

**Project Number:** STIN-0161  
**Project Title:** Creep-Fatigue Flaw Growth Analysis to Support Elevated Temperature Flaw Size Acceptance Criteria  
**Solicitation Date:** 01 November 2018  
**Proposal Due Date:** 30 November 2018

## 1 Summary

ASME Standards Technology, LLC (ASME ST-LLC) is soliciting proposals for the referenced project. The project results will be used in developing rational flaw acceptance criteria for equipment operating in the creep regime and is a logical extension to the current ASME Boiler and Pressure Vessel Code (BPVC) Section I, Code Case 2235 for using ultrasonic test methods in lieu of radiography, and directly supports ASME BPVC Section I modernization.

This Request-for-Proposal (“RFP”) and all open RFPs are posted on the ASME ST-LLC webpage: ([http://asmestllc.org/ST-LLC\\_RequestsProposals.html](http://asmestllc.org/ST-LLC_RequestsProposals.html))

## 2 Background

There has been a growing momentum to evaluate ASME BPVC Section I in areas that may require modernization. Several years ago Stuart Cameron prepared a paper titled “Review of ASME Section I – Rules for Construction of Power Boilers in Comparison with other International Standards for Power Boilers;” this paper reviewed the structure and content of ASME BPVC Section I and compared it to European Standard (EN) 12952, which is the most recent boiler standard to be issued by standardizing bodies worldwide. EN 12952 considers recent technological advances in plant design to accommodate operation at greater temperatures.

ASME’s Board of Pressure Technology Codes and Standards (BPTCS) appointed a Task Group to address new and improved materials for successful use in applications at elevated temperatures in the ultra-supercritical power plant steam cycle, because ASME BPVC Section I rules for design, materials, and fabrication can be used in undesirable ways respecting component service life, particularly when creep strength enhanced ferritic steels are used.

Manufacturers, operators, regulators, and insurance companies are likely to see the benefits of the proposed referenced project because the project should result in a more economic design and a more robust design, and will affect the in-service inspection rules with the possibility of limiting periods between statutory inspections.

### 3 Scope of Work

The Independent Consultant may complete the entire Scope of Work in-house or subcontract portions of the Scope of Work. If any portion of the Scope of Work is to be subcontracted by the Independent Consultant, the Independent Consultant shall be responsible for managing all subcontractors.

#### 3.1 Summary

The scope of this project is to analyze a matrix of typical elevated temperature components using recognized creep-fatigue flaw growth analysis methods and data. The key deliverable will be the largest initial flaw size for each case that satisfies the specified transient operating conditions: temperature, pressure, time, and cycles. The transient operating conditions that shall be considered are provided in Attachment 1 of this request for proposal. Conditions (including the inputs given in Attachment 1) are intended to be representative of a typical ultra-supercritical (USC) power plant. Each transient has been normalized for each case such that it can be used for each of the defined assessment cases by multiplying by the design pressure/temperature given in Attachment 3.

Specified Inputs:

1. Operating Duration: 200,000 hours (22.8 years)
2. Operating Conditions (transient conditions provided in Attachment 1):
  - a. Number of Cold Starts (> 48 hours shutdown) = 100
  - b. Number of Warm Starts (8 to 48 hours shutdown) = 1,000
  - c. Number of Hot Starts (<8 hours shutdown) = 6,000
3. Stresses
  - a. Pressure-induced
  - b. Welding residual equal to 35% of average 0.2% yield strength
  - c. Thermal

Analysis Requirements:

1. Analysis Methods<sup>1</sup>
  - a. American Petroleum Institute (API) 579-1/ASME Fitness-for-Service (FFS)-1, Part 10 (including Annex F material models and data)
  - b. Electricite de France (EDF) Recommended Procedure R5 V4/5 (including R66 material models and data)
  - c. Electric Power Research Institute (EPRI) Boiler Life Evaluation and Simulation System (BLESS) code (including embedded material models and data)
2. Configuration: Girth Weld
3. Components: 1 each
  - a. Superheater tube
  - b. Reheater tube

---

<sup>1</sup> To be proposed individually for a possible maximum of three (3) proposals or one (1) per method.

- c. Superheater pipe
- d. Reheater pipe
- 4. Materials:
  - a. Grade 22
  - b. Grade 91
  - c. Type 304H (for analysis methods (a) and (b) only – see Attachment 2)

Attachment 2 gives the matrix of basic cases to be analyzed for each method: ten (10) cases for methods (a) and (b) and eight (8) cases for method (c). For each of these cases the following flaw cases will be run:

- 1. Flaw Orientations:
  - a. Circumferential
  - b. Longitudinal
- 2. Flaw Locations:
  - a. Inside surface
  - b. Outside surface
  - c. Mid-wall (subsurface)
- 3. Flaw Geometries:
  - a. Infinite length/full circumferential
  - b. 6:1 (2c vs. a) semi-elliptical

Thus, for each component model, there are two (2) flaw orientations by three (3) flaw locations by two (2) flaw sizes, which results in 120 flaw analysis cases ( $10 \times 2 \times 3 \times 2$ ) for analysis method (a) and (b) and 96 flaw analysis cases ( $8 \times 2 \times 3 \times 2$ ) for analysis method (c) .

The output from the analysis of each of the flaw case is to be the largest permitted starting flaw, and the results of each analysis must be documented in a formal technical report. Acceptance criteria should be consistent with the given analysis method. If no acceptance criteria are given, then failure shall be defined as either a flaw growing to 75% through-wall at its deepest point or gross rupture due to loss of section.

