Engineering Standard
SAES-A-004  14 December 2009
General Requirements for Pressure Testing

Inspection Engineering Standards Committee Members
Kakpovbia, Anthony Eyankwier, Chairman
Rajeh, Saleh Rashid, Vice Chairman
Albarillo, Rodolfo Celino
Anazy, Khalid Juma
Boult, David
Carrera, Rene L
Ghamdi, Khalid Salem
Ingram, James Young
Keen, Peter David
Khunaizi, Mohammad Redhi
Langla, Edward Charles
Mc Ghee, Patrick Timothy
Mohsen, Hassan Abdallah
Seyed Mohamed, Abdul Cader
Shammary, Hamed Abdulwahab
Stockenberger, Hans J
Suwaidan, Khalid Ali

Saudi Aramco DeskTop Standards
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1 Scope

1.1 This standard defines mandatory general requirements governing in-situ pressure testing of new and existing pipelines, plant piping and pressure containing process equipment (hereinafter called equipment). Specific requirements are covered in the specific SAESs applicable to that equipment or piping system. This standard supplements ASME B31’s and other applicable codes.

1.2 The requirements of this standard apply to field/shop fabricated piping systems and field fabricated equipment.

1.3 This standard does not cover pressure testing of new, shop fabricated equipment such as vessels, tanks, heat exchangers and skid mounted piping which are purchased in accordance with the applicable SAMSS.

Exception:

Fin-fan coolers are to be tested in accordance with paragraph 7.4.5.

1.4 This standard applies to pre start-up leak tests normally conducted by Operations during start-up, commissioning and T&I of the facilities in accordance with approved plant operating procedures.

1.5 This standard does not apply to equipment as excluded in section 8.2.

2 Conflicts and Deviations

2.1 Any conflicts between this standard and other applicable Saudi Aramco Engineering Standards (SAES's), Materials System Specifications (SAMSS's), Standard Drawings (SASD's), or industry standards, codes, and forms shall be resolved in writing by the Company or Buyer Representative through the Manager, Inspection Department of Saudi Aramco, Dhahran.

2.2 Direct all requests to deviate from this standard in writing to the Company or Buyer Representative, who shall follow internal company procedure SAEP-302 and forward such requests to the Manager, Inspection Department of Saudi Aramco, Dhahran.
3 References

The selection of material and equipment, and the design, construction, maintenance, and repair of equipment and facilities required by this standard shall comply with the latest edition of the references listed below, unless otherwise noted.

3.1 Saudi Aramco References

Saudi Aramco Engineering Procedures

SAEP-302
Instructions for Obtaining a Waiver of a Mandatory Saudi Aramco Engineering Requirement

SAEP-327
Disposal of Wastewater from Cleaning, Flushing, and Dewatering Pipelines and Vessels

Saudi Aramco Engineering Standards

SAES-A-005
Safety Instruction Sheet

SAES-A-007
Hydrostatic Testing Fluids and Lay-up Procedures

SAES-B-017
Fire Water Systems

SAES-D-008
Repairs, Alteration, and Re-rating of Process Equipment

SAES-D-108
Repair, Alteration and Reconstruction of Storage Tank

SAES-D-109
Design of Small Tanks

SAES-H-001
Coating Selection & Application Requirements for Industrial Plants & Equipment

SAES-H-101
Approved Protective Coating Systems for Industrial Plants and Equipment

SAES-K-001
Heating, Ventilating and Air-Conditioning

SAES-L-108
Selection of Valves

SAES-L-109
Selection of flanges, Stud Bolts and Gaskets

SAES-L-150
Pressure Testing of Plant Piping and Pipelines

SAES-L-350
Construction of Plant Piping

SAES-J-901
Instrument Air Supply Systems

SAES-S-020
Oily Water Drainage Systems

SAES-S-030
Storm Water Drainage

SAES-S-040
Saudi Aramco Water Systems
General Requirements for Pressure Testing

SAES - S-060  Saudi Aramco Plumbing Code
SAES - S-070  Installation of Utility Piping Systems

Saudi Aramco Materials System Specifications

01-SAMSS-010  Fabricated Carbon Steel Piping
04-SAMSS-048  Valve Testing and Inspection Requirements
32-SAMSS-004  Manufacturing of Pressure Vessels
32-SAMSS-005  Manufacturing of Atmospheric Tanks
32-SAMSS-006  Manufacturing of Low Pressure Tanks
32-SAMSS-029  Manufacturing of Fired Heaters

