all taxes arising out of Consultant's performance hereunder, including without limitation state and local sales and use taxes, federal taxes, value-added taxes, import and customs duties, payroll taxes, income taxes and other taxes, fees and assessments relating to the performance of the Services. It is the Consultant's responsibility to be familiar with all applicable taxes and to comply with all laws, ordinances, regulations and other requirements related thereto. Consultant shall timely administer and pay all taxes and timely furnish to the appropriate taxing authorities all required information and reports in connection with such taxes. To the extent that Company is defined to be the final consumer with respect to any Contract (or portion thereof) under applicable state tax laws, Consultant shall state the portion of the Contract price that is attributable to the resulting taxes in a separate, itemized and easily identifiable manner on the Consultant invoice or application for payment. Consultant shall also provide to Company such additional information reasonably requested by Company to confirm that the correct amount of such sales and use taxes, and other applicable taxes, will be paid in connection with the Contract.

#### **ARTICLE 7. TRAVEL AND OTHER EXPENSES**

If required for the performance of the Services, and to the extent travel expenses are not otherwise included in the consideration to be paid Consultant pursuant to the Contract Documents, Company pre-approved expenses for travel and other expenses, including but not limited to Subcontractor expenses incurred by Consultant shall be reimbursed at Consultant's cost, without mark-up or any other surcharge, to the extent that such expenses are supported by original receipts or invoices. Such expenses will be invoiced as separate line items on any applicable invoice and shall include detailed supporting receipts that validate and support such expenses.

**ARTICLE 8. ACCOUNTING AND AUDITING**

Consultant shall keep accurate, detailed and complete accounting records as may be necessary for substantiation of the Contract requirements, and all charges incurred or billed. The method for maintaining documentation shall be satisfactory to Company and in accordance with generally accepted accounting principles. Except as provided below, Company, or its audit representatives, shall have the right at any reasonable time or times to examine, audit, and copy the records, vouchers, and other source documents which relate to any claim for compensation. Such documents shall be available for examination, audit and reproduction for three (3) years after the completion or termination of the applicable Contract. The provisions of this Article do not apply to the substantiation of the pricing set forth in a fixed-price Contract; however, they do apply to termination charges, change orders, escalation, claims, amendments or other charges under any such Contracts that are determined on a basis other than fixed price.

Consultant shall assist Company with preparing necessary audit material and will allow Company to review any work papers prepared by independent auditors as allowed by professional standards.

Audit findings by Company's representative will be considered to be final and conclusive for the period audited. Any over collections shall be returned to Company within thirty (30) days from date of Notice of overcharge.

**ARTICLE 9. CREDIT REQUIREMENTS**

Consultant shall meet the requirements of either clause (i) or clause (ii) below: (i) Consultant maintains a senior unsecured debt rating from Standard & Poor's of BBB- or better; or (ii) if Consultant does not maintain a satisfactory debt rating, Consultant meets ALL of the following credit standards: a) tangible net worth ten (10) times the projected maximum liability of Consultant under the applicable Contract; b) no change in the condition of its earnings, net worth, or working capital over the last twenty-four (24) months, which would reasonably be anticipated to impair Consultant's ability to meet its obligations under the applicable Contract; and c) Consultant is not in default under any of its other agreements and is current on all of its financial obligations.

If requested by Company, Consultant shall within thirty (30) days provide Company with copies of its most recent annual and quarterly financial statements prepared in accordance with generally accepted accounting principles.

**ARTICLE 10. SECURITY**

In the event Consultant is unable to satisfy the credit requirements set forth in ARTICLE 9, CREDIT REQUIREMENTS at any time during the performance of the Services, or if Consultant experiences a Material Adverse Change at any time during such performance, then Consultant shall provide Company with security against defaults by Consultant under the Contract in such form and amount as may be reasonably required by Company ("Performance Security"), and pursuant to such additional agreements or instruments as may be reasonably required by Company, including but not limited to letters of credit, parent or third-party guaranties, escrow accounts, or other forms of security satisfactory to Company. Company may at any time, at its own discretion or pursuant to a request by Consultant, recalculate the amount of Performance Security required pursuant to this Article, in which case Company shall increase or decrease the existing amount of Performance Security, as appropriate. At no time shall the amount of Performance Security to which Company is entitled pursuant to this Article be less than Company's Net Replacement Costs. In addition, notwithstanding Consultant's ability to satisfy ARTICLE 9, CREDIT REQUIREMENTS, Company may require a specific form and amount of Performance Security with respect to any Contract and the pricing for such Performance Security shall be included within the pricing specified in the Contract Documents.

The terms of any letter of credit required by Company shall conform to the attached Exhibit C, as well as the requirements of the Contract and shall be issued by a bank acceptable to Company. The letter of credit shall provide for payment to Company of the letter of credit stated amount if Consultant defaults under the terms of the Contract. Company shall have the right to call the entire amount of the letter of credit if Consultant has not renewed the letter of credit thirty (30) days prior to its expiration.

Consultant's expenses of complying with additional Performance Security obligations as set forth in this Article shall be borne by Consultant.

**ARTICLE 11. WITHHOLDING PAYMENT**

Company may, without limiting any other rights or remedies Company may have, withhold from payment amounts which reflect the reasonable cost to repair or replace non-conforming or defective Services or the value of any claim which Company has against Consultant under the Contract. Company may also retain from payment sufficient funds to discharge any delinquent accounts of Consultant for which liens on Company's property have been or may be filed, and Company may at any time pay therefrom for Consultant's account such amounts as are, in the reasonable opinion of Company, due thereon, including

any sums due under any federal or state law.

**ARTICLE 12. DESIGNATED REPRESENTATIVES AND NOTICES**

Prior to commencement of the Services, each Party shall designate a representative authorized to act on its behalf, shall advise the other Party in writing of the name, address, and telephone number of such designated representative, and shall inform the other Party of any subsequent change in such designation. All communications to Company and Consultant relating to the Contract shall be communicated through such designated representatives.

Any Notice required to be delivered under the terms of this Master Contract shall be delivered to the representative of the other Party as designated below. In addition to providing Notice to Berkshire Hathaway Energy, Consultant shall provide the participating Affiliate about which the Notice pertains, a copy of the same addressed to the representative as set forth on Exhibit E. Additional Affiliates, which may elect to participate in and under this Master Contract after the effective date hereof, shall notify Consultant of the proper representative and address for forwarding Notices required hereunder. All Notices shall either be: (i) hand delivered; (ii) deposited in the mail, properly stamped with the required postage; (iii) sent via registered or certified mail; or (iv) sent via recognized overnight courier service. The Parties’ addresses for purposes of Notice shall be as set forth below and for Affiliates, as listed on Exhibit E:

<p><u>If to Company:</u></p> <p><u>Berkshire Hathaway Energy Company</u></p> <p><u>825 NE Multnomah, Suite 400</u></p> <p><u>Portland, Oregon 97232</u></p> <p><u>Attn: Contracts Manager</u></p> <p><u>Telephone: 503-813-5605</u></p>	<p><u>If to Consultant:</u></p> <p><u>Metalogic Inspection Services LLC</u></p> <p><u>1148 South Clarkston Street</u></p> <p><u>Denver, Colorado 80210</u></p> <p><u>Attn: Ryan Brashier</u></p> <p><u>Telephone: 720-660-1211</u></p>
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Either Party may change the name or address of the designated recipient of Notices by delivery of a Notice of such change as provided for in this Article.

**ARTICLE 13. EXAMINATION OF WORK AND PROGRESS REPORTS**

Consultant shall submit periodic progress reports as requested by Company. Company, its agents or representatives may visit Consultant’s office at any reasonable time to determine the status of ongoing Services required by the Contract Documents.

All Deliverables in progress will be subject to examination at any reasonable time or times by Company, which shall have the right to reject unsatisfactory Services. Neither examination of any Deliverables nor the lack of same nor acceptance of the Services by Company nor payment therefor shall relieve Consultant from any of its obligations under the Contract Documents.

**ARTICLE 14. PROFESSIONAL RESPONSIBILITY**

Consultant shall perform the Services in accordance with the Contract Documents and using the standards of care, skill, and diligence normally provided by a professional in the performance of similar Services on behalf of customers in the same industry or business as Company, and shall comply with all laws, codes and standards applicable to the Services.

In the event of Consultant’s failure to do so, Consultant shall, upon Notice by Company, promptly reperform the Services and correct the defect at Consultant’s sole cost. Consultant’s obligation to correct and reperform its Services shall be in addition to, and not in lieu of, any other right that Company may have.

**ARTICLE 15. CHANGES TO THE CONTRACT**

Company may at any time in writing direct changes and/or additions within the general scope of the Contract, direct the omission of or variation in Services, or alter the schedule. If any such direction results in a material change in the amount or character of the Services, an equitable adjustment in the price and/or other such provisions of the Contract Documents as may be affected shall be made and the Contract and/or any relevant Contract Documents shall be modified in writing accordingly. Any claim by Consultant for an adjustment under this Article shall be processed in accordance with the provisions of ARTICLE 30, CLAIM NOTICE AND RESOLUTION PROCEDURE.

No change shall be binding upon Company until a change order is executed by an authorized representative of Company which expressly states that it constitutes a change order to the Contract. THE ISSUANCE OF INFORMATION, ADVICE, APPROVALS, OR INSTRUCTIONS BY ANYONE OTHER THAN THE AUTHORIZED COMPANY REPRESENTATIVE SHALL NOT CONSTITUTE AN AUTHORIZED CHANGE ORDER PURSUANT TO THIS ARTICLE.

Any changes in Services shall apply only to the specific Contract pursuant to which the Services are being performed. No changes to the terms of this Master Contract shall be binding on Berkshire Hathaway Energy or any other Affiliate unless agreed to in writing by an authorized representative of Berkshire Hathaway Energy, which writing expressly states that it is an amendment to this Master Contract.

#### **ARTICLE 16. INSURANCE**

Without limiting any liabilities or any other obligations of Consultant, Consultant shall, prior to commencing Services, secure at its own expense and continuously maintain with insurance companies in good standing, acceptable to Berkshire Hathaway Energy and having an A.M. Best Insurance Reports rating of A-:VII or better such insurance as will protect Consultant from liability and claims for injuries and damages which may arise out of or result from Consultant's performance and operations under the Contract and for which Consultant may be legally liable, whether such performance and operations are by Consultant or a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. Consultant shall insure the risks associated with the Services and the Contract with minimum coverage and limits as set forth below:

Workers' Compensation. Consultant shall comply with all applicable workers' compensation laws and shall furnish proof thereof satisfactory to Company prior to commencing Services. If Services are to be performed in Washington or Wyoming, Consultant will participate in the appropriate state fund(s) to cover all eligible employees and provide a stop gap (employer's liability) endorsement. Coverage should also provide applicable federal regulations (including, without limitation, FELA, USL&H and the Jones Act).

Employers' Liability. Consultant shall maintain employers' liability insurance with a minimum single limit of \$500,000 each accident, \$500,000 disease each employee, and \$500,000 disease policy limit.

Commercial General Liability. Consultant shall maintain commercial general liability insurance on the most recently approved ISO policy form, or its equivalent, written on an occurrence basis, with limits not less than \$1,000,000 per occurrence/\$2,000,000 general aggregate (on a per location and/or per job basis) and shall include the following coverage:

- a. Premises and operations coverage
- b. Independent contractor's coverage
- c. Contractual liability
- d. Products and completed operations coverage
- e. Broad form property damage liability
- f. Personal and advertising injury liability, with the contractual exclusion removed
- g. Sudden and accidental pollution liability, as applicable

Business Automobile Liability. Consultant shall maintain business automobile liability insurance on the most recently approved ISO policy form, or its equivalent, with a minimum single limit of \$1,000,000 each accident for bodily injury and property damage including sudden and accidental pollution liability, with respect to Consultant's vehicles whether owned, hired or non-owned, assigned to or used in the performance of the Services.

Professional Liability. Consultant shall maintain professional liability insurance covering damages arising out of negligent acts, errors, or omissions committed by Consultant in the performance of this Contract, with a liability limit of not less than \$1,000,000 each claim. Consultant shall maintain this policy for a minimum of two (2) years after completion of the Services or shall arrange for a two (2) year extended discovery (tail) provision if the policy is not renewed. The intent of this policy is to provide coverage for claims arising out of the performance of Services under the Master Contract and caused by any error, omission for which the Consultant is held liable.

Umbrella or Excess Liability. Consultant shall maintain umbrella or excess liability insurance with a minimum limit of \$5,000,000 each occurrence/aggregate where applicable on a following form basis to be excess of the insurance coverage and limits required in employers' liability insurance, commercial general liability insurance and business automobile liability insurance above. Consultant shall provide Notice to Company, if at any time the full umbrella limit required under the Contract is not available, and will purchase additional limits, if requested by Company.

Berkshire Hathaway Energy and its Affiliates do not represent that the insurance coverage specified herein (whether in scope of coverage or amounts of coverage) are adequate to protect the obligations of Consultant, and Consultant shall be solely responsible for any deficiencies thereof.

Except for workers' compensation and professional liability insurance, the policies required herein shall include provisions or endorsements naming Berkshire Hathaway Energy, its Affiliates, divisions, subsidiary companies, co-lessees, co-venturers, joint owners and the officers, directors, agents, employees, servants and insurers of the same as additional insureds. In the event additional Affiliates elect to participate in and under this Master Contract after the effective date hereof, Consultant shall provide Berkshire Hathaway Energy and all its participating Affiliates updated certificates of insurance evidencing that it has included such newly participating Affiliates as additional insureds in each of the Consultant's insurance policies. The additional insured endorsement shall be ISO Form CG 20 10 and ISO Form CG 20 37, or their equivalents.

To the extent of Consultant's negligent acts or omissions, all policies required by the Contract shall include: (i) provisions that such insurance is primary insurance with respect to the interests of Berkshire Hathaway Energy and its Affiliates and that any other insurance maintained by Berkshire Hathaway Energy and its Affiliates is excess and not contributory insurance with the insurance required hereunder; and (ii) provisions that the policy contain a cross liability or severability of interest clause or endorsement in the commercial general liability and automobile liability coverage. Consultant shall provide Notice to Berkshire Hathaway Energy and all its participating Affiliates immediately upon receipt of notice of any policy cancellation or reduction of policy limits for any reason and shall provide proof of full replacement coverage prior to the effective date of cancellation. Unless prohibited by applicable law, all required insurance policies (except professional liability) shall contain provisions that the insurer will have no right of recovery or subrogation against Berkshire Hathaway Energy, its parent, divisions, Affiliates, subsidiary companies, co-lessees, or co-venturers, joint owners, agents, directors, officers, employees, servants, and insurers, it being the intention of the Parties that the insurance as effected shall protect all of the above-referenced entities.

A certificate of insurance shall be furnished to Berkshire Hathaway Energy and all participating Affiliates confirming the issuance of such insurance prior to commencement of any Services by Consultant. Should a loss arise during the Term of the Contract that may give rise to a claim against Consultant and/or Berkshire Hathaway Energy or its Affiliates as additional insureds, Consultant shall deliver to Berkshire Hathaway Energy and its participating Affiliates (or cause to be delivered to Company) certified copies of such insurance policies.

Consultant shall require Subcontractors who perform Services at the Work Site to carry liability insurance (auto, commercial general liability and excess) and workers' compensation/employer's liability insurance commensurate with their respective scopes of work. Consultant shall remain responsible for any claims, lawsuits, losses and expenses (including defense costs) that exceed any of its Subcontractors' insurance limits and for uninsured claims or losses.

#### **ARTICLE 17. INDEMNIFICATION**

Consultant specifically and expressly agrees to indemnify, defend, and hold harmless Company, Berkshire Hathaway Energy, and all its Affiliates, and their respective officers, directors, employees, joint owners and agents (hereinafter collectively "Indemnitees") against and from any and all claims, demands, suits, losses, costs and damages of every kind and description, including attorneys' fees and/or litigation expenses, brought or made against or incurred by any of the Indemnitees resulting from or arising out of the acts, errors or omissions of Consultant, its employees, agents, representatives or Personnel of any tier, their employees, agents or representatives in the performance or nonperformance of Consultant's obligations under the Contract or in any way related to the Contract. The indemnity obligations under this Article shall include without limitation:

- a. Loss of or damage to any property of Company, Consultant or any third party;
- b. Bodily injury to, or death of any person(s), including without limitation employees of Company, or of Consultant or its Personnel of any tier; and
- c. Claims arising out of or related to workers' compensation, unemployment compensation, or similar such laws or obligations applicable to employees of Consultant or its Personnel of any tier.

If any claim, legal action or suit arising from the Services is instituted by any person or entity against an Indemnitee as a result of an action for which Consultant has agreed to indemnify Company under this Article, then Consultant will assume the defense of that claim, legal action or suit, upon being notified to do so by Company and will pay any judgment or settlement rendered in such action or suit. It is understood and agreed by Consultant that if an Indemnitee is named a defendant in any such claim, legal action or suit and Consultant fails or neglects to assume the defense thereof after having been notified to do so, Company may compromise and settle or defend the claim, legal action or suit and Consultant is bound to reimburse Company for the amount expended by Company in paying any judgment or settlement, together with all reasonable attorneys' fees and court costs, incurred by Company by reason

of its defense or settlement of such legal action or suit. Any judgment or amount expended by Company in compromising or settling such legal action or suit shall be conclusive as determining the amount for which Consultant is liable to reimburse Company.

Consultant's indemnity obligations under this Article shall not extend to any liability caused by the negligence of any of the Indemnitees. In claims, legal actions or suits against any of the Indemnitees by or on behalf of an employee, agent or representative of Consultant or an employee, agent or representative of any Subcontractor, Consultant's indemnification obligations under this Article shall not be limited by a limitation on amount or types of damages, compensation or benefits payable by Consultant or a Subcontractor under workers' compensation acts, disability acts or other employee benefit acts. Without limiting the foregoing, and to the extent applicable, Consultant specifically and expressly waives any immunity under Industrial Insurance, Title 51, RCW, and Workers' Compensation Law, Chapter 656, ORS, and acknowledges that this waiver was mutually negotiated by the Parties herein.

Consultant's indemnity obligations owing to Indemnitees under this Article are not limited by any applicable insurance coverage identified in ARTICLE 16, INSURANCE.