### **3.2 Deliverables**

The project deliverable shall be a comprehensive report providing data and results for three (3) analysis methods identified in Section 3.1 preceding. The Independent Consultant shall submit all data prior to comprehensive report submittal.

The comprehensive report shall be provided initially as a draft report or multiple draft reports and subsequently as a final report that incorporates the comments of ASME ST-LLC or applicable ASME review committees, such as an ASME Peer Review Group (PRG). One peer review cycle is anticipated and modifications required to the draft, as a result of the review cycle, are the responsibility of the respondent awarded the contract.

All written deliverables shall be provided as an MS Word file that is formatted in accordance with the ASME Style Guide.



### **3.3 Schedule**

The Independent Consultant shall complete the Scope of Work and provide the final deliverable within twelve (12) months of contract execution.

### **3.4 Progress Reporting**

The Independent Consultant shall provide a brief status report on a monthly basis, via email, to the ASME ST-LLC project manager identified herein. The initial status report shall be provided within 30 days of contract execution date. The status report shall identify activities underway, planned and completed, and shall also identify any anticipated delays to the project schedule.

## 4 Respondent Eligibility Requirements

ASME ST-LLC is seeking proposals from all qualified organizations including, but not limited to, engineering firms, independent consultants, academic institutions, and federally funded research and development centers. In addition to relevant technical qualifications and experience, respondents must possess an understanding of relevant ASME codes and standards.

Contractor must have access to pre-existing analysis tools that automate the required creep-fatigue crack growth procedures that they are proposing for.

## 5 Basis for Selection and Award

ASME ST-LLC will select a winning proposals for each of the three methods by evaluating and comparing the merits of each respondent's complete proposal<sup>2</sup>. This process reflects ASME ST-LLC's desire to select a proposal based on its potential to achieve program objectives, rather than solely on evaluated technical merit or cost. Evaluation criteria include, but are not limited to, the following:

- Respondent's technical capabilities, including that of all subcontractors.
- Respondent's applicable experience, including that of all subcontractors.
- Proposal price.
- Project schedule.
- Any exceptions to ASME ST-LLC's standard agreement.

ASME ST-LLC reserves the right to award, in whole or in part, any, all, or none of the proposals/respondents answering this solicitation.

## 6 Contract Terms and Conditions

The contract to perform the Scope of Work shall be fixed price. A form of ASME ST-LLC's standard agreement applicable to this Scope of Work is attached as Attachment 4 to this RFP.

ASME ST-LLC will provide access to applicable codes, standards, and other technical references as needed to perform the Scope of Work.

---

<sup>2</sup> There could be up to three contractors selected, one per method.

## **7 Submission Requirements**

### **7.1 Proposal Due Date**

Proposals must be submitted by 30 November 2018. Respondents are encouraged to transmit its proposal well before this deadline. Requests for extra time must be sent by 12 November 2018 to the contact listed in Section 8 of this RFP.

ASME ST-LLC intends to select the winning proposal within three weeks of the proposal deadline.

### **7.2 Proposal Preparation Costs**

Proposal costs shall be borne by the respondent. This solicitation does not obligate ASME ST-LLC to pay any costs incurred in the preparation and submission of the proposal, in making necessary studies or designs for the preparation thereof, or to acquire or contract for any services.

### **7.3 Proposal Clarification**

ASME ST-LLC reserves the right to request clarification of any proposal and supplemental information. Selection of the winning proposal may be made after few or no exchanges, discussions, or negotiations; therefore, all respondents are advised to submit its most favorable application to ASME ST-LLC. ASME ST-LLC reserves the right, without qualification, to reject any or all proposals received in response to this solicitation and to select any proposal, in whole or in part, as a basis for negotiation and award. ASME ST-LLC reserves the right to modify or cancel this solicitation. All questions relating to this solicitation must be submitted to the contact listed in Section 8 of this RFP. Any amendments to this solicitation will be posted at the ASME ST-LLC website previously referenced.

### **7.4 Treatment of Proprietary Information**

A proposal may include technical and other data, including trade secrets and privileged, confidential commercial, or financial information that the respondent does not want disclosed to the public or used by ASME ST-LLC for any purpose other than proposal evaluation. To protect such data, the respondent should specifically identify the data or information to be protected.

### **7.5 Proposal Preparation and Submittal Instructions**

ASME ST-LLC may form a committee of subject matter experts to evaluate the technical qualifications of respondents. To help facilitate this evaluation, proposals should be separated into two separate documents: (1) a Technical Proposal; and (2) a Financial Proposal.

#### **7.5.1 Technical Proposal contents must include:**

- Organization name and contact information.

- Evidence of technical capabilities: credentials, qualifications, capabilities, and experience of individuals and the organization.
- An approach to accomplish the Scope of Work (refer to Section 3).
- Demonstrate agreement with the Scope of Work (refer to Section 3).

7.5.2 Financial Proposal contents must include:

- A fixed-price quotation to complete the Scope of Work.
- Confirm agreement with the form of agreement attached herein or state any requested exceptions to same.

7.5.3 The respondent shall submit the Technical and Financial Proposals files via e-mail to the ASME ST-LLC contact identified in Section 8 of this RFP. Responses must be received on or before the proposal due date identified in Section 7.1 of this RFP.