Saudi Aramco Form and Data Sheet

Form SA-2642-ENG  Pressure Test Report Form

Saudi Aramco General Instructions

GI-0002.102  Pressure Testing Safely
GI-1781.001  Inspection, Testing and Maintenance of Fire Protection Equipment

Saudi Aramco Bottled Gas Manual Section V

3.2 Industry Codes and Standards

American Petroleum Society

API RP 520  Part I - Sizing, Selection, and Installation of Pressure Relieving Devices in Refineries

American Society of Heating, Refrigerating and Air Conditioning Engineers

ASHRAE Std 15  Safety Code for Mechanical Refrigeration

American Society of Mechanical Engineers

ASME B31.1  Power Piping
ASME B31.3  Process Piping
ASME B31.4  Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids
ASME B31.5  Refrigeration Piping
ASME B31.8  Gas Transmission and Distribution Piping Systems
ASME B31.9  Building Services Piping
ASME SEC 1  Rules for Construction of Power Boilers
4 Definitions

Pressure Test: A test conducted to piping or equipment by subjecting it to an internal pressure using liquid or gas to ensure strength or tightness of the system at the test pressure. Pressure test may be a:

- **Hydrostatic Test**: A pressure test conducted using water or other approved liquid as the test medium.
- **Pneumatic Test**: A pressure test conducted using air or other approved gas as the test medium or in conjunction with liquid.
- **Pre Start-up Leak Test**: A pressure test to ensure tightness of flanged and threaded joints at normal operating pressure. It is normally conducted before initial start-up, during commissioning or after T&Is.
- **Revalidation Test**: A pressure test performed to prove the integrity of existing piping or equipment. This test is administered by the proponent organization.
- **Service Test**: A pressure test conducted at operating pressure using the service fluid.
- **Strength Test**: A pressure test at an internal pressure determined in accordance with this standard and the applicable Code to verify the integrity of the piping systems or equipment for service at the design pressure.
- **System Test**: An in-situ pressure test applied to a group of piping and equipment tested as a system.
- **Tightness Test**: A pressure test to ensure tightness of the piping system (i.e., no leaks in the system) at the test pressure.

Pressure Test Procedure. Information assembled to ensure all requirements listed in GI-0002.102, all referenced Saudi Aramco standards and Industrial standards are met. Senior Operations’ Representative. The Lead or most senior operations’ representative on a new construction project and may be a Facility / Plant Manager if one has been appointed.
5 General Requirements

5.1 General Instruction GI-0002.102 "Pressure Testing Safely" shall be followed during pressure testing.

5.2 Pneumatic testing

5.2.1 Pneumatic testing is not permitted without written approval of the Manager, Inspection Department, unless specifically allowed by this standard or the referenced Saudi Aramco SAESs or SAMSSs. This test, when conducted, shall be in accordance with GI-0002.102 for additional safety requirements.

5.2.2 Pneumatic testing with air of piping systems or equipment which have been in flammable service shall be concurred by the Manager, Loss Prevention Department.

5.3 The effect of the static head of the testing liquid shall be considered when determining the effective test pressure of any elements within a tested system.

5.4 Test pressures and test durations shall be based on the applicable Aramco standards.

5.5 Protection from Overpressure

All systems (piping and equipment) while being pressure tested shall be protected from being over pressured by the following:

5.5.1 Pressure test relief valve(s) of adequate capacity set to relieve at 5% above the test pressure shall be installed unless the test pressure is less than 85% SMYS at which time it can be set at 10% above the test pressure. Sizing of these relief valves used for testing shall follow the requirements of API RP 520, Part 1. The relief valve(s) shall be tested, dated, and tagged within one week prior to the pressure test for new construction projects, and within one month for maintenance operations. The pressure test relief valve shall be accompanied with a calibration certificate that includes the cold differential test pressure (CDTP), test date and the spring range. The CDTP shall be within the spring range.

5.5.2 In addition to the pressure relieving device, a bleed valve shall be provided to protect the piping and equipment from overpressure. The bleed valve shall be readily accessible in case immediate depressurization is required.

5.5.3 An isolation valve shall be provided between the pressure testing manifold and the system being tested. The isolation valve shall be rated for the manifold test pressure when in the closed position.

