

**SARA SAE ENGINEERING SPECIFICATION****Section: SES 26 – 769****Issue: “B”****Rev No: “4”****Eff. Date: 20.05.2024****Page: 1 of 6**

**PROCEDURE FOR VALIDATION OF  
OUTSOURCED /INHOUSE PROCESSES  
(HT/PLATING/NDT/WELDING/PAINTING)**

<b>Rev</b>	<b>Reason of Change</b>	<b>Date</b>	<b>Made By</b>	<b>Reviewed By</b>	<b>Approved By</b>	<b>Status</b>
0	Initial Release	12-03-2014	KKM	J Gulati	KKD	Released
1	Revalidation clause added	30-05-2014	KKM	J Gulati	KKD	Released
Issue “B” Rev-0	Complied to Q1 -9 <sup>th</sup> Edn	06-12-2015	AS	NS	KKD	Released
Issue “B” Rev-1	To include welder qualification requirement in clause 3.3.2 & 3.3.3	07-07-2016	AS	NS	KKD	Released
Issue “B” Rev -2	Clause 3.2.6 revalidation of NDE amended. And Painting process added	25.11.2019	SK	MN	AS	Released
Issue “B” Rev -3	Revised to incorporate requirement master equipment calibration details	01.03.2023	FAA	HU	JG	Released
Issue “B” Rev -4	Revised to incorporate requirement as per API 16C-3 <sup>rd</sup> & API -Q1-10 <sup>th</sup> Ed.	20.05.2024	FAA	HU	JG	Released



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## 1. PURPOSE

- 1.1. To describe the methods to validate the outsourced processes

## 2. SCOPE

- 2.1. Following procedures require Validation: -

- Heat Treatment
- NDT -(MPT/LPT/UT/RT)
- Welding
- Plating & Painting- (when identified by the product specification or by the SARA as critical to product performance)**

## 3. METHODOLOGY

### 3.1. Heat Treatment

#### 3.1.1. Equipment

Equipment Type	Calibration	Frequency of Calibration
Furnaces	As per Annex M of API 6A	Yearly
Recorders & Controllers	As per Annex M of API 6A	Quarterly
Temperature Indicators	As per Annex M of API 6A	Quarterly
Thermocouples	As per Annex M of API 6A	Quarterly

#### 3.1.2. Qualification of Personnel

- Furnace Operators - Trained in HT Processes. Should be able to operate both Continuous & Batch Type furnaces.
- Production Supervisor - ITI with training on HT process
- Inspector – ITI with training on HT process
- ASNT- SNT-TC-1A Level-2 qualified**

#### 3.1.3. Methods

As per details covered under relevant Sara Engineering Specifications

#### 3.1.4. Acceptance Criteria

As per details covered under relevant Engineering Specification mentioned at 3.1.3



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3.1.5. Records: Following records will be maintained :

- A. Material Test Reports (Mill/Independent Lab)
- B. Heat Treatment Graphs
- C. Mechanical Test Reports -Test results of relevant QTC and production lot
- D. Calibration records of equipment's used for production with a copy of master used for calibration.

3.1.6. Revalidation

Heat treatment process is re-validated will be done as per any one of following criteria:

- A. Whenever there is change in SARA specified material specification which impact HT process performance**  
OR
- B. API Specification requirement of Heat Treatment process**  
OR
- C. Change in supplier equipment qualification**

3.2. NDT -(MPT/LPT/UT/RT)

3.2.1. Equipment

As per details contained in Sara NDT Procedure of relevant practice.

3.2.2. Qualification of Personnel

SNT-TC-1A Qualified Level 2 of relevant practice in accordance with Sara Written practice for training, qualification & certification of NDT personnel.

3.2.3. Methods

As prescribed in relevant practice procedures below-

- A. SES-26-701 for Procedure for Liquid Penetration Testing**
- B. SES-26-702 for Procedure for Ultrasonic Testing**
- C. SES-26-703 for Procedure for Radiographic Testing**
- D. SSE-QAD-MT-1/97 for Procedure for Magnetic Particle Testing**

3.2.4. Acceptance Criteria

**As per relevant clause of API - 6A/16A/16C/16D acceptance criteria defined in Sara NDT Procedure listed at 3.2.3 above.**

3.2.5. Records: Following records will be maintained



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- A. NDE reports traceable to lot.
- B. Level-2 certificate of the technician.
- C. Calibration certs of the Equipment used for production with a copy of master used for calibration.
- D. For Liquid penetrant test Cert of the chemicals used for Examination
- E. Radiographic films for RT.