## **8 ASME Standards Technology, LLC Contact Information**

All correspondence regarding this RFP is to be directed to the following person:

Ms. Selin Sahici, PMP  
Project Manager  
ASME Standards Technology, LLC  
Two Park Avenue  
New York, NY 10016  
Telephone: 212-591-7046  
E-mail: [sahicis@asme.org](mailto:sahicis@asme.org)

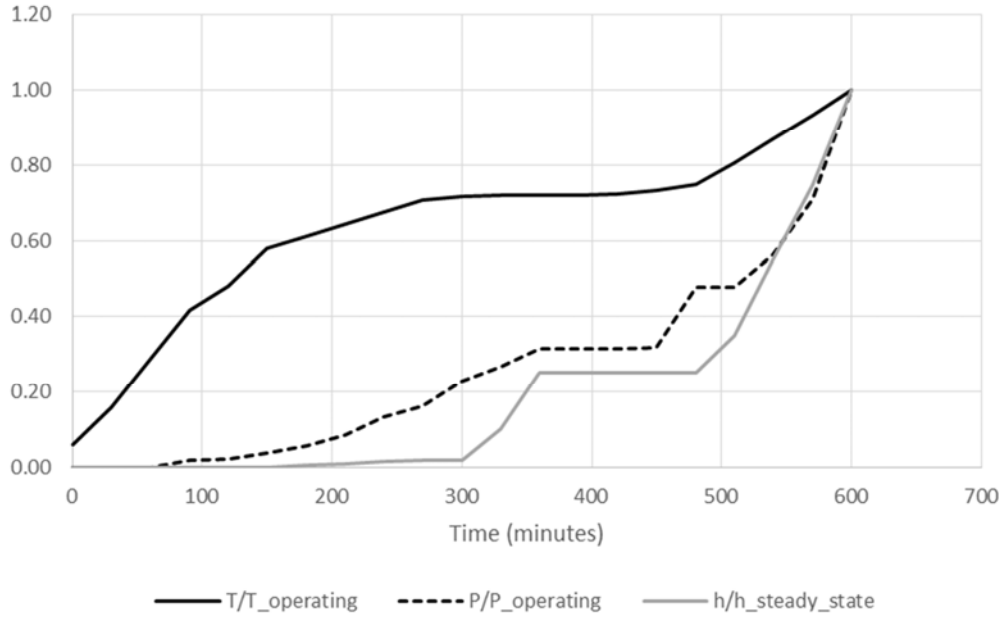