The invalidity, in whole or in part, of any of the foregoing paragraphs will not affect the remainder of such paragraph or any other paragraphs in this Article.

#### **ARTICLE 18. CHANGES IN PERSONNEL**

Prior to: (i) changing or replacing any "key" Personnel, as identified in the Scope of Work; or (ii) changing any classification, grade or rate of any Personnel performing Services under the Contract, Consultant shall provide Notice to Company of the proposed replacement/change before executing such replacement/change, and obtain Company's prior written approval for such replacement/change. Any replacement Personnel shall have the experience and capabilities equivalent to or better than the person replaced. If Consultant replaces or changes the classification, grade or rate of any person for performance of the Services described in the Contract Documents, without the express approval of the Company, then Consultant shall bear all costs associated with any and all such replacements and changes, and said costs shall not be reimbursable by Company.

#### **ARTICLE 19. CONSULTANT'S PERSONNEL; DRUGS, ALCOHOL AND FIREARMS**

Consultant shall employ in the performance of the Services only persons qualified for the same. Consultant shall at all times enforce strict discipline and good order among its employees and all Personnel of any tier. Consultant shall not permit or allow the introduction or use of any firearms, illegal drugs or intoxicating liquor upon the Work Site under the Contract, or upon any of the grounds occupied, controlled, or used by Consultant in the performance of the Services. Consultant shall immediately remove from the performance of Services, whenever requested by Company, any person considered by Company to be incompetent, insubordinate, careless, disorderly, in violation of the above restriction on firearms, illegal drugs or intoxicating liquor, or under the influence of illegal drugs or intoxicating liquor, and such person shall not again be employed in the performance of the Services herein without the prior written consent of Company.

#### **ARTICLE 20. FOREIGN CORPORATIONS**

If Consultant is a corporation organized under laws of a state other than those of the applicable Work Site, Consultant shall furnish Company with a certified copy of its permit to transact business in such state prior to commencing Services under the Contract.

#### **ARTICLE 21. SUBSTANCE ABUSE; DRUG AND ALCOHOL POLICY**

Consultant shall have in place and ensure compliance with a substance abuse/drug and alcohol policy that complies with all applicable federal, state and/or local statutes and regulations. Consultant represents and warrants that Consultant and all Personnel engaged in performing Services hereunder are in compliance with Consultant's substance abuse/drug and alcohol policy. During the term of the Contract, Consultant shall keep accurate and detailed documentation of its drug policy and all Personnel drug tests, which it shall submit to Company upon request. Consultant shall designate one person to be responsible for compliance with the requirements of this Article and all reporting and inquiries shall be made to a duly authorized representative of Company in a timely manner.

#### **ARTICLE 22. DEPARTMENT OF TRANSPORTATION**

Consultant shall ensure Department of Transportation compliance, including but not limited to valid driver's license, equipment inspections, hours of service and all appropriate documentation for any Personnel who may drive while performing Services under the Contract.

**ARTICLE 23. BUSINESS ETHICS**

Consultant, its employees, officers, agents, representatives and Subcontractors shall at all times maintain the highest ethical standards and avoid conflicts of interest in the performance of Consultant's obligations under the Contract. In conjunction with its performance of the Services, Consultant and its employees, officers, agents and representatives shall comply with, and cause its Subcontractors and their respective employees, officers, agents and representatives to comply with, all applicable laws, statutes, regulations and other requirements prohibiting bribery, corruption, kick-backs or similar unethical practices including, without limitation, the United States Foreign Corrupt Practices Act, the United Kingdom Bribery Act 2010, and the Company Code of Business Conduct. Without limiting the generality of the foregoing, Consultant specifically represents and warrants that neither Consultant nor any Subcontractor employees, officers, representatives or other agents of Consultant have made or will make any payment, or have given or will give anything of value, in either case to any government official (including any officer or employee of any governmental authority) to influence his, her, or its decision or to gain any other advantage for Company or Consultant in connection with the Services to be performed hereunder. Consultant shall maintain and cause to be maintained effective accounting procedures and internal controls necessary to record all expenditures in connection with the Contract and to verify Consultant's compliance with this Article. Company shall be permitted to audit such records as reasonably necessary to confirm Consultant's compliance with this Article. Consultant shall immediately provide Notice to Company of any facts, circumstances or allegations that constitute or might constitute a breach of this Article and shall cooperate with Company's subsequent investigation of such matters. Consultant shall indemnify, defend and hold Company harmless from all fines, penalties, expenses or other losses sustained by Company as a result of Consultant's breach of this Article. The Parties specifically acknowledge that Consultant's failure to comply with the requirements of this Article shall constitute a condition of default under the Contract.

**ARTICLE 24. REVIEW OF DELIVERABLES**

Review by Company of any Deliverables submitted by Consultant shall not relieve Consultant of its responsibility to comply with all requirements of the Contract Documents. Notwithstanding any such review by Company, Consultant shall remain responsible for the accuracy of the Deliverables and for ensuring that any other materials fabricated from such Deliverables conform to the Contract Documents.

**ARTICLE 25. SAFETY AND SITE REGULATIONS; PROTECTION OF PRE-EXISTING FACILITIES; CLEANUP**

Consultant shall be solely responsible for being aware of and initiating, maintaining and supervising compliance with all safety laws, regulations, precautions, and programs in connection with the performance of the Contract. Consultant shall also make itself aware of and adhere to all applicable Company Work Site regulations including, without limitation, environmental protection, loss control, dust control, safety, and security.

Consultant and its Personnel of any tier shall maintain accurate and current safety records consistent with industry practice during the performance of Services under the Contract. Further, Consultant and its Personnel of any tier shall immediately, and in no event more than twenty-four (24) hours, provide Notice to Company of all cases of death or injury to Consultant or Personnel or any other third parties during or related to the performance of Services under the Contract. Consultant shall provide Notice to the Company, which notification shall include, but is not limited to, notice of all vehicle accidents, electrical contacts, electrical flashes, and OSHA recordable incidents. Within forty-eight (48) hours of any safety incident reported to Company, Consultant shall provide Company with a preliminary accident investigation report detailing the facts of the incident, any known root cause, and action steps being taken by Consultant to further investigate the incident and mitigate future occurrences.

Consultant shall immediately notify, and in no event more than twenty-four (24) hours, Company and provide a copy of any safety citation issued by any governmental authority.

Consultant shall protect existing equipment and facilities, and avoid interference with Company's operations.

Consultant shall not remove or alter any part of the existing structures, equipment or facilities without the prior knowledge and consent of Company.

Consultant shall keep the Work Site, including storage areas used by it, free from accumulation of waste materials or rubbish arising out of the Services, and prior to completion of the Services, shall remove and properly dispose of any such rubbish from and about the Work Site, as well as remove all tools and equipment not property of Company. Upon completion of the Services, Consultant shall leave the Work Site in a condition satisfactory to Company. In the event of Consultant's failure within a reasonable time to comply with any of the foregoing, Company may, after written Notice to Consultant of such failure, perform the cleanup and removal at the expense of Consultant.

**ARTICLE 26. PROGRESS MEETINGS**

Company will conduct weekly, or at other regular intervals as agreed by both Parties, meetings with Consultant, and Consultant shall participate in the same, to discuss the performance of the Services.

**ARTICLE 27. COOPERATION WITH OTHERS**

Consultant shall fully cooperate and coordinate with Company employees and other contractors who may be awarded other work. Consultant shall not commit or permit any act which will interfere with the performance of work by Company employees or other contractors.

**ARTICLE 28. LIENS**

Consultant shall: (i) indemnify, defend, and hold harmless Company from all laborers,' materialmen's and mechanics' liens or other claims made or filed against Company or upon the Work Site or other Company property on account of any Services performed or Deliverables furnished by Subcontractors of any tier in connection with the Services; and (ii) keep the Work Site and said property free and clear of all liens or claims arising from the performance of any Services covered by the Contract by Consultant or its Subcontractors of any tier.

If any lien arising out of the Contract is filed before or after Services is completed, Consultant, within ten (10) days after receiving from Company Notice of such lien, shall obtain release of or otherwise satisfy such lien. If Consultant fails to do so within such period of time, Company may take such steps and make such expenditures as in its discretion it deems advisable to obtain release of or otherwise satisfy any such lien or liens, and Consultant shall upon demand reimburse Company for all costs incurred and expenditures made by Company in obtaining such release or satisfaction. If any non-payment claim is made directly against Company arising out of non-payment to any Subcontractor (including any liens or claims based on the failure or alleged failure to maintain a payment bond), Consultant shall assume the defense of such claim within ten (10) days after receiving Notice of such claim from Company. If Consultant fails to do so, Consultant shall upon demand reimburse Company for all costs incurred and expenditures made by Company to satisfy such claim.

Consultant's obligation to indemnify, defend and hold harmless Company from liens and claims shall not in any way be rendered unenforceable, or altered, amended, eliminated or otherwise conditioned by any laws and regulations related to processing such liens. Company shall have no obligation to deliver a copy of any notice of claim or right to a lien to Consultant or any other person or entity.

**ARTICLE 29. CONFLICTS, ERRORS, OMISSIONS, OR DISCREPANCIES IN CONTRACT DOCUMENTS**

Consultant shall advise Company in writing of all conflicts, errors, omissions, or discrepancies among the various Contract Documents immediately upon discovery and prior to Consultant's performing the affected Services. If Consultant performs any Services knowing it involves a recognized error, inconsistency or omission in the Contract Documents without such notice to Company, Consultant shall be responsible for all necessary corrective work and shall bear all costs for correction. Anything mentioned in the Scope of Work and not shown on the drawings, or shown on the drawings and not mentioned in the Scope of Work, shall be considered as if shown or mentioned in both.

**ARTICLE 30. CLAIM NOTICE AND RESOLUTION PROCEDURE**

In the event Consultant has a claim or request for a time extension, additional compensation, any other adjustment of the Contract terms, or any dispute arising under the Contract (hereinafter "Claim"), Consultant shall provide Company with Notice of such Claim within five (5) business days following the occurrence of the event giving rise to the Claim. Consultant's failure to give Notice as required will constitute a waiver of all of Consultant's rights with respect to the Claim.

As soon as practicable after Claim notification, Consultant shall submit the Claim to Company with all supporting information and documentation. Consultant shall also respond promptly to all Company inquiries about the Claim and its basis.

Any Claim that is not disposed of by mutual agreement between the Parties shall be decided by Company, which shall provide a written decision to Consultant. Such decision shall be final unless Consultant, within thirty (30) days after such receipt of Company's decision, provides to Company a written protest, stating clearly and in detail the basis thereof. Consultant's failure to protest Company's decision within that time period shall constitute a waiver by Consultant of its right to dispute the decision. Even if a Claim arises, Consultant shall continue its performance of the Services under the terms of the Contract.



**ARTICLE 31. SUSPENSION OF WORK**

Company may, by Notice, direct Consultant to suspend performance of any or all of the Services under the Contract for a specified period of time. Upon receipt of such Notice to suspend the Services, Consultant shall: (i) discontinue Services; (ii) place no further orders or subcontracts; (iii) suspend all orders and subcontracts; (iv) protect and maintain the Deliverables; and (v) otherwise mitigate Company's costs and liabilities for those portions of the Services so suspended. Company shall pay Consultant an equitable amount for incremental costs incurred by Consultant as a result of the suspension; provided, however, that if the suspension is due to Consultant's failure to comply with the Contract, no such payment shall be made. Upon any reinstatement of the Services by Company, the time for completion of the Services will be extended for a period equal to the time lost by reason of the suspension.

**ARTICLE 32. TERMINATION FOR CONVENIENCE**

Company may terminate the Contract in whole or in part at any time without cause prior to its completion by sending to Consultant Notice of such termination. Upon such termination, Company shall pay to Consultant, in full satisfaction and discharge of all liabilities and obligations owed Consultant, for all Services satisfactorily performed by Consultant as of the date of termination. Company shall not be liable to Consultant or any of its Subcontractors for anticipated profits or overhead based upon Services not yet performed as of the date of termination.

**ARTICLE 33. TERMINATION FOR CAUSE**

1. For purposes of the Contract, a default by Consultant shall be the occurrence of any of the following:
  - a. A breach by Consultant of any of its material obligations under the Contract, if such breach continues uncured for a period of seven (7) days after receipt of Notice from Company, unless Company agrees, in writing, to grant Consultant an extension of such seven (7) day period for a period of time to be determined at Company's sole discretion. In such circumstance, Company shall prescribe the new cure period in writing. For purposes of the Contract, a default by Consultant shall be deemed to include, without limitation, Consultant's refusal or neglect to supply sufficient and properly skilled Personnel, materials or Deliverables of the proper quality or quantity, or equipment necessary to perform the Services described in the Contract properly, or Consultant's failure in any respect to prosecute the Services described in the Contract or any part thereof with promptness, diligence and in accordance with all of the material provisions hereof;
  - b. Consultant fails in any material respect to comply with any laws, ordinances or regulations pertaining to safety or environmental compliance;
  - c. A determination that any representation, statement or warranty made by Consultant in the Contract Documents or any other statement, report or document which Consultant is required to furnish to Company, was false or misleading in any material respect;
  - d. The occurrence of any of the following: (i) the filing by or against Consultant of a proceeding under any bankruptcy or similar law, unless such proceeding is dismissed within thirty (30) days from the date of filing; (ii) the making by Consultant of any assignment for the benefit of creditors; (iii) the filing by or against Consultant for a proceeding for dissolution or liquidation, unless such proceeding is dismissed within thirty (30) days from the date of filing; (iv) the appointment of or the application for the appointment of a receiver, trustee or custodian for any material part of Consultant's assets unless such appointment is revoked or dismissed within thirty (30) days from the date thereof; (v) the attempt by Consultant to make any adjustment, settlement or extension of its debts with its creditors generally; (vi) the insolvency of Consultant; or (vii) the filing or recording of a notice of lien or the issuance or the obtaining of a levy of execution upon or against a material portion of Consultant's assets, unless such lien or levy of execution is dissolved within thirty (30) days from the date thereof; or
  - e. A Material Adverse Change has occurred with respect to Consultant and Consultant fails to provide such performance assurances as are reasonably requested by Company, including without limitation the posting and maintaining of Performance Security pursuant to ARTICLE 10, SECURITY.
2. Upon the occurrence of any such default, following the applicable process described in this Article, Company shall be entitled, upon Notice to Consultant, without any further waiting period and without Notice to Consultant's sureties, and without limiting any of Company's other rights or remedies, to terminate the Contract or to terminate Consultant's right to proceed with that portion of the Services affected by any such default and collect the Net Replacement Costs incurred to complete the Services.

3. Upon the occurrence of any such default, Company shall be entitled to seek performance by any guarantor of Consultant's obligations hereunder or draw upon any Performance Security provided for in the Contract.
4. Upon the occurrence of any such default, Company shall be entitled to pursue any and all other rights and remedies that it may have against Consultant under the Contract or at law or in equity.
5. In the event of such termination, Company may, for the purpose of completing the Services or enforcing these provisions, take possession of all completed and in-process Deliverables and may use them or may finish the Services by whatever method it may deem expedient including: (i) Company may hire a replacement consultant(s) to complete the remaining Services that Consultant was otherwise obligated to complete under the Contract using such form of agreement as Company may deem advisable; or (ii) Company may itself provide any labor, materials, equipment, Deliverables and services necessary to complete the Services.
6. All rights and remedies provided in this Article are cumulative, and are not exclusive of any other rights or remedies that may be available, whether provided by law, equity, statute, in any other agreement between the Parties or otherwise. Upon the occurrence of any such default, following the applicable process described in this Article, Company shall be entitled to pursue any and all other rights and remedies, including without limitation damages, that Company may have against Consultant under the Contract or at law or in equity.

#### **ARTICLE 34. DELAYS**

**Force Majeure.** Neither Party shall be liable for delays caused by a Force Majeure Event; provided, however, that both Parties agree to seek to mitigate the potential impact of any such delay. Any delay attributable to a Force Majeure Event shall not be the basis for a request for additional compensation. In the event of any such delay, the required completion date may be extended for a reasonable period not exceeding the time actually lost by reason of the Force Majeure Event.

**Company-Caused Delay.** If Consultant is actually delayed in its performance of the Services by the actions or omissions of Company (excluding Company's good faith exercise of rights and remedies provided under the Contract), or by changes ordered with respect to the Services, and if Consultant is able to prove that it has used all reasonable means to avoid or minimize the effects of the delay, then, as Consultant's sole remedy, Consultant's guaranteed completion dates shall be equitably adjusted to reflect the impacts of such Company-caused delays. Company may, at its discretion, in lieu of granting an extension of time, require Consultant to regain the schedule whereby Company shall compensate Consultant for all additional costs reasonably incurred thereby. No adjustment under this Article shall be made for any delay to the extent that it is caused or contributed to by Consultant or performance would have otherwise been delayed by any other cause, including the fault or negligence of Consultant.

**Consultant-Caused Delay.** Any Services not performed or Deliverables that are not delivered in accordance with and within the time specified in the Contract Documents may constitute a default to the extent set forth in the terms and conditions of the Contract, and only to the extent that the delay is in no way related to either a Force Majeure Event or Company-caused delay.

**Request For Time Extension.** Any request for time extension or additional compensation shall be made in accordance with ARTICLE 30, CLAIM NOTICE AND RESOLUTION PROCEDURE.

#### **ARTICLE 35. COMPLIANCE WITH LAWS**

Consultant shall at all times comply with all laws, statutes, regulations, rules, executive orders, ordinances, codes, and standards applicable to Consultant's performance of the Work including, without limitation, those governing health and safety, wages, hours, employment of minors, desegregation and employment discrimination, as each may be applicable to the Work performed hereunder, and based on total anticipated dollar value of this Contract. Consultant further confirms that its employees and the employees of all Subcontractors employed under the Contract may legally work in the United States.