5.5.4 Before employing the pressure testing manifold in the actual system pressure test, it shall be separately pressure tested to at least 1.2 times the
system test pressure but not less than the discharge pressure of the pump used for the pressure testing.

5.5.4.1 The test manifold shall be designed and constructed to meet the minimum system requirements and approved by the Engineering Division head in operating facilities or responsible Project Inspection Division head in new construction.

5.5.4.2 Test manifolds shall have 100% NDT of all welds.

5.5.4.3 Test manifolds for new construction shall be revalidated for each new project and every 60 months for operating facilities.

Commentary Note:
System requirements include pressure and temperature ratings on the piping and fittings for the equipment and piping being tested.

5.6 Pressure Test Procedure

5.6.1 A pressure test procedure shall be prepared by the responsible engineering group and made available to responsible inspection group prior to conducting the test. The test procedure shall be available on site at all times.

5.6.2 The pressure test procedure shall include all required documentation specified in GI-0002.102, paragraph 5.1.2.

5.6.3 During a pneumatic pressure test a leak test shall be performed in accordance with ASME SEC V Article 10 and Article 10 Appendix I except the pressure shall be 5 - 10 psi. A calculation sheet indicating adequacy of the pressure test relief valve shall be included in the procedure.

5.7 The requirement for pre start-up leak tests and service tests during initial start-up and T&Is shall be as follows:

5.7.1 New systems after strength tests and prior to initial start-up:

5.7.1.1 For systems with maximum operating pressures greater than 6.894 MPa (1000 psi), a leak test with inert gas, followed by a service test, shall be conducted at the maximum operating pressure of the piping system. Oil flowlines, trunklines, testlines and water injection lines are excluded from this requirement.

5.7.1.2 For systems with maximum operating pressures less than 6.894 MPa (1000 psi), a pre start-up leak test with inert gas or steam (if designed for steam service) shall be conducted at the available inert gas or steam system pressure (not exceeding the maximum operating pressure), or pressure as recommended by the facility Engineering Unit responsible for developing the test
package, followed by a service test at normal operating pressure of the piping systems. When inert gas or steam are not available, the service test will satisfy the pre start-up leak test requirements.

5.7.2 Existing systems after T&Is:

5.7.2.1 For systems with maximum operating pressures greater than 6.894 MPa (1000 psi) which are in hydrogen service or in sour service with hydrogen sulfide concentrations higher than 0.1 mole %:

5.7.2.1.1 A pre start-up leak test with inert gas shall be conducted after major T&Is. The test pressure shall be determined by the plant Operating Department. For minor T&Is, the pre start-up leak test shall be conducted per 5.7.2.2.

5.7.2.1.2 The pre start-up leak test shall be followed by a service test at the normal operating pressure of the piping.

Commentary Note:

A major T&I is defined as either a catalyst change or a major disassembly of flanges, gaskets, etc. The local Operations Engineering Unit and Inspection Unit have the responsibility to define when a T&I is considered as major. This definition must be made during the pre-T&I scope of work to allow Operations sufficient time to have inert gas on-site prior to start-up of the facility.

5.7.2.2 For all other systems and pressures, a pre start-up leak test with inert gas or steam (if designed for steam service) shall be conducted at the available inert gas or steam system pressure (not exceeding the maximum operating pressure), or at pressure as recommended by responsible Operations Engineering Unit, followed by a service test at normal operating pressure of the piping systems. When inert gas or steam are not available, the service test will satisfy the pre start-up leak test requirements.

5.7.2.3 Procedures for both pre start-up leak tests and service tests shall address, to the extent possible, the safety precautions provided in GI-0002.102 "Pressure Testing Safely."

5.8 If the drop in ambient temperature may cause the test medium to freeze during the test, appropriate precautionary measures must be taken to protect the equipment or piping systems.
6 Utilizing Non-Destructive Testing (NDT) in Lieu Of Pressure Testing

6.1 A request to utilize NDT in-lieu of pressure testing shall be submitted for approval as permitted in the specific SAES listed in Section 7- “Specific Testing Requirement” below. A sample request form is provided in Appendix I. This form shall be processed and approved prior to NDT.

6.2 The facility/plant manager will approve the request to utilize NDT in-lieu of pressure testing for existing facilities and the senior operations’ representative for new construction projects.

6.3 The request for NDT in lieu of hydrotest shall include the requirement for the proponent to:

6.3.1 Utilize skilled welders with rejection rate of less than five (5) percent on a joint basis or 0.2% on a linear basis in the most recent past 12 months.