**ATTACHMENT 1: TRANSIENT OPERATING CONDITION DEFINITION FOR ANALYSIS**

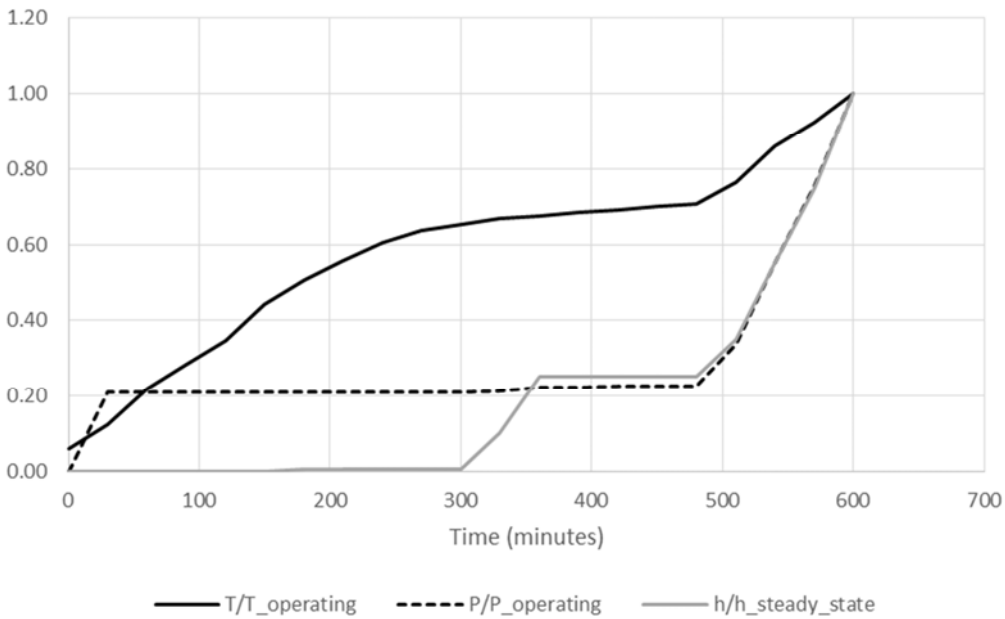




Normalized Transient Conditions for Superheater - Cold Start

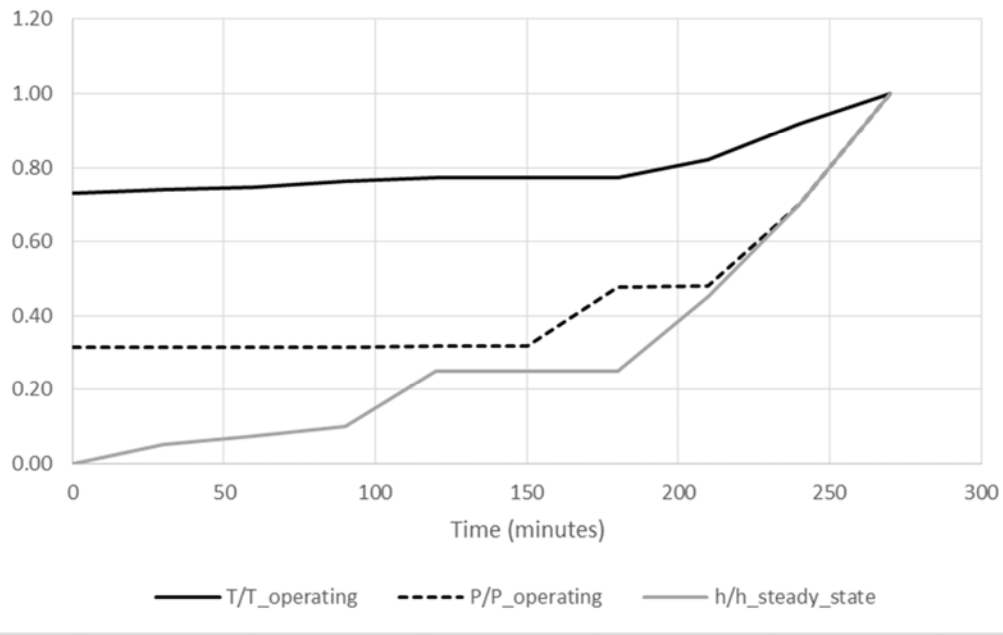


Normalized Transient Conditions for Reheater - Cold Start

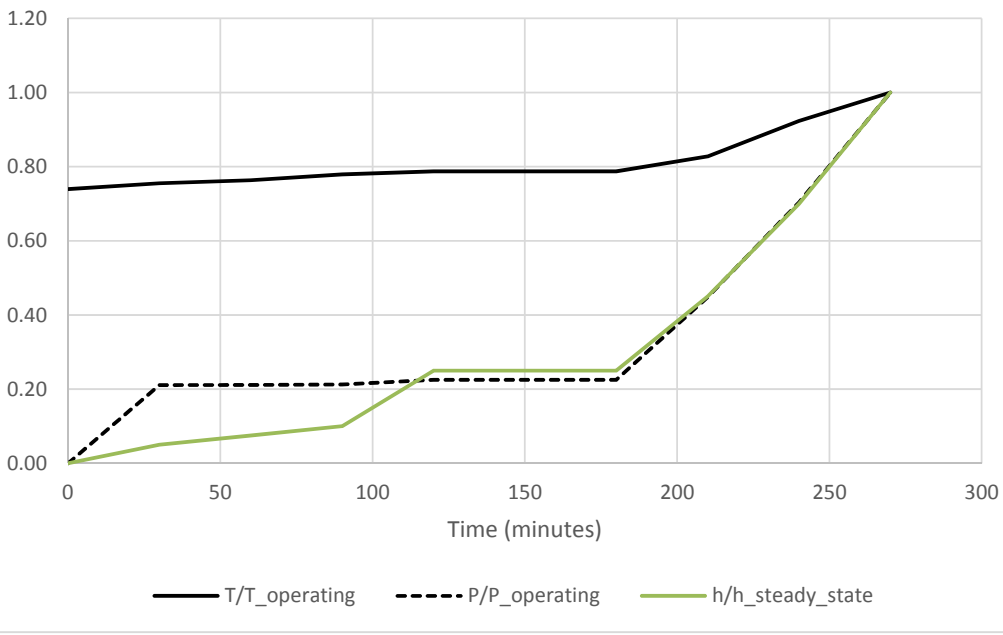




Normalized Transient Conditions for Superheater - Warm Start

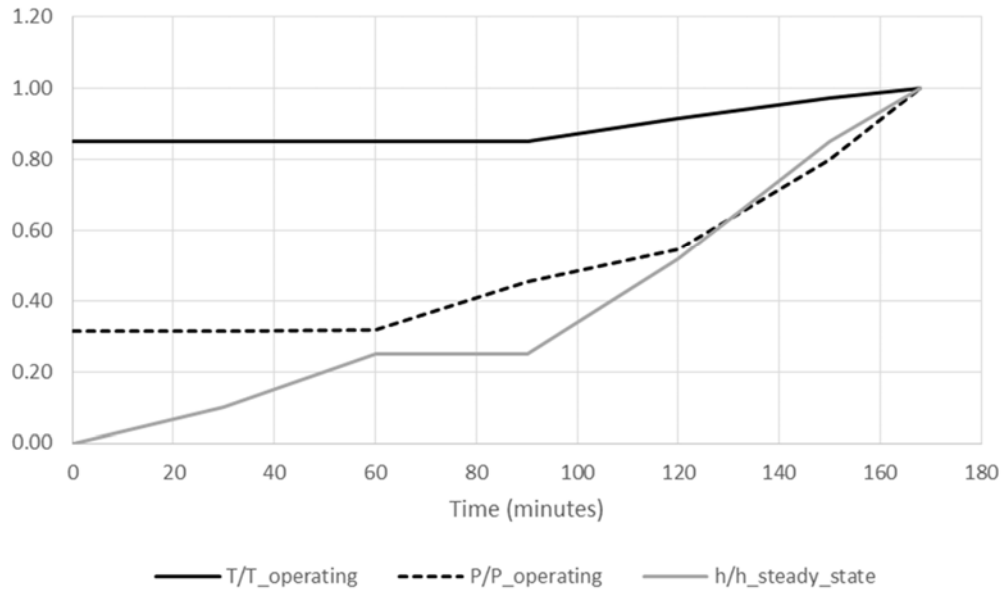