### 3.2.6. Revalidation

NDE process is re-validated will be done as per any one of following criteria:

- A. If NDE is not performed within 12 months interval then re-validation shall be performed prior to performing NDE**  
OR
- B. Whenever there will be any changes in NDE codes or API products specification that affects the NDT process performance.**  
OR
- C. When change in essential variables as per NDE procedures**

### 3.3. Welding

#### 3.3.1. Equipment

SMAW Technique – Arc welding machines & Instruments

GTAW Technique -

- A. Power Source
- B. Torch
- C. Backing System
- D. Protective Equipment
- E. Material based consumables

Calibration frequency – six months

#### 3.3.2. Qualification of Personnel

As per ASME-IX & conformity with relevant API product specification and base material requirement

#### 3.3.3. Method

As per ASME-IX & as per applicable API product specification

#### 3.3.4. Acceptance Criteria

**As per ASME –IX & relevant clause of API –6A/16A/16C/16D**

#### 3.3.5. Records: Following records will be maintained



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- A. WPS (as per ASME-IX)
- B. PQR (as per ASME-IX)
- C. WPQ (as per ASME-IX)
- D. Welder continuity Record
- E. Calibration of welding equipment for production with a copy of master used for calibration.

3.3.6. Revalidation – Requalification of the welding operator/procedure the process is re-validated will be done as per any one of following criteria:

- A. Ref code ASME –IX**  
OR
- B. Essential variables ASME –IX**  
OR
- C. Changes in WPS results in Welder qualification records**  
OR
- D. Equipment qualification**  
OR
- E. Operator not performed welding for more than six months.**

#### 3.4. Plating

##### 3.4.1. Equipment

- A. Electrolysis Tanks
- B. Tanks – degreasing/ cleaning/coating
- C. Rectifiers
- D. Coating based electrolytes and chemicals
- E. Testing instruments

##### 3.4.2. Qualification of Personnel

Platers – to be trained on electroplating techniques and surface finishes should be able to recognize deviation and faults in product/process.

##### 3.4.3. Method

As per details contained in Sara Documented Procedure

- A. SES 26-731B - Application of Zinc Plating on Carbon and Low Alloy Steels.
- B. SES 26-736 - Silver Palladium/Electro Deposit /Brush Plating Coating.
- C. SES 26-775 – Manganese/Nickel phosphate coating for carbon and low alloy steel parts to decrease friction and galling.
- D. SES 26-787 - Molybdenum Disulfide (MoS<sub>2</sub>) Coating.
- E. SES 26-730 – Application of Zinc Phosphate Coating to carbon and Low Alloy steels.

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#### 3.4.4. Acceptance Criteria

As per the details contained in Sara Document mentioned at 3.4.3.

#### 3.4.5. Records

- A. Plating acceptance records
- B. Calibration certs of the Equipment used for production with a copy of master used for calibration

#### 3.4.6. Revalidation

Validated will be done as per any one of following criteria:

- A. If Plating is not performed within 12 months interval then re-validation shall be performed prior to performing Plating Process**  
**OR**
- B. Whenever there is change in methods which affects the performance of plating process a re-qualification is required.**

### 3.5. Painting

#### 3.5.1. Equipment

- A. Abrasive blasting
- B. Tanks – degreasing/ cleaning
- C. Spray gun
- D. Testing instruments

#### 3.5.2. Qualification of Personnel

Painters – To be trained on painting techniques and surface finishes should be able to recognize deviation and faults in product/process.

Shot Blaster – To be trained on shot blasting techniques and surface finishes should be able to recognize deviation and faults in product/process.

#### 3.5.3. Method

As per details contained in Sara Documented Procedure

- A. SES 26-602- Surface treatment specification, paint.

#### 3.5.4. Acceptance Criteria

As per the details contained in Sara Document mentioned at 3.5.3. and shall be validated after satisfactory completion of Salt spray test.

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### 3.5.5. Records

- A. Painting acceptance records
- B. Calibration certs of the Equipment used for production with a copy of master used for calibration

### 3.5.6. Revalidation

Whenever there is change in methods which affects the performance of painting process a re-qualification is required.

## 4. RESPONSIBILITIES

- 4.1. Assessment of vendors – Materials + QC (as per Doc SDP-31-003)
- 4.2. Quality Technicians are responsible for ensuring that all required inspections and/or tests specified above including those given in the relevant specs / drawings and those specified by customer (if any) are performed and items accepted as per criteria laid for acceptance.
- 4.3. Records shall be maintained by Manager QC
- 4.4. Manager QC will be responsible for revalidation of the procedure(s)

## 5. Nonconformance – To be handled as per Sara Procedure SDP-27-010