**Without limiting the generality of the foregoing, Consultant and any Subcontractors shall abide by the requirements of 41 CFR §§60-1.4(a), 60-300.5(a) and 60-741.5(a). These regulations prohibit discrimination against qualified individuals based on their status as protected veterans or individuals with disabilities, and prohibit discrimination against all individuals based on their race, color, religion, sex or national origin. Moreover, these regulations require that covered prime contractors and subcontractors take affirmative action to employ and advance in employment individuals without regard to race, color, religion, sex, national origin, protected veteran status or disability. Consultant and any Subcontractors shall also abide by the requirements of Executive Order 11246, as amended, to develop and maintain a written affirmative action program (AAP) and Executive Orders 11625 and 13170 (utilization of disadvantaged business enterprises) and the Small Business Act.**

Consultant shall indemnify, defend and hold harmless Berkshire Hathaway Energy, Company, its directors, officers, employees and agents from all losses, costs and damages by reason of any violation thereof and from any liability, including without limitation fines, penalties and other costs arising out of Consultant's failure to so comply.

**ARTICLE 36. FEDERAL SECURITY REGISTRY**

Consultant warrants that neither Consultant nor any of its Personnel are on the United States federal government's list of suspected terrorists or suspected terrorist organizations.

**ARTICLE 37. INDEPENDENT CONTRACTOR**

Consultant shall perform the Services as an independent contractor, at its sole risk, and shall be solely responsible for the direction and control of all Personnel. Consultant is to determine the manner and method by which the Services shall be performed by it to conform to the Contract Documents. Company's general rights to inspect the Deliverables and enforce the Contract shall not make, or be construed to make, such Personnel the agents or employees of Company.

**ARTICLE 38. RELEASE OF INFORMATION – ADVERTISING AND PROMOTION**

Consultant shall not publish, release, disclose or announce to any member of the public, press, official body or any other third party any information concerning the Contract and/or the Services, or any part thereof, except as required by law. Neither the names of Company, nor the Work Site shall be used in any advertising or other promotional context by Consultant.

**ARTICLE 39. CONFIDENTIAL INFORMATION; NONDISCLOSURE**

**Definition of Confidential Information.** The term "Confidential Information" means: (i) proprietary information of Company; (ii) information marked or designated by Company as confidential; (iii) Critical Infrastructure Information and Protected Information of Company; (iv) information, whether or not in written form and whether or not designated as confidential, which is known to Consultant as being treated by Company as confidential; (v) information provided to Company by third parties which Company is obligated to keep confidential (including but not limited to Consultant's information relating to an identified or identifiable natural person, whether or not such information is publicly available); and (vi) information developed by Consultant in connection with the performance of the Contract.

**Nondisclosure.** Consultant agrees that it will not disclose Confidential Information, directly or indirectly, under any circumstances or by any means, to any third person without the express prior written consent of Company.

**Nonuse.** Consultant further agrees that it will not use Confidential Information except as may be necessary to perform the Services called for by the Contract.

**Protection.** Confidential Information will be made available by Consultant to its employees only on a "need to know" basis and only after notifying such employees of the confidential nature of the information and after having obligated them to the nonuse and nondisclosure obligations of the Contract. Consultant agrees to take all reasonable precautions to protect the confidentiality of Confidential Information and, upon request by Company, to return to Company any documents which contain or reflect such Confidential Information.

Unless waived in writing by Company, Consultant shall require all Personnel of any tier, to adhere to these confidential information and nondisclosure terms.

**ARTICLE 40. OWNERSHIP OF DESIGNS, DRAWINGS, AND WORK PRODUCT (OTHER THAN SOFTWARE)**

Except to the extent consisting of Consultant's Pre-Existing Property (as defined below), the Deliverables (excluding Software) prepared or developed hereunder, or other documents or information provided to Company, by Consultant or its employees or agents, or Subcontractors or their employees or agents, shall become the physical property of Company when prepared and, to the extent subject to protection under copyright laws, shall constitute "work made for hire" and shall become the intellectual property of Company, without regard to any markings that may denote a confidential or proprietary interest of Consultant in the said items. To the extent the Deliverables (excluding Software) incorporate pre-existing intellectual property of Consultant or of any third party ("Pre-Existing Property"), Consultant hereby grants Company a perpetual, fully paid, transferable right to use, copy and modify such Pre-Existing Property for the purpose of Company's operation, administration, maintenance, modification, improvement and replacement of the Company's assets the fullest extent necessary to accomplish those purposes. Such license includes the right of Company to share Pre-Existing Property with Company's contractors, agent, officers, directors, employees, joint owners, affiliates and consultants for the foregoing purpose, without regard to any markings that may denote a confidential or proprietary interest in the said items. Consultant hereby represents, warrants and covenants that it holds all requisite rights and third party consents necessary to grant the foregoing license without infringing

the rights of any third party.

Consultant shall deliver all Deliverables, together with any documents or information furnished to Consultant and its employees or agents by Company hereunder, upon Company's request and, in any event, upon termination or final acceptance of the Services.

#### **ARTICLE 41. CUSTOMIZED SOFTWARE AND LICENSED SOFTWARE**

Unless the Contract Documents provide otherwise, all Customized Software, if any, provided by Consultant to Company under a Contract shall be provided to Company in the form of source code on a "work for hire" basis and shall become the sole and exclusive intellectual property of Company when prepared by Consultant or its employees or agents, or Subcontractors or their employees or agents.

In the event Consultant provides Company with Licensed Software, and the Company and Consultant do not enter into a stand-alone software license agreement with regard to the same, the following provisions shall apply:

As between Company and Consultant, except with respect to the license granted with respect to the Licensed Software, all right, title and interest in and to the Licensed Software provided by Consultant to Company are owned and retained by Consultant.

Except to the extent that the Contract Documents provide otherwise, Consultant hereby grants Company a perpetual, fully paid, non-exclusive, irrevocable, transferrable license to install, load, use, copy, modify (in machine readable object code form) and transmit the Licensed Software as Company deems necessary for its internal business purposes; provided that the number of copies of the Licensed Software in use by Company shall not exceed the number of licenses purchased by Company pursuant to the applicable Contract Documents. Company may make the Licensed Software available to Company's employees, contractors, affiliates, subsidiaries, direct/indirect parents and successor organizations only as required to perform services for Company. Each perpetual license granted by Consultant to Company shall survive the expiration of this Master Contract and the completion of the Services, and the Parties respective rights and obligations with respect thereto shall remain subject to the applicable terms of the Contract Documents.

Consultant hereby warrants that the Software shall conform to the requirements of the Contract and the Contract Documents, shall execute and perform in accordance with applicable published documentation and marketing materials and shall be free from material defects for a period of one (1) year from (i) the "go live" date following installation and testing, if the Services include installation and testing of the Software, or (ii) the date of delivery if the Services do not include installation and testing of the Software, or such shorter period as may be agreed by the Parties in the applicable Contract Documents ("Software Warranty Period"). In addition, Consultant warrants that the Software when delivered: (i) shall be free from any charge, lien, security interest or other encumbrance; (ii) shall be free of any viruses or other harmful code including any "back door," "drop dead device," "time bomb," "Trojan horse," or "worm" (as such terms are commonly understood in the software industry) or any other code designed or intended to have, or capable of performing, any of the following functions: (x) disrupting, disabling, harming or otherwise impeding in any manner the operation of, or providing unauthorized access to, a computer system or network or other device on which such code is stored or installed; or (y) damaging or destroying any data or file without the user's consent; except that, with respect to the Licensed Software, (A) Consultant may insert a use limitation routine which shall be triggered in the event Company exceeds the number of users licensed by Company or an individual licensed user's attempts to access unlicensed elements of the Licensed Software, but which shall only affect the unlicensed users or licensed users' ability to access unlicensed elements of the Licensed Software and (B) Consultant may provide separate "keys" for each hardware device, provided that in the event Company desires to transfer the Licensed Software to a replacement device, Consultant shall issue a new "key" to Company upon request; and (iii) shall comply with the extended Daylight Saving Time schedule or the 2005 time schedule as applicable and will correctly process in any or both locations, within the United States, all information and data, and will not produce invalid or incorrect results because of legislated changes to Daylight Saving Time.

Following the expiration of the Software Warranty Period, Consultant shall have an obligation to correct defects and nonconformities with regard to the Licensed Software only to the extent that Company purchases support and maintenance services with respect thereto which, if purchased by Company, shall be provided on and subject to the terms and conditions of the applicable Contract Documents or other agreement as may be executed by Consultant and Company; provided that any software delivered by Consultant as part of such maintenance services shall be considered Licensed Software governed by the terms and conditions set forth herein.

Consultant further represents, warrants and covenants to Company that: (i) neither the delivery of the Customized Software to Company, if any, nor the granting of any license to Licensed Software hereunder infringes upon the intellectual property rights

of any third party; and (ii) Consultant shall not utilize, obtain or seek to obtain any rights, controls, compensation or remedies pertaining to the use of Company's data captured by or stored in the Licensed Software which at all times and in all situations Company shall own such data;

The Parties specifically agree the Licensed Software may be subject to additional provisions as may be agreed upon in the applicable Contract Documents, and that, to the extent Company and Consultant enter into a stand-alone software license agreement with respect to the Licensed Software, the terms of such agreement shall supersede the terms and conditions set forth in this Article with respect to the Licensed Software; provided that in no event shall any language or provisions contained on Consultant's website, product schedule or shrink-wrap or click wrap agreement be of any force and effect and such items shall not in any way constitute a Contract Document or otherwise supersede, modify or amend this Article or the terms and conditions set forth in any Contract Document, including any stand-alone software license agreement entered into by the Parties.

Promptly upon Company's request, Consultant shall provide all tools and information (including without limitation applicable passwords and authorization codes) necessary to ensure Company receives the full benefit of the Licensed Software purchased by Company pursuant to any Contract.

#### **ARTICLE 42. PATENT AND COPYRIGHT INDEMNITY**

Consultant shall indemnify, defend, and hold harmless Company, its directors, officers, employees, joint owners, and agents against and from all claims, losses, costs, suits, judgments, damages, and expenses, including attorneys' fees, of any kind or nature whatsoever on account of infringement of any patent, copyrighted or uncopyrighted work, including claims thereof pertaining to or arising from Consultant's performance under the Contract. If notified promptly in writing and given reasonable authority, information and assistance, and contingent upon Company not taking any position adverse to Consultant in connection with such claim, Consultant shall defend, or may settle at its expense, any suit or proceeding against Company so far as based on a claimed infringement which would result in a breach of this warranty, and Consultant shall pay all damages and costs awarded therein against Company due to such breach.

In case any Service or Deliverable, or any combination thereof, is in such suit held to constitute such an infringement and the use of said Service or Deliverable is enjoined, Consultant shall, at its expense and through mutual agreement between Company and Consultant, either procure for Company the right to continue using said Service or Deliverable, replace same with a non-infringing Service or Deliverable, or modify same so it becomes non-infringing.

#### **ARTICLE 43. ASSIGNMENT**

Consultant shall not assign the Contract or any part hereof, or any rights or responsibilities hereunder without the prior written consent of Company, and any attempted assignment in violation hereof shall be void.

#### **ARTICLE 44. SUBCONTRACTS**

If Consultant desires to subcontract any or all of the Services to another entity, such Subcontractor shall be subject to the prior written consent of Company. Consultant shall be fully liable and responsible for the acts or omissions of any Subcontractors of any tier and of all persons employed by them, shall maintain complete control over all such Subcontractors, and neither the consent by Company, nor anything contained herein, shall be deemed to create any contractual relation between a Subcontractor of any tier and Company.

#### **ARTICLE 45. NON-EXCLUSIVE RIGHTS**

Nothing in the Contract is to be construed as granting to Consultant an exclusive right to provide any or all of the Services anticipated herein. The use of Consultant's services is completely discretionary with Company. The Contract shall not be construed in any way to impose a duty upon Company to use Consultant.

#### **ARTICLE 46. NONWAIVER**

The failure of Company to insist upon or enforce strict performance by Consultant of any of the terms of the Contract, or to exercise any rights herein shall not be construed as a waiver or relinquishment to any extent of Company's right to enforce such terms or rights on any future occasion.

#### **ARTICLE 47. SEVERABILITY**

Any provision of the Contract prohibited or rendered unenforceable by operation of law shall be ineffective only to the extent of such prohibition or unenforceability and shall not invalidate the remaining provisions of the Contract.

**ARTICLE 48. APPLICABLE LAW AND VENUE**

In the event of any matter or dispute arising out of or related to a Contract, it is agreed between the Parties that such Contract shall be interpreted in accordance with the substantive and procedural laws (including statute of limitations provisions) of the jurisdiction of the principal business address of the applicable Company. With respect to Affiliates, this shall mean the principal business address of the Affiliate as identified in Exhibit E. The laws of such jurisdiction will govern the interpretation, validity and effect of this Contract without regard to the place of execution, place of performance thereof, or any conflicts of law provisions. Any litigation between the Parties arising out of or relating to the Contract will be conducted exclusively in appropriate courts of such jurisdiction, and Consultant consents to jurisdiction by such courts.

TO THE FULLEST EXTENT PERMITTED BY LAW, EACH OF THE PARTIES HERETO WAIVES ANY RIGHT IT MAY HAVE TO A TRIAL BY JURY IN RESPECT OF LITIGATION DIRECTLY OR INDIRECTLY ARISING OUT OF, UNDER OR IN CONNECTION WITH THE CONTRACT. EACH PARTY FURTHER WAIVES ANY RIGHT TO CONSOLIDATE ANY ACTION IN WHICH A JURY TRIAL CANNOT BE OR HAS NOT BEEN WAIVED.

WITH REGARD TO ANY CONTRACT GOVERNED BY CALIFORNIA LAW, THE FOLLOWING JURY TRIAL WAIVER AND ARBITRATION PROVISION APPLIES. TO THE FULLEST EXTENT PERMITTED BY LAW, EACH OF THE PARTIES HERETO WAIVES ANY RIGHT IT MAY HAVE TO A TRIAL BY JURY IN RESPECT OF LITIGATION DIRECTLY OR INDIRECTLY ARISING OUT OF, UNDER OR IN CONNECTION WITH THIS CONTRACT. EACH PARTY FURTHER WAIVES ANY RIGHT TO CONSOLIDATE ANY ACTION IN WHICH A JURY TRIAL CANNOT BE OR HAS NOT BEEN WAIVED. IF A WAIVER OF JURY TRIAL IS DEEMED BY ANY COURT OF COMPETENT JURISDICTION TO NOT BE ENFORCEABLE FOR ANY REASON, THEN TO THE FULLEST EXTENT PERMITTED BY LAW, EACH OF THE PARTIES HERETO AGREE TO BINDING ARBITRATION. SUCH ARBITRATION SHALL BE IN ACCORDANCE WITH THE RULES AND PROCEDURES OF THE AMERICAN ARBITRATION ASSOCIATION (AAA). NOTWITHSTANDING ANY AAA RULES AND PROCEDURES, OR ANY OTHER PROVISION OF ANY STATE OR FEDERAL LAWS, THE PARTIES AGREE THAT THE ARBITRATORS SHALL NOT CONSIDER OR AWARD PUNITIVE DAMAGES AS A REMEDY. UPON THE COMPANY'S REQUEST, AAA SHALL PROVIDE THE PARTIES A LIST OF ARBITRATORS EACH OF WHOM HAVE EXPERIENCE AND EXPERTISE WITH RESPECT TO CONSTRUCTION. UPON EACH OF THE PARTIES' RECEIPT OF SUCH LISTS, EACH PARTY SHALL HAVE TEN (10) DAYS TO SELECT AN ARBITRATOR. THE TWO SELECTED ARBITRATORS SHALL THEN SELECT A THIRD ARBITRATOR WITHIN THIRTY (30) DAYS FROM THE DATE THE INITIAL TWO ARBITRATORS WERE SELECTED AND THE MATTER SUBJECT TO ARBITRATION SHALL BE ARBITRATED AND A DECISION OF THE ARBITRATORS ISSUED WITHIN SIXTY (60) DAYS AFTER THE SELECTION OF THE THIRD ARBITRATOR.

**ARTICLE 49. ENTIRE CONTRACT; DOCUMENTS INCORPORATED BY REFERENCE**

The Contract, including all Contract Documents, shall in each case constitute the complete agreement between the Parties.

In the event of a conflict between (i) this Master Contract, and (ii) any other terms and conditions contained in any other Contract Documents, this Master Contract shall take precedence and control, unless the Parties have explicitly expressed a contrary intent in one of the other Contract Documents.

Company assumes no responsibility for any understanding or representation made by any of its employees, officers or agents during or prior to the negotiations and execution of a given Contract, unless such understanding or representation is expressly stated in the Contract.

**ARTICLE 50. EXECUTION AND EFFECTIVE DATE**

This Master Contract has been executed by duly authorized representatives of the Parties and shall be effective as of date of execution by the Company.

**CONSULTANT:**  
**Metalogic Inspection Services LLC**

**By:** \_\_\_\_\_  
(Signature)

**Name:** **Ryan Brashier**  
\_\_\_\_\_  
(Type or Print)

**Title:** **Regional Manager, US**  
**Operations**  
\_\_\_\_\_

\_\_\_\_\_  
(Date Executed)

**COMPANY:**  
**Berkshire Hathaway Energy Company**

**By:** \_\_\_\_\_  
(Signature)

**Name:** \_\_\_\_\_  
(Type or Print)

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

\_\_\_\_\_  
(Date Executed)

**Exhibit A**  
**Scope of Work Specification**

**For**

**Master: Examination of Boiler Components, High  
Energy Piping and General Plant Equipment**

Revision 1



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### Attachments

Attachment 1	Boiler Linear Phased Array (LPA) Scope
Attachment 4	General Non-Destructive Evaluation (NDE) Services Scope

## 1.0 Purpose

1.1 The purpose of this document is to provide general scopes of work for boiler evaluations and testing, boiler tube failure analysis and testing, high energy piping evaluations and testing, including general plant evaluations and testing services in accordance with the applicable criteria, specifications and standards.