Normalized Transient Conditions for Reheater - Warm Start

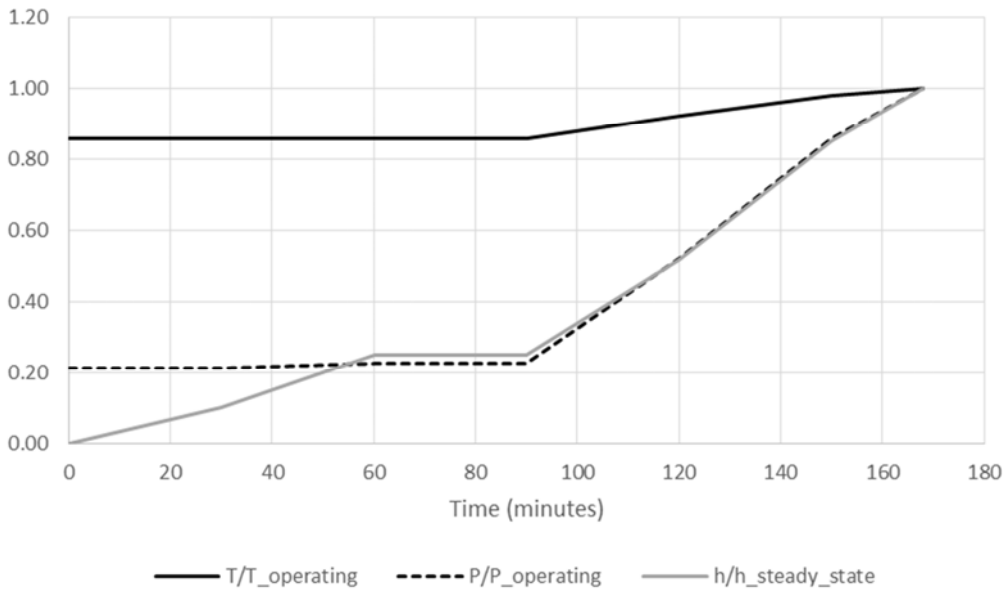


Hot Start (Normalized)						
Time (min.)	SH Temp	RH Temp	SH Flow	RH Flow	SH press	RH press
0	0.85	0.86	0.00	0.00	0.31	0.21
30	0.85	0.86	0.10	0.10	0.31	0.21
60	0.85	0.86	0.25	0.25	0.32	0.23
90	0.85	0.86	0.25	0.25	0.45	0.23
120	0.92	0.92	0.52	0.52	0.54	0.52
150	0.97	0.98	0.85	0.85	0.80	0.86
168	1.00	1.00	1.00	1.00	1.00	1.00

