
	SARA SAE ENGINEERING SPECIFICATION	
	Section: SES 26 – 769	
	Issue: “B”	Rev No: “4”
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**PROCEDURE FOR VALIDATION OF
OUTSOURCED /INHOUSE PROCESSES
(HT/PLATING/NDT/WELDING/PAINTING)**

Rev	Reason of Change	Date	Made By	Reviewed By	Approved By	Status
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 th 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 rd & API -Q1-10 th 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: -

- A. Heat Treatment
- B. NDT -(MPT/LPT/UT/RT)
- C. Welding
- D. **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


- A. Furnace Operators - Trained in HT Processes. Should be able to operate both Continuous & Batch Type furnaces.
- B. Production Supervisor - ITI with training on HT process
- C. Inspector – ITI with training on HT process
- D. **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 (MoS₂) 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