1.1.1 Definitions of acronyms are found in Section 5.0 of this Specification.

1.1.2 This Specification is to be used in conjunction with the Applicable attachment as identified in the Table of Contents

## 1.2 Applicable Codes and Standards

As applicable the following codes and standards in effect on the date of the contract shall be the controlling codes and standards during the period of performance of the contract:

1.2.1 ASME/BPVC-Power Boilers and Pressure Vessels

1.2.2 ASME B31.1-Power Piping

1.2.3 NBIC- National Board Inspection Code

1.2.4 AWS – D1.1 and D1.3 Structural Steel

1.2.5 ASTM-American Society for Testing and Materials

1.2.6 ASNT-American Society for Nondestructive Testing

1.2.7 OSHA-Occupational Safety & Health Act

1.2.8 EPRI 1008082 Guidelines for Controlling FAC Fossil & CC Plants

1.2.9 MPC Publications HEP-1 through HEP-28

1.2 In general, boiler evaluations, boiler tube failure analysis as applicable, shall comply with the Electric Power Research Institute (EPRI) recommendations, and shall include but not limited to the following EPRI Publications:

1.2.7 Boiler Tube Failure: Theory and Practice

1.2.7.1 Volume 1: Boiler tube Fundamentals

1.2.7.2 Volume 2: Water-Touched Tubes

1.2.7.3 Volume 3: Steam-Touched Tubes

1.2.8 Boiler Tube Failure Metallurgical Guide:

1.2.8.1 Volume 1: Technical Report

1.2.8.2 Volume 2: Appendices

- 1.3 The Consultant or NDE service provider shall provide the Company plant and corporate representatives with information and recommendations for the application and possible utilization of new technology and processes and any cost savings methods and approaches.
- 1.4 A separate document, for each project shall be issued by Company. A project description will be provided by the Company for each individual Work Release. This project description will provide an overall description of the applicable project and a general outline of the services to be provided by Consultant or NDE services provider.
- 1.5 A detailed description of the Scope of Work will be provided in the individual Work Release for each project.
- 1.6 The Consultant or NDE service provider shall provide all labor, PPE, materials, and equipment (including supplemental lighting and extension cords) necessary to perform the examinations defined by this specification. Erection of scaffolding, removal of insulation, and general surface preparation will be provided by Company, unless otherwise noted in the individual Work Release.
  - 1.6.1 All Consultant's or NDE service provider's personnel shall comply with all applicable OSHA standards, and will be required to attend the Company Energy Safety training course prior to entering the Plant
  - 1.6.2 The Consultant or NDE service provider shall be responsible for obtaining the necessary calibration blocks. At least one week prior to the inspection,
  - 1.6.3 The Consultant or NDE service provider shall provide Company with a list of chemical products to be used in these inspections, the Material Safety Data Sheets for these products, and any special storage or disposal requirements.
  - 1.6.4 The Consultant or NDE service provider shall notify Company, at least one week prior to the inspections or evaluations, of any special auxiliary services (i.e., water, electrical or compressed air) which will be needed to perform specified inspections.
  - 1.6.5 The Consultant or NDE service provider is required to schedule with Company, their work activities including planned activity completion dates.
  - 1.6.6 If other NDE testing or work is being conducted by Company or others, concurrent with Consultant's inspection, Consultant or NDE service provider is expected to make reasonable accommodations for these concurrent inspections.

- 1.6.7 The Company may perform metallographic examinations based upon the Consultant's or NDE service provider findings; therefore, Consultant or NDE service provider is required to schedule their efforts to complete the examinations at each location prior to moving to other locations, unless approved by Company's site representative.
- 1.6.8 In addition to the inspections defined in the project "Scope of Work," Consultant or NDE service provider may be required, as additional scope, to provide additional inspections. When requested, Consultant shall provide unit costs for each inspection method.
- 1.6.9 Prior to completion of field examinations, Consultant NDE service provider shall provide Company's site representative with a field report as described in Section 3.1.
- 1.6.10 The Responsible Company Representative shall be identified by the respective Technical/Engineering Group for each participating Company subsidiary.

## **2.0 Technical Requirements**

- 2.1 NDE processes, method or technique effectiveness and proficiency shall be established by one of the following methods:
  - 2.1.1 Generally accepted methods, processes, techniques may be accepted by submitting documented techniques to the Company for review and approval in accordance with the applicable codes and Section V of the ASME BPVC.
  - 2.1.2 When new technology, processes, methods, or techniques are to be applied to Boiler tube inspections or to High Energy Piping (HEP) inspections for identification of early stage creep damage. These processes may be accepted by:
    - 2.1.2.1 Demonstrating proficiency by using the Company approved boiler tube FlawTech coupons
    - 2.1.2.2 Demonstrating proficiency using the EPRI boiler tube coupons and presenting documentation of results
    - 2.1.2.3 For HEP by demonstrating proficiency using the Materials Property Counsel (MPC) controlled set of coupons (University of Tennessee, Knoxville, TN)
    - 2.1.2.4 Alternatively new technology, processes, methods, or techniques may be presented to the responsible Company representative for approval.

- 2.2 NDE Technicians' effectiveness and proficiency shall be established by one of the following methods:
- 2.2.1 For generally accepted NDE methods, processes, or techniques; qualification and certification may be in accordance with the latest revision of the American Society of Non-destructive Testing Recommended Practices # SNT-TC-1A and must comply with ASME/NBIC code requirements.
  - 2.2.2 NDE Technicians' utilizing new technology, processes, methods, or techniques to be applied to Boiler tube and HEP inspections shall qualify by testing;
    - 2.2.2.1 Using the Company approved boiler tube FlawTech coupons.
    - 2.2.2.2 By demonstrating proficiency using the EPRI boiler tube coupons and presenting documentation of results.
    - 2.2.2.3 To qualify to perform for High Energy Piping inspections to identify early stage creep-damage in HEP, the Technician shall demonstrate proficiency using the Materials Property Counsel (MPC) controlled set of coupons (University of Tennessee, Knoxville, TN)
    - 2.2.2.4 Alternatively, Consultant or NDE service provider may present a documented and effective In-house training program to the responsible Company representative for approval.
- 2.3 All individuals responsible for data acquisition and/or data analysis shall be certified either Level II or Level III in the appropriate discipline. These individuals shall also have documented and verifiable experience applying to the specific type of inspections being performed.
- 2.4 When requested by Company, the Consultant or NDE service provider site staff shall include at least one individual who has extensive experience with the metallurgical aspects of damage mechanisms. This individual shall be a working member of the inspection team and shall additionally add metallurgical expertise to the process of data interpretation.
- 2.5 Proposals for each Work Release issued shall include recommended staffing level to accomplish the work within the allotted schedule, allowing adequate time for supplemental inspections, if needed, to fully characterize all detected indications. Staffing shall include individual(s), as necessary, depending on specific scope and schedule, to perform data acquisition and independent data analysis.

- 2.6 Resumes of all staff from which the inspection team would be selected should be submitted with the proposal. The specific role of each individual should be clearly identified. Company maintains the right to exclude or otherwise restrict utilization of specific individuals solely at the discretion of Company. No substitution of personnel shall be permitted without the Company's written approval.
- 2.7 PacifiCorp uses ATI Aware Software to document boiler and high energy piping inspections. In addition to all other reporting requirements the Consultant or NDE service provider shall submit results in a software format that can be uploaded into the Aware Program.

### **3.0 Reporting of Data**

#### **3.1 Field Reporting of Data:**

- 3.1.1 At the end of each shift, the Consultant or NDE service provider shall submit a daily status report to the Company's Site Representative of the results of each day's inspections:
- 3.1.1.1 Daily status reports for each inspection or evaluation activity for welds and components
  - 3.1.1.2 Prioritized recommendations
  - 3.1.1.3 Work completed on prioritized recommendations.
  - 3.1.1.4 Due to urgency when Service Damage of HEP is identified, a preliminary verbal analysis of results is required immediately.
- 3.1.2 The Consultant or NDE service provider shall provide Company with a preliminary field inspection report at the completion of the field examination. Consultant's or NDE service provider's inspection personnel shall not leave the job site until this preliminary report has been reviewed with Company's Site Representative to allow Company the prerogative of requesting further examinations.
- 3.1.3 The preliminary field report shall include copies of all reader sheets and a summary of the examinations performed (including areas and techniques), a report of all relevant indications and methods of identification. This summary will be in table format listing each weld or component tested, each process used, and the results of each process. Results will be reported using the following wording:

3.1.4 All indications or defects are to be fully described as to locations, sizes and types and shall be reported utilizing the following applicable terminology

3.1.4.1 New and repaired welds, components or materials:

3.1.4.1.1 Acceptable

3.1.4.1.2 Rejected.

3.1.3.2 Material or wall loss:

3.1.4.2.1 Nominal thickness

3.1.4.2.2 Minimum allowable thickness

3.1.4.2.3 Actual wall thickness

3.1.4.2.4 Areas of concern in Red (Report Immediately)

3.1.4.2.5 Company representative shall make the determination

3.1.4.3 Fatigue Service Damage

3.1.4.3.1 No Service Damage

3.1.4.3.2 Size and Location of Crack(s)

3.1.4.4 Creep Service Damage (Advanced Ultrasonics)

3.1.4.4.1 No Relevant Indication (NRI)

3.1.4.4.2 Unknown Damage (PacifiCorp internal used only)

3.1.4.4.3 Light Banding

3.1.4.4.4 Moderate Banding

3.1.4.4.5 Heavy Banding

3.1.4.4.6 Aligned Voids

3.1.4.4.7 Micro Cracking

3.1.4.4.8 Macro Cracking

3.1.4.5 Creep Service Damage (Metallurgical Sample)

3.1.4.5.1 No Damage

3.1.4.5.2 Isolated Voids (size <1.5  $\mu\text{m}$ )

3.1.4.5.3 Light Clustering of Voids (size 1.5 to 2.5  $\mu\text{m}$ )

3.1.4.5.4 Moderate Clustering of Voids (size 2.5 to 3.0  $\mu\text{m}$ )

3.1.4.5.5 Heavy Clustering of Voids (size 3.0 to 3.5  $\mu\text{m}$ )

3.1.4.5.6 Aligned Voids (size 3.5 to 5.5  $\mu\text{m}$ )

3.1.4.5.7 Micro Cracking (size 5.6 to 6.5  $\mu\text{m}$ )

3.1.4.5.8 Macro cracking (size 6.5 to 7.0  $\mu\text{m}$ )

- 3.1.5 Electronic copies of all daily reports and the preliminary written field report will be provided to the Company at completion of the examinations and prior to Consultant or NDE service provider personnel leaving the plant site.

## 3.2 Final Report

- 3.2.1 Within six weeks of completing the field inspection, the Consultant or NDE service provider shall provide a detailed final report of those examinations. The final report shall include, as a minimum, the following information:

- 3.2.1.1 Inspection methodology and procedures incorporated.
- 3.2.1.2 Inspection findings, condition assessment, and documentation of all completed and uncompleted work.
- 3.2.1.3 Recommendations and prioritization for the next overhaul.
- 3.2.1.4 Final report to include (2) hard copies and one (1) electronic copy to plant site and one (1) electronic copy to corporate office.
- 3.2.1.5 Inspection data shall be supplied to Company in the agreed upon format utilizing the same damage/defect descriptions as defined in section 3.1.4 of this specification

## 4.0 Component Description of Work

- 4.1 Boiler tube evaluations shall include sizes and types of boiler tubing to be examined using UT during boiler overhauls will typically be between 1.75” OD and 3.50” OD, between 0.148” MWT and 0.500” MWT, and meet material specifications from ASME, BPVC, Section 1, Power Boilers, Part PG-9, “Pipes, Tubes, and Pressure Containing Parts”.
  - 4.1.1 Dissimilar Metal Welds (DMWs) shall be investigated the entire circumference and completely through-wall thickness of the tubing to assure there is no creep-fatigue damage.
    - 4.1.2.1 Creep-fatigue damage (CFD) typically concentrates along the ferritic (low alloy steel) side of the weld, initiating along the ID surface, the mid-wall of the tube, or along the OD surface.
    - 4.1.2.2 Linear Phased Array (LPA) shall be used for evaluations.



- 4.1.2 Oxide scale measurement (OSM) and performing remaining life calculations of temperature tube requires the accurate measurement of tube wall and steam side scale thickness.
  - 4.1.2.1 The acquisition system must provide for high minimum resolution, typically from 0.005” to 0.030” over the life of the tubing.
- 4.1.3 Life assessment and tube remaining creep life (LARL) is calculated using, a remaining life analysis computer code that assists with the interpretation of the collected ultrasonic signals.
  - 4.1.3.1 Based on analyst input, the software module calculates the tube wall thickness, oxide thickness, and tube remaining life for each analyzed signal. The results are subsequently reported as text documents and database file formats.
  - 4.1.3.2 An effective temperature is determined for each measurement by using a variety of oxide thickness-to-temperature correlations. For PacifiCorp Units, typically the French correlation has been used. Based on this temperature estimate, remaining creep life values are predicted using standard Larson-Miller parameter (LMP) calculations for the appropriate material.
  - 4.1.3.3 The actual prediction of remaining life is based on published stress rupture data typically reported as log stress versus LMP. Because of data scatter, curves are typically plotted through the data to provide minimum and mean remaining life values. For a given stress, exhausted remaining life is predicted to occur when the combination of time and temperature (LMP) reaches the test population.
- 4.1.4 Header Socket Weld of the tube to header socket welds (HSW) shall be performed to detect subsurface damage that can occur at the socket weld root and fusion line.
  - 4.1.4.1 A customized Linear Phased Array (LPA) technique that permits socket interrogation via the tube stub surface shall be used.
  - 4.1.4.2 The circumferential extent of the defect is important since actively growing flaws will exhibit crack propagation in both the radial and circumferential directions.

- 4.1.4.3 The specific location of defects around the tube circumference is important and can provide insight into the potential cause of the cracking.
- 4.2 Boiler Condition Inspections of areas of high priority and estimated manpower requirements will be provided in the individual Work Release for each project. The basic outline will be as follows:
- 4.2.1 Defined areas for UT inspection
  - 4.2.2 Defined areas for Visual Inspection
  - 4.2.3 Component Condition Assessment
  - 4.2.4 Specific Recommendations
- 4.3 High Energy Piping (HEP) is categorized into three types of service damage mechanisms with affected systems, welds or components listed with the affecting service damage mechanisms as follows:
- 4.3.1 Creep Affected
    - 4.3.1.1 Main Steam
    - 4.3.1.2 Hot Reheat
    - 4.3.1.3 Boilers Headers
    - 4.3.1.4 Boiler Leads
    - 4.3.1.5 Boiler Links
    - 4.3.1.6 Turbine Piping
    - 4.3.1.7 Boiler Feed Pump Turbine Piping
  - 4.3.2 Corrosion-Fatigue and Simple Fatigue-Affected
    - 4.3.2.1 Cold Reheat
    - 4.3.2.2 Deaerators
    - 4.3.2.3 Deaerator Storage Tanks
  - 4.3.3 Flow Accelerated Corrosion (FAC)-Affected
    - 4.3.3.1 Feedwater piping and components
    - 4.3.3.2 Condensate piping and components
    - 4.3.3.3 Extraction Steam piping and components
    - 4.3.3.4 Deaerators

- 4.3.3.5 Deaerator Storage Tanks,
- 4.3.3.6 Re-Heat Spray piping and components
- 4.3.3.7 Superheat Spray Lines piping and components
- 4.3.3.8 Heater Vents piping and components
- 4.3.3.9 Heater Drains piping and components
- 4.3.3.10 Boiler Blowdown piping and components,
- 4.3.3.11 Boiler Start-Up piping and components
- 4.3.3.12 Re-Circulation piping and components
- 4.3.3.13 Heater Shells inlet nozzles and surrounding areas

4.4 General Plant and other applications of testing and evaluation methods, processes, and techniques shall be in accordance with the applicable code, Company requirements. Note: Full definitions of acronyms are found in Section 5.0 of this Specification.

4.4.1 New and repaired welds in components and materials with an expected safety and reliability of 30 years. These types of welds are to be evaluated in accordance with design specifications, and the applicable paragraphs of the ASME-BPVC Section V.

4.4.1.1 ASME B31.1 Piping (New and repair welds):

4.4.1.1.1 Butt Welds on NPS >2" (NPS =National Pipe Size)

- VTWLD (Visual Testing Weld)
- MT (Magnetic Testing)
- or
- PT (Penetrant Testing)
- RT (Radiographic Testing)
- or
- LPA (Ultrasonics Testing-Linear Phased Array)

4.4.1.1.2 Butt Welds on NPS < 2"

- VTWLD (Visual Testing Weld)
- MT (Magnetic Testing)
- or
- PT (Penetrant Testing)

4.4.1.1.3 Branch Connections NPS >4

- VTWLD (Visual Testing Weld)
- MT (Magnetic Testing)

or

- PT (Penetrant Testing)
- RT (Radiographic Testing)

or

- LPA (Ultrasonics Testing-Linear Phased Array)

4.4.1.1.4 Branch Connections NPS <4”

- VTWLD (Visual Testing Weld)
- MT (Magnetic Testing)

or

- PT (Penetrant Testing)

4.4.1.1.5 Fillet, Socket, Attachment and Seal

- VTWLD (Visual Testing Weld)
- MT (Magnetic Testing)

or

- PT (Penetrant Testing)

4.4.1.1.6 P91 materials (As applicable)

- VTWLD (Visual Testing Weld)
- MT (Magnetic Testing)

or

- PT (Penetrant Testing)
- RT (Radiographic Testing)

or

- LPA (Ultrasonics Testing-Linear Phased Array)
- HT (Hardness Testing)

or

- PHT ( Portable Hardness Testing)

4.4.1.1.7 Temper Bead Welding on piping (Only allowed if approved by the responsible company representative with a ASME Section IX WPS and supporting PQR)

- VTWLD (Visual Testing Weld)
- MT (Magnetic Testing)

or

- PT (Penetrant Testing)
- RT (Radiographic Testing)

or

- LPA (Ultrasonics Testing-Linear Phased Array)
- HT (Hardness Testing)

or

- PHT ( Portable Hardness Testing)

#### 4.4.1.2 ASME Section I Boiler (New and repair welds):

##### 4.4.1.2.1 Steam or Water: (Subjected to radiant heat)

###### 4.4.1.2.1.1 Longitudinal Welds

- VTWLD (Visual Testing Weld)
  - RT (Radiographic Testing)
- or
- LPA (Ultrasonics Testing-Linear Phased Array)

###### 4.4.1.2.1.2 Girth Drum or Shell Welds, NPS >10" or >1.125" T

- VTWLD (Visual Testing Weld)
  - RT (Radiographic Testing)
- or
- LPA (Ultrasonics Testing-Linear Phased Array)

###### 4.4.1.2.1.3 Girth Tubes, Pipes or Header Welds > NPS 4" or ½" T

- VTWLD (Visual Testing Weld)
  - RT (Radiographic Testing)
- or
- LPA (Ultrasonics Testing-Linear Phased Array)