6.3.2 Use approved Welding Procedure Specification (WPS).

6.3.3 Visually inspect the root and cap pass during the welding process with a Saudi Aramco inspector.

6.3.4 Perform 100% radiographic testing (RT) of the butt welds.

6.3.5 Perform 100% advanced ultrasonic testing (UT; TOFD and/or Phased Array) of all welds.

6.3.6 RT and advanced UT to be interpreted by ASNT Level III personnel.

6.4 A flange tester could be utilized to conduct hydrostatic testing of the flange butt weld in case of flanged tie-in connections.

7 Specific Testing Requirement

This section specifies in details which piping or equipment that shall be pressure tested and provides the specific applicable standard. It also defines any specific exemptions.

7.1 Plant Piping

Pressure testing of plant piping shall be in accordance to 01-SAMSS-010, SAES-L-150 and SAES-J-901 for instrument air piping.

7.2 Cross-Country Pipelines

Pressure testing of cross country pipelines shall be in accordance to 01-SAMSS-010 and SAES-L-150.

7.3 Pressure Vessels

7.3.1 Hydrostatic testing for new vessels (shop or field fabricated) shall be conducted as follows:

ASME SEC VIII D1 to 32-SAMSS-004, Paragraph 16.3.8.1.

ASME SEC VIII D2 to 32-SAMSS-004, Paragraph 16.3.8.2.
Pneumatic test, when approved (refer to paragraph 5.2), shall be conducted per UG-100 of ASME SEC VIII D1, or T-4 of ASME SEC VIII D2, whichever is applicable.

7.3.2 Pressure testing of small diameter vessels shall be per the appropriate standard as specified in SAES-D-109.

7.3.3 Hydrostatic testing for existing vessels shall be conducted per SAES-D-008, Paragraph 10.1.

7.4 Heat Transfer Equipment

7.4.1 Hydrostatic tests for existing equipment shall be in accordance with SAES-D-008.

7.4.2 For pneumatic testing, refer to paragraph 7.3.1

7.4.3 Hydrostatic testing of new, field fabricated boilers shall be in accordance with ASME SEC I. For pressure testing after repair or alteration, refer to SAES-D-008 and National Board Inspection Code, NB 23. Hydrostatic test during T&Is shall be in accordance with the test pressure as specified on boiler's safety instruction sheet.

Hydrostatic test for new, field fabricated heater tube assembly shall be in accordance with 32-SAMSS-029.

7.4.4 Tube bundles which have been removed from the exchanger shell for maintenance purposes shall be subjected to an in-situ shell side test per 7.4.1 prior to returning to service.

7.4.5 Fin fan exchangers shall be strength tested as specified below:

7.4.5.1 New Construction, refer to Appendix III of this standard.

7.4.5.2 Operating facilities

Strength tested in situ if the equipment has been transported.

7.5 Tanks

7.5.1 For new, field fabricated tanks, the hydrostatic testing shall be in accordance with 32-SAMSS-006 for large, low pressure welded tanks; or 32-SAMSS-005 for atmospheric steel tank.

7.5.2 For existing tanks, the hydrostatic testing shall be in accordance with 32-SAMSS-005, 32-SAMSS-006 and SAES-D-108 as applicable.

7.6 Fire Protection Systems

Pressure testing of new and existing fire protection systems shall be in accordance with SAES-B-017 and GI-1781.001.

7.7 Refrigerant Piping Systems
Refrigerant piping serving building air conditioning systems shall be tested according to the requirements of SAES-K-001 and the Uniform Mechanical Code (UMC), Section 1520 and ASHRAE Std 15, paragraph 10.

7.8 Potable Water Systems

Potable water piping inside buildings shall be tested in accordance with the requirements of the Uniform Plumbing Code (UPC). Exceptions to UPC requirements are listed in SAES-S-060.

Potable water piping outside of buildings shall be tested in accordance with the requirements of SAES-S-040.

7.9 Utility Piping Systems

Utility piping systems, including irrigation piping and water distribution mains, shall be tested in accordance with SAES-S-070.

7.10 Industrial Drainage and Sewers

Industrial drainage and sewers shall be tested in accordance with SAES-S-020.

7.11 Sanitary Sewers

Sanitary sewer systems within buildings shall be tested per requirements of the Uniform Plumbing Code (UPC). Exceptions to UPC requirements are listed in SAES-S-060.