Normalized Transient Conditions for Superheater - Hot Start

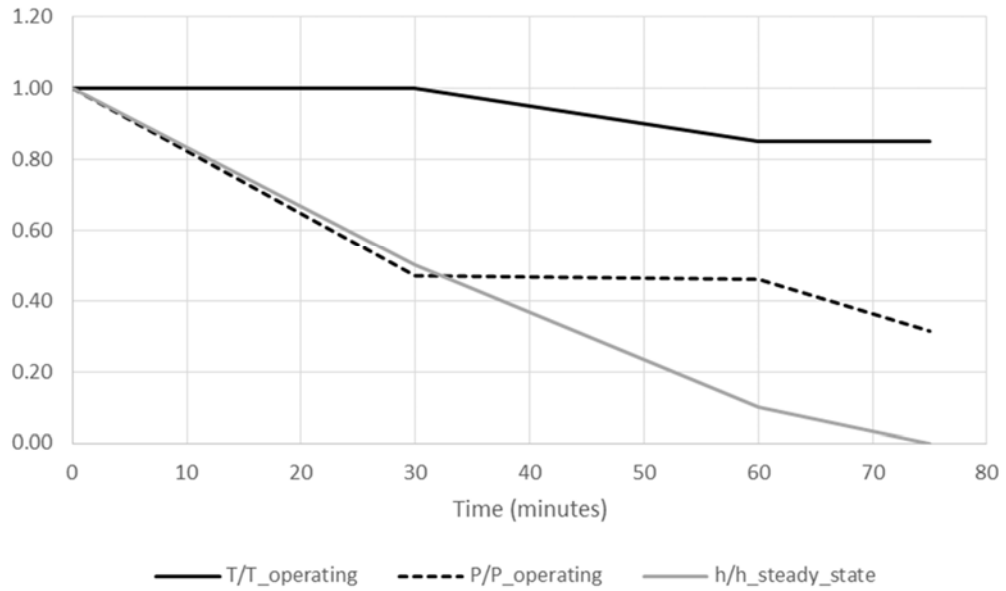


Normalized Transient Conditions for Reheater - Hot Start

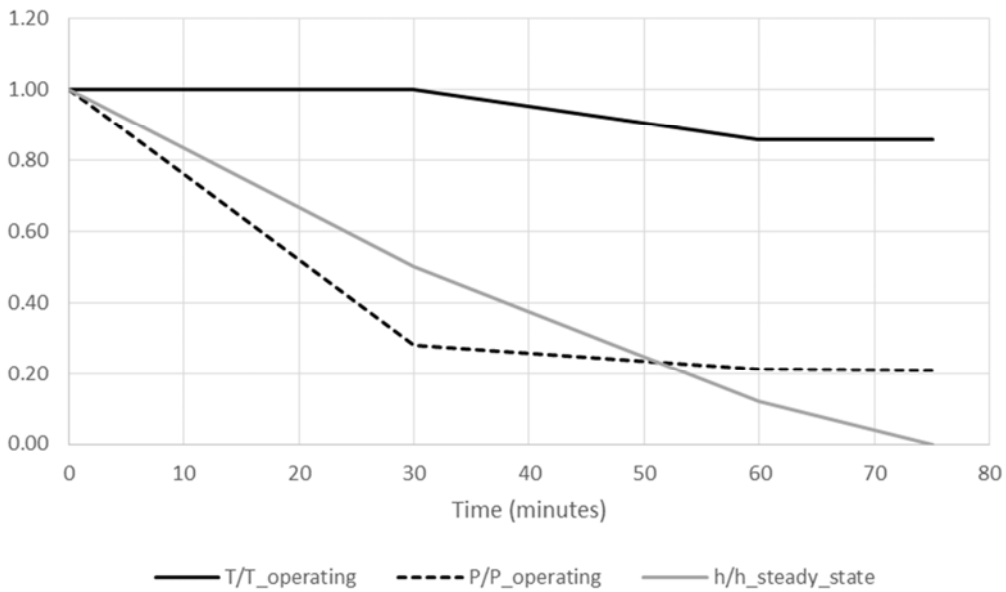


Shutdown (Normalized)						
Time (min.)	SH Temp	RH Temp	SH Flow	RH Flow	SH press	RH press
0	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	0.50	0.50	0.47	0.28
60	0.85	0.86	0.10	0.12	0.46	0.21
75	0.85	0.86	0.00	0.00	0.31	0.21

Normalized Transient Conditions for Superheater - Shutdown



Normalized Transient Conditions for Reheater - Shutdown







**ATTACHMENT 2: ANALYSIS MATRIX**

Component	Material Grade	API 579 (Analysis Method (a))	R5 (Analysis Method (c))	BLESS (Analysis Method (b))
Superheater Tube	Grade 22	X	X	X
	Grade 91	X	X	X
	TP 304H	X	X	
Reheater Tube	Grade 22	X	X	X
	Grade 91	X	X	X
	TP 304H	X	X	
Superheater Pipe	Grade 22	X	X	X
	Grade 91	X	X	X
Reheater Pipe	Grade 22	X	X	X
	Grade 91	X	X	X
Total Cases		120	120	96



**ATTACHMENT 3: ANALYSIS REQUIREMENTS**

Analysis Method (a)

Component	Material	OD (in.)	Thickness (in.)	Design		Operational		Design Allowable	Minimum Thickness (in.)	Flaw Orientation		Flaw Location			Flaw Geometries	
				Pressure (psig)	Temperature (F)	Pressure (psig)	Temperature (F)	Stress (ksi)	From A317	Circumferential	Longitudinal	Inside Surface	Outside Surface	Mid-wall (subsurface)	Infinite length/full	6:1 semi-elliptical
Superheater Tube	Grade 22	2	0.270	4250	900	3950	875	13.6	0.268							
	Grade 91	2	0.500	4200	1135	3900	1100	7.99	0.409							
	TP 304H	2	0.400	4200	1135	3900	1100	8.33	0.396							
Reheater Tube	Grade 22	2	0.105	800	900	700	875	13.6	0.057							
	Grade 91	2	0.105	800	1135	700	1100	7.99	0.095							
	TP 304H	2	0.105	800	1135	700	1100	8.33	0.092							
Superheater Pipe	Grade 22	14	3.250	4250	1025	3950	1005	6.85	3.236							
	Grade 91	14	2.200	4200	1085	3900	1050	11.41	2.156							
Reheater Pipe	Grade 22	28	1.600	800	1025	700	1005	6.85	1.543							
	Grade 91	28	1.000	800	1085	700	1050	11.41	0.948							

Analysis Method (b)

Component	Material	OD (in.)	Thickness (in.)	Design		Operational		Design Allowable	Minimum Thickness (in.)	Flaw Orientation		Flaw Location			Flaw Geometries	
				Pressure (psig)	Temperature (F)	Pressure (psig)	Temperature (F)	Stress (ksi)	From A317	Circumferential	Longitudinal	Inside Surface	Outside Surface	Mid-wall (subsurface)	Infinite length/full	6:1 semi-elliptical
Superheater Tube	Grade 22	2	0.270	4250	900	3950	875	13.6	0.268							
	Grade 91	2	0.500	4200	1135	3900	1100	7.99	0.409							
	TP 304H	2	0.400	4200	1135	3900	1100	8.33	0.396							
Reheater Tube	Grade 22	2	0.105	800	900	700	875	13.6	0.057							
	Grade 91	2	0.105	800	1135	700	1100	7.99	0.095							
	TP 304H	2	0.105	800	1135	700	1100	8.33	0.092							
Superheater Pipe	Grade 22	14	3.250	4250	1025	3950	1005	6.85	3.236							
	Grade 91	14	2.200	4200	1085	3900	1050	11.41	2.156							
Reheater Pipe	Grade 22	28	1.600	800	1025	700	1005	6.85	1.543							
	Grade 91	28	1.000	800	1085	700	1050	11.41	0.948							

Analysis Method (c)