##### 4.4.1.2.2 Water: (Not subjected to radiant heat)

###### 4.4.1.2.2.1 Girth Tubes, Pipes or Header Welds NPS >10" or >1.125" T

- VTWLD (Visual Testing Weld)
  - RT (Radiographic Testing)
- or
- LPA (Ultrasonics Testing-Linear Phased Array)

##### 4.4.1.2.3 Steam: (Not subjected to radiant heat)

###### 4.4.1.2.3.1 Girth Tubes, Pipes or Header Welds NPS >16" or >1.625" T

- VTWLD (Visual Testing Weld)

- RT (Radiographic Testing)
- or
- LPA (Ultrasonics Testing-Linear Phased Array)

#### 4.4.1.3 ASME Section IIIV Pressure Vessels (New and repair welds):

##### 4.4.1.3.1 Longitudinal and Girth Welds

- VTWLD (Visual Testing Weld)
  - RT (Radiographic Testing)
- or
- LPA (Ultrasonics Testing-Linear Phased Array)

##### 4.4.1.3.2 Nozzle, Fillet and Attachment Welds

- VTWLD (Visual Testing Weld)
  - RT (Radiographic Testing)
- or
- LPA (Ultrasonics Testing-Linear Phased Array)

#### 4.4.1.4 Temper Bead Welding on ASME Sections I and IIIV components (Only allowed if approved the responsible company representative with a ASME Section IX WPS and supporting PQR)

- VTWLD (Visual Testing Weld)
  - MT (Magnetic Testing)
- or
- PT (Penetrant Testing)
  - RT (Radiographic Testing)
- or
- LPA (Ultrasonics Testing-Linear Phased Array)
  - HT (Hardness Testing)
- or
- PHT ( Portable Hardness Testing)

#### 4.4.1.4 Structural Steel (New and repair welds): See AWS D1.1

- VTWLD (Visual Testing Weld)
  - MT (Magnetic Testing)
- or
- PT (Penetrant Testing)
  - RT (Radiographic Testing)
  - UT (Ultrasonics Testing)
  - RT (Radiographic Testing)

#### 4.4.1.5 General Base Metal Repairs (such as Casings, Shafts, Blades)

- PMI (Positive Material Identification)
  - VTWLD (Visual Testing Weld)
  - MT (Magnetic Testing)
- or
- PT (Penetrant Testing)
  - PHT (Portable Hardness Testing)
  - ME (Metallography Evaluation)
  - RT (Radiographic Testing)
- or
- LPA (Ultrasonics Testing-Linear Phased Array)
  - Other methods, processes, and techniques as approved by the Responsible Company Representative

#### 4.5 Service Damage Inspection and Evaluations

##### 4.5.1 Boiler Tube Conditions Inspections:

- VTWLD (Visual Testing Weld)
  - VTBC (Visual Testing Boiler Conditions)
  - VTBO (Visual Testing Boroscopy)
  - UTT (Ultrasonics Testing Thickness)
  - LPA (Ultrasonics Testing-Linear Phased Array)
  - MT (Magnetic Testing)
- or
- PT (Penetrant Testing)
  - Other methods, processes, and techniques as approved by Responsible Company Representative

##### 4.5.2 Creep Affected:

###### 4.5.2.1 Required assurance of safety and reliability – 5-8 years (High Energy systems or components operating at 850°F or greater)

4.5.2.1.1 Girth Welds are evaluated using: first, VTWLD, secondly, MT or PT, and thirdly with Advanced Ultrasonics. The additional testing methods listed are to be utilized at the directions of the responsible Plant and or Corporate HEP Engineers.

- VTWLD (Visual Testing Weld)

- MT (Magnetic Testing)
- or
- PT (Penetrant Testing)
  - UTT(Ultrasonics Testing Thickness)
  - AE (Acoustic Emission Testing)
  - LPA (Ultrasonics Testing-Linear Phased Array)
  - FPAD (Focused Phased Array Depth)
  - PHT (Portable Hardness Testing)
  - Rep (Replication)
  - VTBO (Visual Testing Boroscopying)
  - VTGM (Visual Testing Geometry Measuring)
  - GWUT (Guided Wave Ultrasonics Testing) ME (Metallography Evaluation)
  - Other methods, processes, and techniques as approved by Responsible Company Representative

4.5.2.1.2 Longitudinal Seam Welds are evaluated using: first, with VTWLD, secondly, MT or PT, and thirdly with Advanced Ultrasonics is to be utilized to further evaluate specific locations which are identified by the high stress points along the seam weld. The additional testing methods listed are to be utilized at the directions of the responsible Plant and or Corporate HEP Engineers.

- VTWLD (Visual Testing Weld)
  - MT (Magnetic Testing)
- or
- PT (Penetrant Testing)
  - UTT(Ultrasonics Testing Thickness)
  - AE (Acoustic Emission Testing)
  - LPA (Ultrasonics Testing-Linear Phased Array)
  - FPAD (Focused Phased Array Depth)
  - TOFD (Ultrasonics Testing-Time of Flight Diffraction)
  - PHT (Portable Hardness Testing)
  - Rep (Replication)
  - VTBO (Visual Testing Boroscopying)
  - VTGM (Visual Testing Geometry Measuring)
  - GWUT (Guided Wave Ultrasonics Testing) ME (Metallography Evaluation)
  - Other methods, processes, and techniques as approved by Responsible Company Representative



4.5.2.1.3 Wyes & Branch Connection Welds are evaluated using: first, with VTWLD, secondly, MT or PT, and thirdly with Advanced Ultrasonics as much as possible. The additional testing methods listed are to be utilized at the directions of the responsible Plant and or Corporate HEP Engineers.

- VTWLD (Visual Testing Weld)
  - MT (Magnetic Testing)
- or
- PT (Penetrant Testing)
  - UTT(Ultrasonics Testing Thickness)
  - AE (Acoustic Emission Testing)
  - LPA (Ultrasonics Testing-Linear Phased Array)
  - FPAD (Focused Phased Array Depth)
  - PHT (Portable Hardness Testing)
  - Rep (Replication)
  - VTBO (Visual Testing Boiler Conditions)
  - VTGM (Visual Testing Geometry Measuring)
  - GWUT (Guided Wave Ultrasonics Testing) ME (Metallography Evaluation)
  - Other methods, processes, and techniques as approved by Responsible Company Representative

4.5.2.1.4 Gama Plug, Seal, and Socket Welds are evaluated using: first, with VTWLD, and secondly, MT or PT. The additional testing methods listed are to be utilized at the directions of the responsible Plant and or Corporate HEP Engineers.

- VTWLD (Visual Testing Weld)
  - MT (Magnetic Testing)
- or
- PT (Penetrant Testing)
  - AE (Acoustic Emission Testing)
  - PHT (Portable Hardness Testing)
  - Rep (Replication)
  - VTBO (Visual Testing Boroscopying)
  - VTGM (Visual Testing Geometry Measuring)
  - ME (Metallography Evaluation)
  - Other methods, processes, and techniques as approved by Responsible Company Representative

#### 4.6 Fatigue and Corrosion Fatigue Affected:

#### 4.6.1 Cold Reheat

4.6.1.1 Required assurance of safety and reliability – 5-8 years

4.6.1.2 Girth Welds are evaluated using: first, with VTWLD, secondly, MT or PT, and thirdly with Advanced Ultrasonics. The additional testing methods listed are to be utilized at the directions of the responsible Plant and or Corporate HEP Engineers.

- VTWLD (Visual Testing Weld)
  - MT (Magnetic Testing)
- or
- PT (Penetrant Testing)
  - LPA (Ultrasonics Testing-Linear Phased Array)
  - FPAD (Focused Phased Array Depth)
  - UTT(Ultrasonics Testing Thickness)
  - GWUT (Guided Wave Ultrasonics Testing)
  - ME (Metallography Evaluation)
  - Other methods, processes, and techniques as approved by Responsible Company Representative

4.6.1.3 Longitudinal Seam Welds are evaluated using: first, with VTWLD, secondly, MT or PT, and thirdly with Advanced Ultrasonics is to be utilized to further evaluate specific locations which are identified by the high stress points along the seam weld. The additional testing methods listed are to be utilized at the directions of the responsible Plant and or Corporate HEP Engineers.

- VTWLD (Visual Testing Weld)
  - MT (Magnetic Testing)
- or
- PT (Penetrant Testing)
  - UTT(Ultrasonics Testing Thickness)
  - LPA (Ultrasonics Testing-Linear Phased Array)
  - FPAD (Focused Phased Array Depth)
  - TOFD (Ultrasonics Testing-Time of Flight Diffraction)
  - PHT (Portable Hardness Testing)
  - Rep (Replication)
  - VTBO (Visual Testing Boroscopying)
  - VTGM (Visual Testing Geometry Measuring)
  - ME (Metallography Evaluation)
  - Other methods, processes, and techniques as approved by Responsible Company Representative

4.6.1.4 Wyes & Branch Connection Welds are evaluated using: first, with VTWLD, secondly, MT or PT, and thirdly with LPA as much as possible. The additional testing methods listed are to be utilized at the directions of the responsible Plant and or Corporate HEP Engineers.

- VTWLD (Visual Testing Weld)
  - MT (Magnetic Testing)
- or
- PT (Penetrant Testing)
  - UTT(Ultrasonics Testing Thickness)
  - LPA (Ultrasonics Testing-Linear Phased Array)
  - Other methods, processes, and techniques as approved by Responsible Company Representative

4.6.1.5 Gama Plug, Seal, and Socket Welds are evaluated using: first, with VTWLD, and secondly, MT or PT. The additional testing methods listed are to be utilized at the directions of the responsible Plant and or Corporate HEP Engineers.

- VTWLD (Visual Testing Weld)
- MT or (Magnetic Testing)
- PT (Penetrant Testing)
- Other methods, processes, and techniques as approved by Responsible Company Representative

4.6.2 Deaerator Heaters and Deaerator Storage Tanks

4.6.2.1 Required assurance of Safety and Reliability–5-8 years

4.6.2.2 All Welds

- VTWLD (Visual Testing Weld)
- UTT(Ultrasonics Testing Thickness)
- ACFM Alternating Current Field Measurements)(
- MT or (Magnetic Testing)
- PT (Penetrant Testing)
- Other methods, processes, and techniques as approved by Responsible Company Representative

4.7 Flow-Accelerated Corrosion FAC Affected

4.7.1 EPRI Gridding recommendations shall be followed.

4.7.2 Required assurance of safety and reliability–5-8 years per component

4.7.3 Component evaluations

- UTT(Ultrasonics Testing Thickness)
- RT (Radiographic Testing) for small bore (Company HEP Engineer for procedure)

4.7.4 System survey evaluations

- INCOTEST (An acronym for INSulated Component TEST)
- GWUT (Guided Wave Ultrasonics Testing)
- DDRT (Digital Display RT)

## **5.0 Inspection, Testing and Evaluation Methods Descriptions**

5.1 Destructive Testing

5.1.1 Metallurgical Services (MS) – Is the science of evaluating metals usually in a laboratory setting. Common laboratory testing includes but not limited to:

5.1.1.1 Failure Analysis (FA)

5.1.1.2 Chemical Analysis (CA)

5.1.1.3 Physical Property Tests (PPT)

- Tensile Testing (TT)
- Bend Testing (BT)
- Hardness Testing (HT)
- Notch Toughness Testing (NT)
- Portable Hardness Testing (PHT)

5.1.2 Service Condition Metallography Evaluation (ME) - Is the science and art of preparing a metal grinding, polishing, and etching to reveal micro-structural constituents. After preparation, the sample can easily be analyzed using optical or electron microscopy. A skilled technician is able to identify alloys and predict material properties, as well as processing conditions. Metallography sample is obtained by removing a portion of the metal. The common terminology is Plug or Boat sample. (Also see “Replication” in the NDE section of this Specification).

- 5.1.3 Replication (Rep) - is a form of non-destructive testing which provides a metallographic replica of the surface microstructure of a material.
- 5.1.4 Positive Material Identification (PMI) – PMI quickly and accurately identifies the composition of more than 100 different engineering alloys and can be performed on site.
  - 5.1.4.1 X-Ray Fluorescence (XRF) - X-ray fluorescence is a technique of chemical analysis. An X-ray beam is aimed at the surface of an object which causes secondary (fluorescent) X-rays to be generated. Each element present produces X-rays of different energies. These X-rays are detected and displayed as a spectrum of intensity against energy: the positions of the peaks identify which elements are present and the peak heights identify how much of each element is present.
  - 5.1.4.2 Spark Emission Spectrography (SES) - Is used to analyses elements in solid metals. An electric arc or spark is passed through a sample, heating it to a high temperature exciting the atoms. In modern spark sources with controlled discharges under an argon atmosphere SES is considered quantitative. Both qualitative and quantitative spark analysis are widely used for production quality control in foundries and steel mills.
- 5.1.5 Engineering Services (ES) – Includes stress analyses, special repair plans, engineering inspections and evaluations such as warping, bulging, and ovality.
- 5.2 Nondestructive Examination (NDE) -
  - 5.2.1 Acoustic Emission Testing (AE) - A method of nondestructive testing that uses mechanical waves moving through materials. Sensors attached on the surfaces of the material detect these waves, known as acoustic emission signals. The Signals emitted by active cracks are then analyzed based on the frequency, amplitude and location.
  - 5.2.2 Acoustic Pulse Reflectometry (APR) - Is based on the measurement of one-dimensional acoustic waves propagating in tubes. Any change in the cross sectional area in the tubular system creates a reflection, which is then recorded and analyzed in order to detect defects.
  - 5.2.3 Alternating Current Field Measurements (ACFM) – The use of ACFM provides reliable detection and sizing of cracks in metallic components. There is no weld or base metal cleaning required. ACFM effectively provides readings through paint, coatings, scale and process related residue. The

technique yields excellent sensitivity and is able to determine defect width, length, and depth up to 3/16 of an inch. The Air multidirectional array sensor is to be used.

- 5.2.4 Eddy Current Testing (ET) - In standard eddy current testing, a circular coil carrying an AC current is placed in close proximity to an electrically conductive specimen. Variations in the electrical conductivity or magnetic permeability of the test object, or the presence of any flaws, will cause a change in eddy current flow and a corresponding change in the phase and amplitude of the measured current. This is the basis of standard (flat coil) eddy current inspection.
- 5.2.5 INCOTEST (NCT) – (An acronym for INSulated Component TEST) is a unique corrosion survey method that allows ferrous pipes and vessels to be surveyed without the time and expense of removing insulation, asbestos, fireproofing concrete or similar coatings.
- 5.2.6 Magnetic Flux Leakage Testing (MFL) - A magnetic field is passed through ferromagnetic steel, flux leakage caused by pitting and corrosion is detected by MFL detectors in the scanning unit and displayed for the operator.
- 5.2.7 Liquid Penetrant Testing (PT) - Is used to reveal surface breaking flaws by bleedout of a colored or fluorescent dye from the flaw and contrasted between developers. Test objects are coated with visible or fluorescent dye solution the excess dye is then removed and a developer is applied. The developer acts as blotter, drawing trapped penetrant out of imperfections.
  - 5.2.7.1 Visible Color Dyes (CD)
  - 5.2.7.2 Fluorescent Dyes (FD) - enable viewing under a UV lamp.
- 5.2.8 Magnetic Particle Testing (MT) – A nondestructive examination method applied to detect cracks and other discontinuities on or near the surfaces of ferromagnetic materials.
  - 5.2.8.1 Dry Particle (DP) - materials commonly used are black iron particles and red or yellow iron oxides.
  - 5.2.8.2 Wet Fluorescent (WF) - materials enable viewing under a UV lamp.
- 5.2.9 Radiography Testing (RT) - This technique involves the use of penetrating gamma or X-radiation to examine parts and products for imperfections.

- 5.2.9.1 Computed Tomography (CT) - Computed Tomography (CT) is a powerful nondestructive evaluation (NDE) technique for producing 2-D and 3-D cross-sectional images of an object from flat X-ray images. Characteristics of the internal structure of an object such as dimensions, shape, internal defects, and density are readily available from CT images.
- 5.2.9.2 Digital Display RT (DDRT) - is a form of x-ray imaging, where digital X-ray sensors are used instead of traditional photographic film. Advantages include time efficiency through bypassing chemical processing and the ability to digitally transfer and enhance images. Also less radiation can be used to produce an image of similar contrast to conventional radiography.
- 5.2.9.3 Distributed Source Positron Annihilation (DSPA) – Uses a positron source emitter to deposit positrons into the subject material. The process is similar to PIPA after the positrons are deposited and attracted to nano-sized defects in the material. DSPA technology can detect fatigue, embrittlement, and other forms of structural damage in materials at the atomic level, before cracks appear.
- 5.2.9.4 Photon Induced Positron Annihilation (PIPA) - Photon Induced Positron Annihilation (PIPA) involves penetrating materials with a photon beam which are attracted to nano-sized defects in the material. The positrons collide with electrons in the material and are annihilated, releasing energy in the form of gamma rays. The gamma ray energy spectrum creates a distinct and readable signature of the size, quantity and type of defects present in the material. PIPA technology can detect fatigue, embrittlement, and other forms of structural damage in materials at the atomic level, before cracks appear.
- 5.2.9.5 Neutron Radiography (NR) - is an imaging technique which provides images similar to X-ray radiography. The difference between neutron and X-ray interaction mechanisms produce significantly different and often complementary information.
- 5.2.9.6 Traditional (RT) - An X-ray machine or radioactive isotope is used as a source of radiation. Radiation is directed through a part and onto film. The resulting shadowgraph shows the internal soundness of the part. Possible imperfections are indicated as density changes in the film.

5.2.9.7 X-ray Diffraction (XRD) - is a versatile, non-destructive technique that reveals detailed information about the chemical composition and crystallographic structure of natural and manufactured materials.

5.2.10 Ultrasonic Testing (UT) – The examination of materials by introducing ultrasonic waves into, through, or onto the surface of the article being examined and determining various attributes of the material from effects on the ultrasonic waves.