Component	Material	OD (in.)	Thickness (in.)	Design		Operational		Design Allowable	Minimum Thickness (in.)	Flaw Orientation		Flaw Location			Flaw Geometries	
				Pressure (psig)	Temperature (F)	Pressure (psig)	Temperature (F)	Stress (ksi)	From A317	Circumferential	Longitudinal	Inside Surface	Outside Surface	Mid-wall (subsurface)	Infinite length/full	6:1 semi-elliptical
Superheater Tube	Grade 22	2	0.270	4250	900	3950	875	13.6	0.268							
	Grade 91	2	0.500	4200	1135	3900	1100	7.99	0.409							
Reheater Tube	Grade 22	2	0.105	800	900	700	875	13.6	0.057							
	Grade 91	2	0.105	800	1135	700	1100	7.99	0.095							
Superheater Pipe	Grade 22	14	3.250	4250	1025	3950	1005	6.85	3.236							
	Grade 91	14	2.200	4200	1085	3900	1050	11.41	2.156							
Reheater Pipe	Grade 22	28	1.600	800	1025	700	1005	6.85	1.543							
	Grade 91	28	1.000	800	1085	700	1050	11.41	0.948							

ASME Standards Technology, LLC  
**REQUEST FOR PROPOSALS**  
RFP No. 19-01



**ATTACHMENT 4: FORM OF AGREEMENT**

**ASME Standards Technology, LLC**  
**Nonexclusive Independent Consultant Agreement**  
**Standard Terms and Conditions**  
**[Insert Title]**

This Agreement, dated as of [\_\_\_\_\_], is made between ASME Standards Technology, LLC (“ASME ST-LLC”), a New York not-for-profit corporation with its principal office at Two Park Avenue, New York, New York 10016 and [Insert Consultant Name and Address, spelled out completely without zip code] (the “Independent Consultant”).

**W I T N E S S E T H:**

**WHEREAS** ASME ST-LLC desires to engage the Independent Consultant to perform [insert scope description] for [Project name]; and

**WHEREAS** the Independent Consultant agrees to accept such engagement and to perform the services hereinafter specified;

**NOW, THEREFORE**, in consideration of the foregoing and the mutual agreements of the parties contained in this Agreement, it is agreed as follows:

**1. Engagement.** ASME ST-LLC hereby engages the Independent Consultant, on an as needed and nonexclusive basis, to perform the services defined in Annex 1 to this Agreement (the “Work”).

**2. Performance.** The Independent Consultant agrees to perform the services set forth above. The Independent Consultant agrees to perform such services professionally and to the best of its ability, to provide the services in an ethical manner, and to avoid conflicts of interest and any appearance thereof. It is understood that the Independent Consultant may obtain other consulting work and, as a result, may be unavailable, from time to time, to perform consulting services for ASME ST-LLC, but the Independent Consultant agrees to adhere to the ASME Policies on Conflicts of Interest and Ethics. ASME ST-LLC will not set specific daily schedules. ASME ST-LLC will not provide tools, materials, supplies or equipment necessary for the Independent Consultant to perform the Work except for the necessary codes, standards, and procedures. Neither will ASME ST-LLC reimburse the Independent Consultant for the use of its tools, materials, supplies or equipment. The Independent Consultant shall not engage



ASME ST-LLC  
Independent Consultant Agreement  
[Consultant]  
[Project Title]

subcontractors to perform any portion of the Work without the written approval of ASME ST-LLC. If Independent Consultant services require access to ASME ST-LLC or ASME systems or their internal networks, that access must conform with ASME and ASME ST-LLC use policies.

**3. Fees.** For all services to be rendered by the Independent Consultant to ASME ST-LLC, as required by ASME ST-LLC, the Independent Consultant will receive fees as specified in Annex 2 to this Agreement. It is understood and agreed that the Independent Consultant is performing services as an independent contractor. As a result, ASME ST-LLC will not withhold any tax, of whatever nature, from payments made by ASME ST-LLC to the Independent Consultant. The Independent Consultant is solely responsible for meeting federal, state, or local income tax liabilities. The total charges for all fees and expenses shall not exceed the contract value specified in Annex 2 to this Agreement.

**4. Expenses.** Expenses incurred by the Independent Consultant in connection with the Work shall be borne by the Independent Consultant as part of the total compensation for the Work.

**5. Terms of Payment.** The Independent Consultant shall submit associated invoices for acceptance by ASME ST-LLC prior to payment. Invoices shall be submitted following achievement of milestones specified in Annex 2 to this Agreement. Payment shall be 100 percent net due 30 days after receipt of an acceptable invoice from the Independent Consultant.

**6. Benefits.** The Independent Consultant is not eligible for, and will not receive, any benefits from ASME ST-LLC based on services performed under this Agreement.

**7. Copyright and Ownership.** The Independent Consultant agrees that ASME ST-LLC specially ordered and commissioned the Work as “work made for hire” as that term is defined in the United States Copyright Act (17 U.S.C. §101), and that for purposes of the copyright laws, ASME ST-LLC shall be deemed the “author” of the Work. If it is determined that the Work is not a work made for hire under the U.S. Copyright laws, then, as of the creation of the Work, the Independent Consultant hereby assigns exclusively and irrevocably to ASME ST-LLC all worldwide, present and future right, title and interest in the Work, including the copyrights and other proprietary rights existing in the Work (including all United States and

ASME ST-LLC  
Independent Consultant Agreement  
[Consultant]  
[Project Title]

foreign copyrights, all copyrights under any treaties, conventions, proclamations, or the like, and all extensions of such copyrights; all artistic and literary property rights; all moral rights; all rights to apply for or obtain any registrations for copyright in the Independent Consultant's name; and the right to sue and recover for any infringement of the Work). The Independent Consultant may not reproduce the Work in any form without ASME ST-LLC's prior written permission.