5.2.10.1 Focused Phased Array Depth - (FPAD) utilizes transducers that have multiple elements, each having its own pulsar and receiver and is controlled by a computerized system. By timing, or phasing the individual elements, various converging wavefronts can be created. Using varied phase patterns, different focal depths can be achieved. Data may be interpreted and analyzed by qualified individuals or by means of computer software. FPAD is typically used to evaluate early stage creep damage in High Energy Piping.

5.2.10.2 Automated Ultrasonic Testing (AUT) – uses an automated mechanical tracking device and or a system that gathers and records the data.

5.2.10.3 Guided Wave UT (GW) - Uses low frequency guided waves to detect thickness changes caused by corrosion/erosion and or weld locations in piping. A band comprising five rings of piezoelectric transducers is clamped around the pipe and ultrasound is sent in both directions along the pipe. Three of the rings excite longitudinal waves in the pipe and two excite torsional waves. The signals are displayed from three different wave modes, namely symmetrical, horizontal flexural and vertical flexural. The signal obtained is similar to a conventional ultrasonic A-scan, where the horizontal axis represents distance along the pipe and the vertical axis represents thickness change.

5.2.10.4 Linear Phased Array– (LPA) utilizes a transducer that has multiple elements, each having its own pulsar and receiver and is controlled by a computerized system. By timing, or phasing the individual elements, various converging wavefronts can be created. Using varied phase patterns, different focal points can be achieved. Recently LPA is often utilized when RT is not practicable.

5.2.10.5 Pulse-Echo Imaging (EPI) - Using standard ultrasonic probes, pulse-echo thickness measurement and weld inspection with a



position encoder and appropriate software produces images of flaws which can be electronically saved.

- 5.2.10.6 Shear Wave or A-SCAN UT (SW) – An ultrasonic wave is transmitted at a predetermined angle into the test material. Surfaces normal to the beam path and corner-traps reflect the wave energy back to the transducer. The display shows the distance the wave traveled to the imperfection and the relative strength of the energy.
- 5.2.10.7 Time of Flight Diffraction – (TOFD) the detection of flaws based on analyzing the arrival time of diffracted sound waves emitted from a flaw's extremities.
- 5.2.10.8 Thickness Measurements (UTT) - are performed using a conventional flaw detector and a compression wave probe, which sends longitudinal waves into the component at normal incidence to the surface. Signals are displayed on the flaw detector screen in the form of an A-scan, in which the horizontal axis represents distance and the vertical axis represents signal amplitude. Since a 0° compression probe is being used, the horizontal axis is equivalent to depth from the scanning surface. For FAC see EPRI Gridding Recommendations.
- 5.2.11 Thermography (TG) - is the use of an infrared imaging and measurement camera to "see" and measure thermal energy emitted from an object.
- 5.2.12 Visual / Optical Testing (VT) - is used extensively to evaluate the condition or the quality of a weld or component. It is easily carried out, inexpensive and usually doesn't require special equipment. It requires good vision, good lighting and the understanding and knowledge of what to look for.
  - 5.2.12.1 Welds (WLD) Note: Technicians must be AWS CWI or Company approved
  - 5.2.12.2 Geometry Measuring (GM)
  - 5.2.12.3 Boroscopying (BO) Note: Technicians must be Company approved
  - 5.2.12.4 Boiler Conditions (BC) Note: Technicians must be Company approved
  - 5.2.12.5 Pressure Vessels Conditions (PV) Note: Technicians must be Company approved

5.2.12.6 Piping Conditions (PC) Note: Technicians must be Company approved

5.2.12.7 Hangers (HNG) Note: Technicians must be Company approved

**Attachment 1 to Exhibit A**  
**Scope of Work**  
**Inspection and Acceptance Criteria for Conducting Linear Phased Array (LPA)**  
**Examinations of Boiler Tubing Welds**

**Purpose**

The purpose of this document is to provide the required criteria and a general scope of work for services to be provided by a Consultant or Non-Destructive Examination (NDE) service provider.

**Project Scope of Work**

The Consultant or NDE service provider shall comply with all the requirements of the Scope of Work Specification for Examination of Boiler Components, High Energy Piping and General Plant Equipment Document

A Work Release, for each project shall be issued by Company. The project description will be provided by Company for each Work Release which will include a general outline of the services to be provided.

The Linear Phased Array (LPA) technique of examining boiler tube welding conducted during boiler overhauls is the primary focus of this Scope of Work.

**Consultant or NDE Service Provider Responsibilities**

Consultant or NDE service provider shall provide all labor, PPE, materials, and equipment (including supplemental lighting and extension cords) necessary to perform required examinations.

Erection of scaffolding, removal of insulation, and general surface preparation will be provided by Company, unless otherwise noted in the individual Work Release.

Consultant or NDE service provider shall be responsible for obtaining the necessary calibration blocks, at least one week prior to the inspection.

Consultant or NDE service provider shall provide Company with a list of chemical products to be used in these inspections, the Material Safety Data Sheets for these products, and any special storage or disposal requirements.

Consultants or NDE service provider's personnel shall be trained in accordance with OSHA requirements, and will be required to attend the Company Safety training course prior to entering the plant.

Consultant or NDE service provider shall notify Company, at least one week prior to the inspections, of any special auxiliary services (i.e., water, electrical or compressed air) which will be needed for Consultant to perform these inspections.

Consultant or NDE service provider is required to schedule their requirements with Company.

If NDE or other work is being conducted by Company or others, concurrent with Consultant's inspection, Consultant is expected to make reasonable accommodations for these concurrent inspections.

Company may perform examinations based upon the Consultant's findings; therefore, Consultant is required to schedule their efforts to complete the examinations at each location prior to moving to other locations, unless approved by Company's site representative.

Reporting of results and damage shall be in accordance with section 3.0 of the Scope of Work Specification for Examination of Boiler Components, High Energy Piping and General Plant Applications Document

### **Personnel Qualifications**

LPA Technicians performing and/or evaluating LPA examinations shall be qualified in accordance with the American Society of Non-destructive Testing Recommended Practices # SNT-TC-1A. All individuals responsible for data acquisition and/or data analysis shall be certified ASNT Level II technician or above.

LPA Technicians shall also demonstrate their ability to perform LPA on the Company Flawtech Coupons. Alternatively the responsible company represented may approve other methods of qualification than testing using the Company Flawtech Coupons.

Proposals for each Work Release issued shall include recommended staffing level to accomplish the work within the allotted schedule, allowing adequate time for supplemental inspections, if needed, to fully characterize all detected indications. Staffing shall include individual(s), as necessary, depending on specific scope and schedule, to perform data acquisition and independent data analysis.

Resumes of all staff from which the inspection team would be selected should be submitted with the proposal. The specific role of each individual should be clearly identified. Company maintains the right to exclude or otherwise restrict utilization of specific individuals solely at the discretion of Company. No substitution of personnel shall be permitted without the Company's written approval.

### **Testing Requirements for Welded Repairs in Company Boilers**

Welding of boiler tubing conducted during planned overhauls in Company boilers is performed to the requirements of the National Board Inspection Code (NBIC), ANSI/NB-23.

Company's standard Quality Assurance procedures require that boiler contractor quality control personnel conduct a visual examination on each weld at the fit-up, root pass, and final cap stages of welding.

This visual inspection, along with quality LPA inspections, will provide sufficient examinations to verify the quality and integrity of contractor tube welding during planned overhauls.

### **Ultrasonic Testing (UT) – Linear Phased Array (LPA) Technical Description**

For boiler tube welds conducted during major overhauls “linear phased array” (LPA) ultrasonic testing shall be used for the detection and characterization of crack and non-crack like indications.

Ultrasonic examination (UT) is accomplished through the use of transducers which introduce high frequency sound waves into the material being examined. These sound waves travel through the material and are reflected at interfaces such as the back side (inside) of the part or as the reflections created by cracks or other flaws.

An “array” is a type of ultrasonic transducer that has been divided into many individual parallel elements. These elements are individually pulsed to simulate many different conventional probes, thus inspecting a large portion of the weld.

The output image from a LPA unit is a type of polar sweep known as a “sector scan”. Using LPA, a slice of a tube weld can be scanned electronically in milliseconds.

The LPA examinations of boiler tube welding during boiler overhauls shall be in accordance with the American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code (BPVC), Section 5, Nondestructive Examination, Article 4 – “Ultrasonic Examination Methods of Welds”.

### **Size and Type of Boiler Tubing to be Examined using LPA Techniques**

Boiler tubing to be examined during boiler overhauls will typically be between 1.75” OD and 3.50” OD, between 0.148” MWT and 0.500” MWT, and meet material specifications from ASME, BPVC, Section 1, Power Boilers, Part PG-9, “*Pipes, Tubes, and Pressure Containing Parts*”.

### **Acceptance/Reject Criteria for LPA Examinations of Boiler Tube Welds**

Personnel performing LPA examinations shall exhibit proof of competence through the use of training standards provided by Company. These training standards shall consist of tube weld samples containing known flaws. NDE personnel shall prove their ability to determine acceptance or rejection of these flaws at a 95% rate. The Acceptance/Reject Criteria for LPA Examination are as follows:

- **Crack-like, Incomplete Penetration and Lack of fusion Indications,**

- Rejectable
- **Non-crack-like Indications**
  - i.e. slag inclusion, porosity, etc.
  - Tube MWT < .250", indications exceeding ¼" in length with a height > 1/16",
  - Tube MWT > .250", indications exceeding ¼" in length with a height > 1/8".
- **I.D. variations,**
  - i.e. root concavity, weld reinforcement, etc.:
  - Concavity on the root surface of single-welded butt joints is permitted if the depth of the concavity of the weld metal does not exceed the lesser of 3/32" or 20% of the thinner of the two sections being joined when the resulting thickness of the weld is at least equal to the thickness of the thinner member of the two sections being joined.
  - Abrupt transitions to concavity are not acceptable.
  - Weld reinforcement shall apply to the internal surface as well as the external, and shall not exceed the limits as specified in the ASME applicable code section, or,
  - Tubing material ≤ .375" MWT shall not exceed 1/16" internal weld reinforcement.

The responsible company represented may approve or establish varying criteria from those identified above.

### **Daily On-Site Reporting Requirements**

In order to assist the boiler contractor QC personnel to meet the inspection requirements, as specified by the Company QA/QC Welding Requirements for Boiler Overhauls document, the NDE contractor personnel, performing the LPA inspections will provide the boiler contractor personnel a daily list (reader sheet) of welds that have been examined by the LPA technique.

This reader sheet will contain the following information:

- Location of the weld by boiler system, i.e. low temp superheat, reheater, front coutant slope, etc.
- Weld identification, i.e. tube number, pendent or assembly number, weld elevation, etc.
- Welder(s) identification, i.e. CM, MC, RS, 1234, etc. (any random LPA examinations conducted by the NDE contractor personnel will be marked as "random" for welder identifications.
- Material specification, i.e. SA210-A1, 2.5" O.D., .220" MWT, etc.
- Date of LPA weld examination.
- Results of the examination, which will include:
  - Defect or discontinuity found during examination,
  - Location of discontinuity or defect found during examination,
  - Either acceptance or rejection of the tube weld, per the Company Linear Phased Array criteria,
  - Disposition of rejected weld, including date of re-examination, and acceptance or rejection.

## **Final Report**

NDE Contractor shall provide a final report of LPA examinations of all tube welding conducted during boiler overhaul.

This report shall include the following information:

- Total number of welds examined,
- Total number of welds examined per boiler component, i.e. low temp superheat, reheater, front coutant slope, etc.,
- Total number of rejected welds found during the examinations,
- Total number of rejected welds per boiler component,
- Flaw characterization of rejected welds found during examinations,
- Flaw characterization of rejected welds per boiler component,
- Contractor QA verification of final results.

Electronic copies of all daily reports and the final report will be provided to the Company at completion of the examinations and prior to NDE Contractor LPA personnel leaving the plant site.

END OF DOCUMENT

## **Attachment 4 to Exhibit A Scope of Work General NDE Services**

### **Purpose**

The purpose of this document is to define a general scope of work for NDE services, as well as establish minimum criterion, specifications and standards by which these services shall be performed.

### **Project Scope of Work**

The Company requires NDE services on an as needed basis. The NDE services may be performed on any general plant applications as determined by the responsible engineer or manager.

The Consultant or NDE service provider shall comply with all applicable sections of the Scope of Work Specification for Examination of Boiler Components, High Energy Piping and General Plant Equipment Document

A Work Release, for each project shall be issued by Company. The project description will be provided by Company for each Work Release which will include a general outline of the services to be provided.

Depending on the urgency preliminary verbal analysis or written summary of results may be required.

In all cases a thorough written report describing the analysis procedure and results will be submitted to the company representative.

### **Consultant or NDE Service Provider Responsibilities**

Consultant or NDE service provider shall provide all labor, PPE, materials, and equipment (including supplemental lighting and extension cords) necessary to perform required examinations.

Consultants or NDE service provider's personnel shall be trained in accordance with OSHA requirements, and will be required to attend the Company Safety training course prior to entering the plant.

Erection of scaffolding, removal of insulation, and general surface preparation will be provided by Company, unless otherwise noted in the individual Work Release.

Consultant or NDE service provider shall be responsible for obtaining the necessary calibration blocks. At least one week prior to the inspection,

Consultant or NDE service provider shall provide Company with a list of chemical products to be used in these inspections, the Material Safety Data Sheets for these products, and any special storage or disposal requirements.



Consultant or NDE service provider shall notify Company, at least one week prior to the inspections, of any special auxiliary services (i.e., water, electrical or compressed air) which will be needed for Consultant to perform these inspections.

Consultant or NDE service provider is required to schedule their requirements with Company.

If NDE or other work is being conducted by Company or others, concurrent with Consultant's inspection, Consultant is expected to make reasonable accommodations for these concurrent inspections.

Company may perform additional examinations based upon the Consultant's findings; therefore, Consultant is required to schedule their efforts to complete the examinations at each location prior to moving to other locations, unless approved by Company's site representative.

### **Technical Requirements**

Personnel performing NDE shall be qualified in accordance with the latest revision of the American Society of Non-destructive Testing Recommended Practices # SNT-TC-1A.

All individuals responsible for data acquisition and/or data analysis shall be certified either Level II or Level III in the appropriate discipline. These individuals shall also have documented and verifiable experience applying the specific inspections for high energy piping inspection.

No portion of the Scope of Work may be subcontracted to other vendors nor may contract technical support be utilized without Company's approval.

END OF DOCUMENT

**Confidential**  
**Exhibit B**

Pricing Schedule

**THE ENTIRE EXHIBIT B IS CONFIDENTIAL IN  
ACCORDANCE WITH WAC 480-07-160 AND WILL  
BE PROVIDED SEPARATELY.**

# **Exhibit C1**

**FORM OF PURCHASE ORDER  
PACIFICORP**

**PacifiCorp**  
**Procurement**  
 825 NE Multnomah Street, Suite 940  
 Portland, Oregon 97232

# Purchase Order

**Shipping Address**

--

**Vendor Address**

CONTRACTOR  
 DALLAS, TX 97654  
 USA  
 Vendor Phone:  
 Vendor Fax:

**Billing Address**

PacifiCorp  
 Accounts Payable Department  
 P.O. Box 3040  
 Portland, OR 97208 - 3040

**Information**
**P.O. Number**

Date 01/01/2011  
 Vendor No.  
 Payment Terms Description NET 30

Buyer  
 Phone  
 Fax

Delivery Date 01/01/2011  
 Inco Terms Description N/A  
 Inco Terms (Part X) N/A

**Show the Purchase Order Number on all packages, invoices, bills of lading and correspondence. Send invoices to Accounts Payable Department. Notify buyer immediately: (1) if unable to ship or deliver on dates specified below or (2) when description is incorrect or superceded.**

ALL TERMS AND CONDITIONS OF THIS PURCHASE ORDER WORK RELEASE WILL BE GOVERNED BY THE GENERAL SERVICES CONTRACT EXECUTED BETWEEN PACIFICORP AND CONTRACTOR.

This Work Release is entered into by and between ("Contractor") and PACIFICORP ("Company").

Reference Exhibit A, Scope of Work or the applicable Scope of Work referenced herein for definition of work to be performed.

Reference Exhibit C of the General Services Contract or the applicable pricing schedule referenced herein for pricing applicable to this Release.

To facilitate prompt payment, ensure all invoices list the Purchase Order Work Release Number and are addressed and/or emailed to:

PacifiCorp Energy  
 c/o \_\_\_\_\_

**Currency: USD**

Valid From: 01/01/2011 To: 12/31/2011

Item	Material/Description	Quantity	UM	Net Price	Per	UM	Net Amount
10	General Services Release Order Against Contract: 460000XXXX	1.00	SVC	0.00	1	SVC	0.00

**PacifiCorp**  
**Procurement**  
**825 NE Multnomah Street, Suite 940**  
**Portland, Oregon 97232**

# Purchase Order

- 05/14/2009

<b>Total Net Value</b>	USD 0.00
------------------------	----------

Vendor shall furnish the Goods and Services specified above in accordance with this Purchase Order, including the provisions set forth on the face hereof and any other provisions attached to, incorporated into, or otherwise made a part of this Purchase Order.

This Purchase Order shall be governed by the terms and conditions of the Master Agreement executed by the parties to this Purchase Order and to which the items in this Purchase Order are identified.

# **Exhibit C2**

**FORM OF PURCHASE ORDER  
MIDAMERICAN ENERGY COMPANY**



VENDOR PLEASE NOTE:  
 PLEASE ENTER THIS PURCHASE ORDER SUBJECT  
 TO THE ACCOMPANYING TERMS AND CONDITIONS.

BILL TO:  
 PO BOX 8008  
 SIOUX CITY, IA 51102

**PURCHASE ORDER**  
 PURCHASE ORDER NO. 011  
 REV. 03/02  
 THE MIDAMERICAN ENERGY WILL  
 INVOICE FACTORY, SITE, MATERIALS AND  
 CORRESPONDENCE RELATIVE TO THIS ORDER.