**8. Indemnification and Hold Harmless.**

**a. Obligation of the Independent Consultant** – The Independent Consultant shall indemnify, defend and hold harmless ASME ST-LLC and its officers, directors, employees and agents and each of them from any and all claims, actions, causes of action, demands, liabilities of whatsoever kind and nature including judgments, interest, attorney's fees, and all other costs, fees, expenses and charges which ASME ST-LLC, its officers, directors, employees, agents and each of them, may incur arising out of the negligence, gross negligence or willful or wanton misconduct of the Independent Consultant, its officers, directors, employees or agents.

**b. Obligation of ASME ST-LLC** – ASME ST-LLC shall indemnify, defend and hold harmless the Independent Consultant and its officers, directors, employees and agents and each of them from any and all claims, actions, causes of action, demands, liabilities of whatsoever kind and nature including judgments, interest, attorney's fees, and all other costs, fees, expenses and charges which the Independent Consultant, its officers, directors, employees, agents and each of them, may incur arising out of the negligence, gross negligence or willful or wanton misconduct of ASME ST-LLC, its officers, directors, employees or agents.

**9. Term.** It is mutually agreed that the Independent Consultant will commence work on this project immediately upon execution of this Agreement, and continue until completion, estimated as on or about [Contract End Date]. This termination date may be extended by mutual agreement, which must be confirmed in writing.

**10. Termination.** ASME ST-LLC shall have the right to terminate this agreement upon 14 days notice in writing to the Independent Consultant at any time that ASME ST-LLC shall in its judgment decide that such termination is in the best interests of ASME ST-LLC. Conversely, the Independent Consultant shall have the right to terminate this agreement upon 14 days' notice in writing to ASME ST-LLC at any time that the Independent

ASME ST-LLC  
Independent Consultant Agreement  
[Consultant]  
[Project Title]

Consultant shall in its judgment decide that such termination is in the best interests of the engineering profession. In the event of such termination, ASME ST-LLC shall pay the Independent Consultant on a pro rata basis for percent of work completed as determined by mutual agreement subject to the provisions of Sections 3 and 4 of this Agreement.

**11. Force Majeure.** The parties' performance under this contract is subject to acts of God, war, government regulation, terrorism, disaster, strikes, civil disorder, curtailment of transportation facilities, or any other emergency beyond the parties' control, making it inadvisable, illegal or which materially affects a party's ability to perform its obligations under this contract. Either party may terminate this contract for any one or more of such reasons upon written notice to the other party.

**12. Trademark Usage.** Independent Consultant may not use any of ASME ST-LLC's trademarks or other identifiers (including the ASME ST-LLC logo) in any manner without ASME ST-LLC's prior written approval or consent. ASME ST-LLC reserves the right to review any approved use of its trademarks and to require changes in any further use, and Independent Consultant agrees to comply with those requirements.

**13. Publicity Release and Public Affairs.** The Independent Consultant shall not make without prior review and approval of ASME ST-LLC, any publicity release of any nature of general, non-technical information in connection with this Agreement. For purposes of this Agreement, general, non-technical information means any information concerning the existence of the Agreement, the identity of the parties, and the scope and general character of the research or technical activity.

**14. Entire Agreement.** This Agreement entirely supersedes, terminates, and replaces any and all prior agreements between the parties relating to the subject matter hereof and may not be amended except by an instrument in writing signed by both parties to this Agreement.

**15. Notices.** Any notices hereunder shall be given to the parties at their respective addresses set forth above by registered mail until a new and different address shall be established for either party on the basis of notice given to the other party.

**16. Governing Law.** This Agreement shall be subject to and governed by the substantive laws of the State of New York (without regard to its conflict of laws rules).

# Attachment 4

ASME ST-LLC  
Independent Consultant Agreement  
[Consultant]  
[Project Title]

**IN WITNESS WHEREOF**, ASME ST-LLC has caused this Agreement to be executed on its behalf by its officer thereunto duly authorized and the Independent Consultant has executed this Agreement as of the day and year first above written.

## **ASME STANDARDS TECHNOLOGY, LLC**

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

Name:

Title:

## **INDEPENDENT CONSULTANT**

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

Name:

Title:

[Social Security] or [Federal Tax ID number]: [\_\_\_\_\_]

# Attachment 4

ASME ST-LLC  
Independent Consultant Agreement  
[Consultant]  
[Project Title]

ANNEX 1

## **Annex 1 – Statement of Work**

### **Scope Description**

[TBD]

# Attachment 4

ASME ST-LLC  
Independent Consultant Agreement  
[Consultant]  
[Project Title]

ANNEX 1

ASME ST-LLC  
Independent Consultant Agreement  
[Consultant]  
[Project Title]

ANNEX 2

## Annex 2 – Financial Terms

### Reporting

### Fees and Expenses

Technical services rate: [\_\_\_\_\_].

Travel rate (if applicable): [\_\_\_\_\_].

Travel expenses: [\_\_\_\_\_].

Contract Maximum: [\_\_\_\_\_].

# Attachment 4

ASME ST-LLC  
Independent Consultant Agreement  
[Consultant]  
[Project Title]

ANNEX 2