VENDOR #		PAYMENT TERMS		FREIGHT TERMS		F.O.B.		SHIP VIA	
CURRENCY		VENDOR CONTACT INFORMATION		VENDOR PHONE NUMBER		FAX NUMBER		PROCESSED BY	
ITEM NUMBER		PART NUMBER		DESCRIPTION		DELIVERY DATE		QUANTITY	
								UOM EA	
								UNIT PRICE	
								EXTENDED PRICE	
								TAX	
BUYER		PHONE NUMBER		FAX NUMBER		EMAIL ADDRESS		AUTHORIZED SIGNATURE	
								Approved: _____	
								TOTAL:	



PURCHASE ORDER

Sierra Pacific Power Company d/b/a NV Energy (NVE)

Send Invoice To:
NV Energy, Accounts Payable
PO BOX 10100
RENO NV 89520-0024

Purchase Order : 00146515R00008
Revision : Release : 00008
Date Printed : 11/22/13
Page Number : 1

Counterparty:
ATTN SALES
PO BOX 7900
SAN FRANCISCO CA 94120

Please Direct Inquiries to:
LISA TOY
Title : PURCHASING AGENT I
Dept : Procurement
Phone: (702) 402-5415 Ext:
Fax : (702) 402-0626
ltoy@nvenergy.com

\*\*\* BLANKET ORDER RELEASE \*\*\*

Payment Terms : % Days Net 30 Days ERS: N Ref Contract:

Primary Ship To: SIERRA PACIFIC POWER COMPANY
Deliver 6:30am - 1pm, M-F only
Valmy Power Station
I-80, Stonehouse Exit 212
North Valmy NV 89438
ATTN:Receiving

Transit type : BEST WAY - SHIPPER'S OPTION
FOB : DESTINATION, FREIGHT PREPAID CHARGED

Carrier Name :
FOB Point : DESTINATION

Instructions & Notes

This Blanket Purchase Order is written
as an Invoice and Funding reference.
Please Reference PO and RELEASE
on all invoices.

\*
PLEASE NOTE: MAY CONTAIN MULTIPLE
'SHIP TO' ADDRESSES

\*
Purchasing POC:
Lisa Toy 702.402.5415

\*

Table with 7 columns: Line, Qty, UP, Catalog ID, Unit Price, Extension, TAXABLE. Row 1: 0001, 2, EA, 0000133189, Unit Price, Extension, TAXABLE

Qty: 2 Delivery Date: 11/22/13

Description:

\* \* \* \* \*





PURCHASE ORDER

Sierra Pacific Power Company d/b/a NV Energy (NVE)

Send Invoice To:
NV Energy, Accounts Payable
PO BOX 10100
RENO NV 89520-0024

Purchase Order : 00146515R00008
Revision : Release : 00008
Date Printed : 11/22/13
Page Number : 2

Mfr/Vendor : \* \* \* \* \*
Model :
Part : 97000-030/9156BNWP

Purchase Order Total Amount

TOTAL THIS PO: \* \* \* \* \*

\* \* \* End of Purchase Order \* \* \*

Counterparty's written acceptance, delivery of goods or services, or performance of this Purchase Order creates a contract. NV Energy's Standard Purchase Order Terms and Conditions apply.

This Purchase Order may be used to accept formal offers submitted in response to a Request for Proposal (RFP), or to fund bilaterally executed contracts. In such cases, the terms and conditions of the RFP or the Contract apply and take precedence over NV Energy's Standard Purchase Order Terms and Conditions.

LISA TOY
Designated Buyer

The parties agree that this Purchase Order shall be governed by the Terms and Conditions located at:
http://www.nvenergy.com/company/doingbusiness/suppliers/index.cfm
which are incorporated herein by reference. Seller represents by its execution hereof or performance hereunder that it has read and agrees to be bound by such terms and conditions.

**EXHIBIT C-3  
FORM OF RELEASE  
PACIFICORP**

Release No. [\_\_\_\_\_]

This release (“Release”) is entered into by and between PacifiCorp (“Company”) and Metalogic Inspection Services LLC (“Consultant”).

**RECITALS**

- A. Consultant and Company entered into that certain Professional Services Contract No. 4600003245 (“Contract”) effective as of [\_\_\_\_\_].
- B. Pursuant to ARTICLE 3 of the Contract, Consultant and Company desire to identify certain work (the “Work”) to be performed by Consultant pursuant to the Contract and to reach certain other understandings with respect to the Work.
- C. Capitalized terms used but not defined herein have the meanings ascribed thereto in the Contract.

**AGREEMENT**

It is therefore agreed as follows:

1. Scope of Work and Location:

Consultant shall perform the Work and furnish all Equipment as specified in the Scope of Work, attached hereto as Attachment 1 – Scope of Work.

Consultant will furnish all Equipment for the Work, except those materials specifically identified in Exhibit [\_\_].

The location where the Work is to be performed is Company’s **[insert name/description of Work Site]**.

2. Period of Performance of Work:

The period of performance begins upon execution of this Release, and Consultant shall complete the Work on or before **[insert Work completion date]**.

3. Designated Representatives:

Consultant: Metalogic Inspection Services LLC  
 Attention: Ryan Brashier, Regional Manager of US Operations (Denver Colorado)  
[RBrashier@metalogicinspection.com](mailto:RBrashier@metalogicinspection.com)  
 720-660-1211  
 1148 South Clarkston Street  
 Denver, Colorado 80210

Company: [\_\_\_\_\_  
 [\_\_\_\_\_  
 [\_\_\_\_\_  
 Telephone [\_\_\_\_\_]

4. Pricing:

As consideration for the satisfactory performance of Consultant's obligations under this Release, Company shall pay Consultant \$[\_\_\_\_\_]. Complete pricing detail is referenced in Attachment 2 – Pricing.

5. Payment/Retention Provisions:

The following special payment and/or retention provisions shall apply:

[ \_\_\_\_\_  
\_\_\_\_\_ ]

6. Access Requirements:

The Work will require:

- Authorized unescorted physical access to Company's Facilities
- Authorized cyber access to Company's CIPS Covered Assets

7. Additional Terms and Conditions Applicable to the Performance of the Work (e.g., additional insurance requirements, liquidated damages, etc.):

[ \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ ]

IN WITNESS WHEREOF, this Release has been executed by the duly authorized representatives of the parties and shall be effective as of the date executed by Company.

CONSULTANT:  
METALOGIC INSPECTION SERVICES LLC

COMPANY:  
PACIFICORP

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

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

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

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

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

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

Date: \_\_\_\_\_

Date: \_\_\_\_\_

Attachment 1 – Scope of Work

Attachment 2 – Pricing

**ATTACHMENT 1**

**SCOPE OF WORK**

**ATTACHMENT 2**

**PRICING**

**EXHIBIT D**  
**LETTER OF CREDIT TERMS**

The following are the terms and conditions required by Company when establishing a Letter of Credit.

- Company must approve the issuing bank.
- Applicant (*i.e.*, Consultant) name appearing in the Letter of Credit and Contract must be EXACTLY the same.
- If issuing bank is located outside the United States (U.S.) then it must be confirmed by U.S. banking institution approved by Company.
- It is to be an Irrevocable Standby Letter of Credit in favor of Company.
- Drafts are payable at sight.
- The expiry date must be no earlier than twelve (12) months from date of issuance.
- Partial and multiple drawings are permitted.
- The Letter of Credit is available by Company's draft (s) at sight when accompanied by a copy of an invoice and one of the two following statements, signed by a representative of Company, reading as follows:
  1. We hereby certify that the Applicant has violated the terms and conditions of the Contract dated month/date/year. The undersigned, an authorized representative of Company (Beneficiary) hereby certifies that the Applicant has failed to comply with and/or violated the terms and conditions of that certain Contract (s) signed by and between the Applicant and Beneficiary and the amount of the accompanying draft drawn under Letter of Credit No. #0000000 represents the amount the Beneficiary is entitled to draw on the Letter of Credit as a result of the occurrence of such failure to comply and/or violation; or
  2. Applicant has not renewed or provided to Beneficiary an acceptable replacement Letter of Credit within thirty (30) days of expiration of the original Letter of Credit No. 0000000.
- In all events the issuing bank will fund the draw of the beneficiary within twenty-four (24) hours of presentment.
- The Letter of Credit will provide for the beneficiary to deliver the required documents to fund the draw by either mail or courier with the address of the issuing bank stated as the point of delivery.

**End of Exhibit D**

## Exhibit E

### AFFILIATES LIST AND PRINCIPAL BUSINESS ADDRESS

Berkshire Hathaway Energy  
666 Grand Avenue, Suite 500  
Des Moines, IA 50309-2580

CalEnergy Generation  
7030 Gentry Road  
Calipatria, CA 92233

CalEnergy Philippines  
24 Floor, 6750 Building  
6750 Ayala Avenue  
Makati, Metro Manila  
Philippines 1226

HomeServices of America, Inc.  
333 South 7th Street, Suite 2700  
Minneapolis, MN 55402

Kern River Gas Transmission Company  
2755 East Cottonwood Parkway, Suite 300  
Salt Lake City, UT 84121

Metalogic Inspection Services  
400, 10525- 170 Street  
NW Edmonton Alberta  
Canada, T5P 047

MidAmerican Energy Company  
666 Grand Avenue, Suite 500  
Des Moines, IA 50309-2580

MidAmerican Renewables, LLC  
666 Grand Avenue, Suite 500  
Des Moines, IA 50309-2580

MidAmerican Transmission  
825 NE Multnomah Street, Suite 1600  
Portland, OR 97232

Nevada Power Company  
dba NV Energy  
6226 West Sahara Avenue  
Las Vegas, NV 89146

Northern Natural Gas Company  
1111 South 103rd Street  
Omaha, NE 68124-1000

Northern Powergrid  
Lloyds Court  
Newcastle  
United Kingdom  
50322-7916

PacifiCorp  
825 NE Multnomah Street, Suite 400  
Portland, OR 97232

Sierra Pacific Power Company  
dba NV Energy  
6100 Neil Road  
Reno, NV 89511

## **Exhibit F**

### **2014 Berkshire Hathaway Energy Company**

#### **Affiliate Participation Letter**

TO:

Metalogic Inspection Services LLC

This letter confirms the intent of [AFFILIATE] to participate in and utilize the contract documents of the Metalogic Inspection Services LLC contract (the "Contract") between Berkshire Hathaway Energy Company and Metalogic Inspection Services LLC that became effective [DATE]. We have reviewed the terms and conditions of the Contract in detail and agree to abide by them. It is understood and agreed that each Affiliate participating in this Contract is solely responsible and liable for its own purchases and payment to the appropriate entity for products or services provided to that Affiliate. Berkshire Hathaway Energy Company and the other Affiliate companies shall have no liability for payment or other obligations, contractual or otherwise, incurred by the specific Affiliate.

Further, we agree and acknowledge that the terms, conditions, and applicable appendices or exhibits set forth in the Contract will apply to Metalogic Inspection Services LLC and (AFFILIATE). As a participating majority-owned Affiliate, in return for Metalogic Inspection Services LLC's commitments, it is our intention to purchase material, equipment, or work in accordance with the Contract. It is understood and agreed that material, equipment, or work will be provided in accordance with this Contract.

All invoices for material, equipment, or work for [AFFILIATE] shall be addressed as follows:

Affiliate Name

Attn:

Address:

Sincerely, [AFFILIATE]

By \_\_\_\_\_

Printed \_\_\_\_\_

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

Date: \_\_\_\_\_



**Exhibit G**  
**UNCONDITIONAL WAIVER AND RELEASE ON FINAL PAYMENT**  
*(Civil Code §8138, Operative July 1, 2012)*

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

**Identifying Information**

Name of Claimant: \_\_\_\_\_  
Name of Customer: \_\_\_\_\_  
Job Location: \_\_\_\_\_  
Owner: \_\_\_\_\_

**Unconditional Waiver and Release**

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

**Exceptions**

This document does not affect the following:  
Disputed claims for extras in the amount of: \$ \_\_\_\_\_

**Signature**

Claimant's Signature: \_\_\_\_\_  
Claimant's Title: \_\_\_\_\_  
Date of Signature: \_\_\_\_\_

# Appendix 1

## to Professional Services Contract

### Special Conditions Applicable to PacifiCorp CIPS Covered Assets and Critical Infrastructure Information NERC CIPS Requirements

NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION (NERC)  
CRITICAL INFRASTRUCTURE PROTECTION STANDARDS (CIPS)

Capitalized terms used herein shall have the same meaning as set forth in the Contract, unless the context may otherwise require.

#### Defined Terms:

The terms used in these Special Conditions applicable to PacifiCorp shall have the following meaning:

**Company's Criteria** shall mean applicable requirements used as the baseline for determining whether an individual is a restricted person, as set forth on Schedule 1, "Background Check Criteria."

**Company's Facilities** shall mean any facilities owned, operated or otherwise controlled by Company, which require Company authorization to obtain access.

**Critical Infrastructure Information** shall mean information concerning CIPS Covered Assets that: (i) relates to the production, generation or transmission of energy; (ii) could be useful to a person planning an attack on critical infrastructure; and (iii) provides strategic information beyond the geographic location of the critical asset, and which is identified as Critical infrastructure Information by Company.

**Sensitive Personnel** shall mean all Personnel with authorized unescorted physical access or authorized cyber access to Company's CIPS Covered Assets.

**Unescorted Personnel** shall mean all Personnel with authorized unescorted physical access to Company's Facilities.

#### SECTION 1: ACCESS TO COMPANY'S FACILITIES

##### 1.1 Requirements for Unescorted Personnel and Sensitive Personnel

Company shall specify in the Scope of Work whether or not the Work or Services under this Contract requires: (i) authorized unescorted physical access to Company's Facilities (*i.e.*, use of Unescorted Personnel); or (ii) authorized unescorted physical access or authorized cyber access to Company's CIPS Covered Assets (*i.e.*, use of Sensitive Personnel). For all Personnel who require such access, Consultant shall:

(a) Ensure that Unescorted Personnel and Sensitive Personnel have passed the background checks outlined in subsection 1.3(a) consistent with the Company's Background Check Criteria set forth on Schedule 1 prior to requesting unescorted physical access and/or cyber access to Company's Facilities and/or CIPS Covered Assets, as applicable;

(b) Ensure that Unescorted Personnel and Sensitive Personnel complete Company provided or approved initial CIPS compliance training prior to requesting unescorted physical access and/or cyber access to Company's Facilities and/or CIPS Covered Assets, as applicable;

(c) Ensure that Unescorted Personnel and Sensitive Personnel have passed Consultant's drug and alcohol exam and are in compliance with Consultant's substance abuse/drug and alcohol policy as outlined in Section 2; and

(d) Keep accurate and detailed documentation to confirm completion dates for background checks, all CIPS compliance training (initial and annual training, to the extent applicable), and drug tests, and certify to Company such documentation by completing a Contractor/Vendor Information Form, attached as Schedule 2 hereto, for each Unescorted Personnel or Sensitive Personnel.

Consultant shall not allow any Unescorted Personnel or Sensitive Personnel who have not met the foregoing requirements of this subsection 1.1 to perform Work or Services, unless Consultant has received prior written consent from Company.

### **1.2 Additional Access Requirements Specific to Sensitive Personnel**

In addition to the access requirements outlined in subsection 1.1, with respect to all Sensitive Personnel, Consultant also shall:

(a) Ensure that Sensitive Personnel (and any Personnel with access to Critical Infrastructure Information) are informed of and comply with Company's Critical Infrastructure Information requirements contained in the Contract, including the additional requirements applicable to Critical Infrastructure Information set forth in Section 4 herein, and any confidentiality agreement previously executed by Consultant, if applicable;

(b) In addition to the initial CIPS compliance training requirement outlined in subsection 1.1(b), ensure that Sensitive Personnel complete Company provided or approved CIPS compliance training within Company's prescribed training window, and not less than on an annual basis; and

(c) Immediately report both (i) Sensitive Personnel terminations for cause and (ii) all other Sensitive Personnel terminations or changes in employment status for those who no longer require access, to the Company's Technology Resource Center (TRC). The TRC is available by calling either (503) 813-5555 or (801) 220-5555.

Consultant shall not allow any Sensitive Personnel who have not met the foregoing requirements of this subsection 1.2 to perform Work or Services, unless Consultant has received prior written consent from Company.

### **1.3 Personnel Screening/Background Check Requirements for Unescorted Personnel and Sensitive Personnel**

For all Unescorted Personnel or Sensitive Personnel, the following requirements must be met by Consultant:

(a) Consultant shall conduct, at Consultant's cost and expense, the requisite background checks for the current and past countries of residence of all Unescorted Personnel and Sensitive Personnel consistent with the Company's Background Check Criteria set forth on Schedule 1. All background checks will be conducted in accordance with federal, state, provincial, and local laws, and subject to existing collective bargaining unit agreements or other agreements, if any.

(b) Following the initial background check to obtain authorization for access, the background checks shall be updated no less frequently than every seven (7) years or upon request by Company, and shall, at a minimum, consist of a social security number identity verification and seven (7) year criminal background check, including all convictions for a crime punishable by imprisonment for a term exceeding one (1) year.

(c) Consultant shall ensure that each of the Unescorted Personnel and Sensitive Personnel sign an appropriate authorization form prior to background checks being conducted, acknowledging that the background check is being conducted, and authorizing the information obtained to be provided to Company.

(d) Company has the right to audit Consultant's records supporting each Contractor/Vendor Information Form, attached as Schedule 2, submitted to Company, including background check results, and to verify that the requisite background checks and drug tests were

performed consistent with Company's Background Check Criteria set forth on Schedule 1. Consultant shall provide Company with all requested records supporting Contractor/Vendor Information Forms within a reasonable time after receiving such request, and in the form requested by Company, but not longer than three (3) business days following the date of such request.

(e) For purposes of this Contract, a background check is considered valid pursuant to the Company's Background Check Criteria, set forth on Schedule 1, if it was completed within two (2) years prior to the date on which the Consultant signed a Contractor/Vendor Information Form for each Unescorted Personnel and Sensitive Personnel. Regardless of when performed, all background checks shall be documented pursuant to the requirements set forth in this subsection 1.3.

(f) In the event Company notifies Consultant of the impending expiration of the background check of any Unescorted Personnel or Sensitive Personnel, Consultant shall provide an updated Contractor/Vendor Information Form reflecting a refreshed background check within twenty (20) days of receipt of the notice, in order to avoid revocation of such person's access.

#### **1.4 Consultant Designee**

Consultant shall designate one person to be responsible for compliance with the requirements of this Section 1 and all reporting and inquiries (other than Sensitive Personnel terminations or changes in employment status) shall be made via e-mail to [CIPS-Contracting@PacifiCorp.com](mailto:CIPS-Contracting@PacifiCorp.com). Sensitive Personnel terminations or changes in employment status should be reported to the TRC pursuant to subsection 1.2(c).

### **SECTION 3: ADDITIONAL REQUIREMENTS APPLICABLE TO CRITICAL INFRASTRUCTURE INFORMATION**

Confidential Information of Company labeled as Critical Infrastructure Information shall be protected consistent with the following requirements: (a) Critical Infrastructure Information shall be protected at all times, either by appropriate storage or having it under the personal observation and control of a person authorized to receive it; (b) each person who works with protected Critical Infrastructure Information is personally responsible for taking proper precautions to ensure that unauthorized persons do not gain access to it; (c) reasonable steps shall be taken to minimize the risks of access to Critical Infrastructure Information by unauthorized personnel (when not in use, Critical Infrastructure Information shall be secured in a secure container, such as a locked desk, file cabinet or facility where security is provided); (d) documents or material containing Critical Infrastructure Information may be reproduced to the minimum extent necessary, consistent with the need to carry out the Work or Services, provided that the reproduced material is marked and protected in the same manner as the original material; (e) material containing Critical Infrastructure Information should be disposed of through secured shredding receptacles or other secured document destruction methods; (f) Critical Infrastructure Information shall be transmitted only by the following means: (i) hand delivery; (ii) United States first class, express, certified or registered mail, bonded courier, or through secure electronic means; (iii) e-mail with encrypted file (such as, WinZip with password) (the password should not be included in e-mail, but should be delivered by phone or in an unrelated e-mail not mentioning the document name; password-protected Microsoft Office documents do not meet the encryption requirements); and (g) documents or material containing Critical Infrastructure Information shall be returned to Company or certified destroyed upon completion of the Work or Services.

# Schedule 1

## Special Conditions Applicable to PacifiCorp Background Check Criteria

Company has a policy, “Badge and Access Standards,” which outlines Company standards, procedures, compliance policies and workforce responsibilities regarding badges and access to all PacifiCorp controlled areas. Access to Company’s Facilities is subject to this policy and requires access to be granted on an as-needed basis after completion of the required background check and training requirements.

In addition, the Company is required to comply with the mandatory Critical Infrastructure Protection Standards (CIPS) issued by the North American Electric Reliability Corporation (NERC) and approved by the Federal Energy Regulatory Commission on January 17, 2008. The CIPS were adopted to ensure that electric utilities, as part of the nation’s critical infrastructure, are able to sustain and secure against vulnerabilities that may threaten the electric system and the utilities that operate it. Specifically, Standards CIP-001 through CIP-009 provide a cyber security framework for the identification and protection of assets critical to the reliable operation of the bulk electric system (*i.e.*, CIPS Covered Assets).

In order to ensure compliance with CIPS and the Company’s access policy, Company requires that all Personnel who will have authorized unescorted physical access to Company’s Facilities (*i.e.*, Unescorted Personnel) and/or authorized unescorted physical access or authorized cyber access to CIPS Covered Assets (including control centers, substations, generation plants, critical cyber assets, etc.) (*i.e.*, Sensitive Personnel) have the appropriate security clearance and security training. A background check of Consultant’s Unescorted Personnel or Sensitive Personnel will be considered valid pursuant to these Criteria if it was completed within two (2) years prior to the date the Consultant signed a Contractor/Vendor Information Form for each such person.

Individuals who are considered “restricted persons” may not have unescorted access to Company’s Facilities or CIPS Covered Assets. An individual will be considered a “restricted person” if the person meets any of the following criteria:

- Is currently under indictment for a crime punishable by imprisonment for a term exceeding one (1) year;
- Has been convicted (within the past seven (7) years) in any court of a crime punishable by imprisonment for a term exceeding one (1) year;
- Is currently a fugitive from justice; or
- Is an alien illegally or unlawfully in the United States.

If an individual’s background check indicates that he/she meets any of the above criteria, the individual will be considered a “restricted person” and unescorted access to Company’s Facilities or CIPS Covered Assets will not be authorized.

**End of Schedule 1**

## Schedule 2

### Special Conditions Applicable to PacifiCorp

### Contractor / Vendor Information Form (CIF)

#### **Contractor / Vendor Information**

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

Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Contractor / Vendor Name: \_\_\_\_\_  
*(Include middle initial, if applicable: First, Middle, Last)*

(1) Successfully Passed Employer's Drug and Alcohol Exam? Yes \_\_\_\_\_ No \_\_\_\_\_

Date Completed: \_\_\_\_\_  
*(Yes – mm/dd/yyyy)*

(2) Successfully Passed Employer's Background Check? Yes \_\_\_\_\_ No \_\_\_\_\_

Date Completed: \_\_\_\_\_  
*(Yes – mm/dd/yyyy)*

(3) Successfully Completed PacifiCorp's Security trainings? Yes \_\_\_\_\_ No \_\_\_\_\_

Date Completed: \_\_\_\_\_  
*(Yes – mm/dd/yyyy)*

*I hereby certify that the information provided regarding the Contractor / Vendor is accurate and documentation to support this information will be retained by Contractor / Vendor employer and provided upon Company's request*

\_\_\_\_\_  
*Manager Signature of Contractor / Vendor Employer*

\_\_\_\_\_  
*Date*

#### **PacifiCorp Approvals**

\_\_\_\_\_  
*Signature of PacifiCorp Hiring Manager*

\_\_\_\_\_  
*Date*

\_\_\_\_\_  
*Printed Name of PacifiCorp Hiring Manager*

If Contractor / Vendor did not pass the Background Check or Drug and Alcohol Exam, but an exception is requested provide reason for exception:

\_\_\_\_\_  
\_\_\_\_\_

*Accepted by PacifiCorp Chief Compliance Officer*

*Date*

Contractor / Vendor will not be permitted access to Company controlled areas without the completion of Drug/Alcohol, Background verifications and completion of security training. Send the completed form electronically to Corporate Physical Security at “\_Access Administrators” (accessadmins@pacificorp.com) for ID badge issuance. The form may be attached to a request for physical access.

**End of Schedule 2**

## **Appendix 2 to Professional Services Contract**

### **Special Conditions Applicable to MidAmerican Energy Company CIPS Covered Assets and Protected Information NERC CIPS Requirements**

#### **NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION (NERC) CRITICAL INFRASTRUCTURE PROTECTION (CIP) STANDARDS**

Capitalized terms used herein shall have the same meaning as set forth in the Contract, unless the context may otherwise require.

#### **1. PERSONNEL RISK ASSESSMENTS, TRAINING, SECURITY AWARENESS, INFORMATION PROTECTION, PERSONNEL CHANGES AND DOCUMENTATION**

Consultant and all Personnel employed by or otherwise engaged by Consultant with authorized cyber or authorized unescorted physical access to Company's (hereinafter also referred to as "MidAmerican") CIPS Covered Assets and/or Protected Information, shall comply with (a) all requirements of the NERC CIP standards, including and not limited to (b) MidAmerican's Personnel Risk Assessment Program, Training Program, Security Awareness Program, and Information Protection Program, incorporated herein by this reference, or Consultant's programs for personnel risk assessment, training, security awareness and information protection, if MidAmerican has reviewed and verified and approved the same.

In conjunction with the NERC CIP standards, Consultant shall ensure NERC CIP compliance and communicate all requirements to Personnel. Consultant shall (a) conduct personnel risk assessments consisting of an identity verification (at a minimum social security verification of U.S. citizens) and seven (7) year criminal background check and provide written certification as specified in Section 2 of these Special Conditions for all Personnel (except if access is only to non-public CIP sensitivity classification Protected Information); (b) fully inform and train all Personnel on requirements of CIP standards prior to accessing CIPS Covered Assets and/or Protected Information and shall quarterly reinforce security awareness. If Consultant feels any of MidAmerican's training or security awareness materials are inappropriate or desires to use Consultant's training or security awareness materials, Consultant shall provide Notice to MidAmerican, and provide the training and/or security awareness documents and any improved practice to MidAmerican for review, verification and approval; (c) furnish MidAmerican a list that shows by name of Personnel, the completion date of each training course, and what materials were utilized; (d) furnish MidAmerican a list describing the security awareness materials used and dates and how the security materials were distributed; (e) provide MidAmerican with a list of Personnel authorized to handle MidAmerican's protected CIP information that shows Personnel's information sensitivity classification clearance level and assure Personnel adhere to Protected Information handling procedures; (f) report Personnel terminations for cause immediately to MidAmerican but not longer than twelve (12) hours from time of termination and report all other Personnel terminations or changes in employment status for those who no longer require access within twelve (12) hours from time of occurrence; and (g) keep accurate and detailed documentation to confirm compliance with requirements of NERC CIP standards as specified in Section 3 of these Special Conditions.



Consultant shall designate one person to be responsible for compliance with the Contract requirements. Reporting relating to this section shall be to MidAmerican's designated authorized representative.

In case of conflict or inconsistency between MidAmerican's programs and requirements of the NERC CIP standards, the NERC CIP requirements shall govern.

## **2. CRIMINAL BACKGROUND CHECK, IDENTITY VERIFICATION AND RELATED SCREENING**

If requested by MidAmerican, Consultant shall conduct, at its sole cost and expense, criminal background checks for the current and past counties of residence on all Personnel that have cyber or unescorted physical access to MidAmerican facilities or North American Electric Reliability Corporation CIPS Covered Assets or Protected Information. The background checks shall be updated no less frequently than every seven (7) years or for cause. At a minimum, an identity verification (social security number verification for U.S. citizens) and seven (7) year criminal background check including felony or misdemeanor convictions involving: (a) violence to persons/property; (b) theft/fraud; (c) drug/alcohol; or (d) traffic/other are required, employment history, education verification and professional certifications may also be required by MidAmerican. All background checks will be conducted in accordance with federal, state, provincial, and local laws, and subject to existing collective bargaining unit agreements or other agreements, if any. Consultant shall not allow persons who have not met MidAmerican's criteria to perform Work or Services or access CIPS Covered Assets or Protected Information, unless Consultant has received written authorization from MidAmerican. Consultant shall supply a certification that meets MidAmerican's criteria for all Personnel employed or engaged by Consultant. Consultant shall ensure that all Personnel sign an appropriate authorization form prior to criminal background checks being conducted, acknowledging the background check is being conducted and authorizing the information obtained to be provided to MidAmerican.

It is understood and agreed that MidAmerican may review Consultant's policies, background checks and related documentation upon request, subject to applicable federal, state and/or local statutes or regulations. MidAmerican may also request that Consultant provide an ongoing and updated list of persons that have been denied authorization to perform Work or Services for MidAmerican or denied access to MidAmerican assets, information or facilities.

## **3. AUDIT**

Consultant shall keep such full and detailed documentation as may be necessary for substantiation of compliance with this Contract. The method for maintaining documentation shall be satisfactory to MidAmerican. MidAmerican or its designee shall be afforded access to, and allowed to make copies of all Consultant's records, books, correspondence, instructions, drawings, agreements, memoranda and similar data that, in MidAmerican's judgment, relate to this Contract. This documentation will be available at Consultant's regular place of business during normal working hours or provided to MidAmerican in a reasonable alternative manner as may be requested by MidAmerican. Consultant shall preserve all such documentation for a period of three (3) years after completion of the Work or Services or longer where required by law. These requirements shall also apply to all Personnel, of any tier, and to all companies that are wholly or partially owned by or are affiliated with Consultant.

**End of Appendix 2**

## **Appendix 3**

### **to Professional Services Contract**

#### **Special Conditions**

#### **Applicable to NV Energy**

#### **CIPS Covered Assets and Protected Information**

#### **NERC CIPS Requirements**

##### NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION (NERC) CRITICAL INFRASTRUCTURE PROTECTION (CIP) STANDARDS

Capitalized terms used herein shall have the same meaning as set forth in the Contract, unless the context may otherwise require.

#### **1. PERSONNEL RISK ASSESSMENTS, TRAINING, SECURITY AWARENESS, INFORMATION PROTECTION, PERSONNEL CHANGES AND DOCUMENTATION**

Consultant and all Personnel employed by or otherwise engaged by Consultant with authorized cyber or authorized unescorted physical access to Company's (hereinafter also referred to as "NV Energy") CIPS Covered Assets and/or Protected Information, shall comply with (a) all requirements of the NERC CIP standards, including and not limited to (b) NV Energy's Personnel Risk Assessment review and NERC/CIP Training Program, incorporated herein by this reference, or Consultant's programs for personnel risk assessment, training, security awareness and information protection, if NV Energy has reviewed and verified and approved the same.

In conjunction with the NERC CIP standards, Consultant shall ensure NERC CIP compliance and communicate all requirements to Personnel. Consultant shall (a) conduct personnel risk assessments consisting of an identity verification (at a minimum social security verification of U.S. citizens) and seven (7) year criminal background check and provide written certification as specified in Section 2 of these Special Conditions for all Personnel (except if access is only to non-public CIP sensitivity classification Protected Information); (b) fully inform and train all Personnel on requirements of CIP standards prior to accessing CIP Covered Assets and/or Protected Information and shall quarterly reinforce security awareness. If Consultant feels any of NV Energy's training or security awareness materials are inappropriate or desires to use Consultant's training or security awareness materials, Consultant shall provide Notice to NV Energy, and provide the training and/or security awareness documents and any improved practice to NV Energy for review, verification and approval; (c) furnish NV Energy a list that shows by name of Personnel, the completion date of each training course, and what materials were utilized; (d) furnish NV Energy a list describing the security awareness materials used and dates and how the security materials were distributed; (e) provide NV Energy with a list of Personnel authorized to handle NV Energy's protected CIP information that shows Personnel's information sensitivity classification clearance level and assure Personnel adhere to Protected Information handling procedures; (f) report Personnel terminations for cause immediately to NV Energy but not longer than twelve (12) hours from time of termination and report all other Personnel terminations or changes in employment status for those who no longer require access within twelve (12) hours from time of occurrence; and (g) keep accurate and detailed documentation to confirm compliance with requirements of NERC CIP standards as specified in Section 3 of these Special Conditions.

Consultant shall designate one person to be responsible for compliance with the Contract requirements. Reporting relating to this section shall be to NV Energy's designated authorized representative.

In case of conflict or inconsistency between NV Energy's programs and requirements of the NERC CIP standards, the NERC CIP requirements shall govern.

## **2. CRIMINAL BACKGROUND CHECK, IDENTITY VERIFICATION AND RELATED SCREENING**

If requested by NV Energy, Consultant shall conduct, at its sole cost and expense, criminal background checks for the current and past counties of residence on all Personnel that have cyber or unescorted physical access to NV Energy facilities or North American Electric Reliability Corporation CIP Covered Assets or Protected Information. The background checks shall be updated for cause but no less frequently than every seven (7) years or for cause. At a minimum, an identity verification (social security number verification for U.S. citizens) and seven (7) year criminal background check including felony or misdemeanor convictions involving: (a) violence to persons/property; (b) theft/fraud; (c) drug/alcohol; or (d) traffic/other are required, employment history, education verification and professional certifications may also be required by NV Energy. All background checks will be conducted in accordance with federal, state, provincial, and local laws, and subject to existing collective bargaining unit agreements or other agreements, if any. Consultant shall not allow persons who have not met NV Energy's criteria to perform Work or Services or access CIPS Covered Assets or Protected Information, unless Consultant has received written authorization from NV Energy. Consultant shall supply a certification that meets NV Energy's criteria for all Personnel employed or engaged by Consultant. Consultant shall ensure that all Personnel sign an appropriate authorization form prior to criminal background checks being conducted, acknowledging the background check is being conducted and authorizing the information obtained to be provided to NV Energy.

It is understood and agreed that NV Energy may review Consultant's policies, background checks and related documentation upon request, subject to applicable federal, state and/or local statutes or regulations. NV Energy may also request that Consultant provide an ongoing and updated list of persons that have been denied authorization to perform Work or Services for NV Energy or denied access to NV Energy assets, information or facilities.

## **3. AUDIT**

Consultant shall keep such full and detailed documentation as may be necessary for substantiation of compliance with this Contract. The method for maintaining documentation shall be satisfactory to NV Energy. NV Energy or its designee shall be afforded access to, and allowed to make copies of all Consultant's records, books, correspondence, instructions, drawings, agreements, memoranda and similar data that, in NV Energy's judgment, relate to this Contract. This documentation will be available at Consultant's regular place of business during normal working hours or provided to NV Energy in a reasonable alternative manner as may be requested by NV Energy. Consultant shall preserve all such documentation for a period of four (4) years after completion of the Work or Services or longer where required by law. These requirements shall also apply to all Personnel, of any tier, and to all companies that are wholly or partially owned by or are affiliated with Consultant.

**End of Appendix 3**

**WASHINGTON AFFILIATED INTEREST FILING**

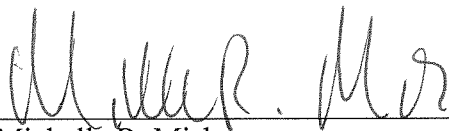
**VERIFICATION**

**VERIFICATION**

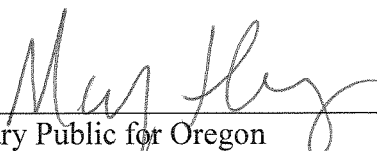
I, Michelle R. Mishoe, am Senior Counsel for Pacific Power & Light Company and am authorized to make this verification on its behalf. Based on my personal knowledge about the attached Master General Services Agreement between Berkshire Hathaway Energy Company and Metalogic Inspection Services for Boiler, High Energy Piping, Unfired Pressure Vessel, Non-destructive Inspection and Evaluation Services, I verify that the Master General Services Agreement between Berkshire Hathaway Energy Company and Metalogic Inspection Services for Boiler, High Energy Piping, Unfired Pressure Vessel, Non-destructive Inspection and Evaluation Services is a true and accurate copy of the original.

I declare upon the penalty of perjury, that the foregoing is true and correct.

Executed on August 20, 2014 at Portland, Oregon.

  
\_\_\_\_\_  
Michelle R. Mishoe  
Senior Counsel  
Pacific Power

Subscribed and sworn to me on this 20 day of August, 2014.

  
\_\_\_\_\_  
Notary Public for Oregon

My Commission expires: May 17, 2015