Sanitary sewer lines outside of buildings shall be tested in accordance with SAES-S-070.

7.12 Storm Water Drainage Systems

Storm water drainage systems shall be tested per SAES-S-030.

7.13 Miscellaneous Building Services Piping

Steam and condensate piping outside the jurisdiction of ASME B31.3, heating and cooling water piping, vacuum and compressed air system piping for building services shall be tested per requirements of ASME B31.9, Building Services Piping.

7.14 Gas Cylinders

Gas cylinders shall be tested per Saudi Aramco Bottled Gas Manual.

7.15 Valves

Valves shall be tested in accordance with SAES-L-108 and 04-SAMSS-048.

7.16 Non Metallic Piping

Non metallic piping such as RTR, Thermoplastic, PVC/UPVC and CPVC shall be tested in accordance SAES-S-070.
7.17 Gasket Material

All gaskets used in the pressure test shall conform to the specifications per SAES-L-109.

7.18 Internally Coated Equipment or Piping

The hydrotest pressure of all internally coated vessels, tanks or piping shall be reviewed against the coating limitations per SAES-H-001 and SAES-H-101. On completing the hydrostatic test, the pressure should be reduced gradually to prevent decompression failure of the internal coating.

8 Preparation for Pressure Test

8.1 Site Preparation

8.1.1 An approved test procedure shall be available at the site prior to commencing any pressure testing activities.

8.1.2 New piping systems shall be cleaned in accordance with SAES-L-350.

8.1.3 Soft seated valves and control valves shall not be installed until after the lines have been thoroughly flushed.

8.1.4 Components in new piping systems which interfere with filling, venting, draining or flushing shall not be installed until after line flushing and pressure testing are completed. These include orifice plates, flow nozzles, sight glasses, venturies, positive displacement and turbine meters and other in-line equipment.

8.1.5 Pressure gauges, pressure and temperature recorders.

8.1.5.1 All gauges and recorders shall be calibrated prior to use.

8.1.5.2 The calibration interval shall not exceed one (1) month prior to the test date and calibration certificates shall be made available to Inspection personnel prior to commencement of the pressure test. Stickers shall be applied indicating the latest calibration date.

8.1.5.3 All gauges shall have a range such that the test pressure is within 30 to 80% of the full range.

8.1.5.4 A minimum of two pressure gauges are required for the test system. One pressure gage shall be on the test manifold and the other(s) on the test system. Their accuracy shall be within 5% of one another.

8.1.5.5 When large systems are tested, Inspection personnel will determine the need for additional gauges.
8.1.5.6 Pressure and temperature recording gauges shall be used for all buried piping systems on plot and per SAES-L-150 for pipelines.

8.1.6 Expansion joints and spring hangers or spring supports shall be provided with temporary restraints where needed to prevent excessive travel or deformation under the test loads.

8.2 Equipment Excluded from Pressure Test

The following list defines the equipment that shall be excluded from the in-situ pressure testing of the tested system. Also, other unlisted sensitive equipment or as designated by Saudi Aramco piping standard committee can be added:

8.2.1 Rotating machinery, such as pumps, turbines and compressors;
8.2.2 Strainers and filter elements;
8.2.3 Pressure relieving devices, such as rupture disks and pressure relief valves;
8.2.4 Locally mounted indicating pressure gauges, where the test pressure will exceed their scale range;
8.2.5 Equipment that cannot be drained;
8.2.6 Instrument Devices.

8.3 Isolation of Test Sections

Blind flanges, paddle blinds or spectacle blinds shall be used to isolate the test sections. They shall be the same class rating of the system or may be fabricated from verifiable identification of base material and approval of calculations by the Supervisor, CSD Piping Unit. When this is not practical, closed block valves (gate, globe, plug, and ball) may be used to isolate equipment or piping sections (provided the valves are not passing, otherwise the spectacle plate/blind shall be installed in the closed position). If closed block valves are used in lieu of blinds, provisions shall be made to ensure no overpressure can occur in the system that is not being tested, due to possible leak through the valves.

When a block valve is used for isolating test sections, the differential pressure across the valve seat shall not exceed the seat test pressure during pressure testing and shall not exceed the rated seat pressure during tightness test. Both sides of this valve shall be protected by relief valves during the test.

8.4 Vents and Drains

8.4.1 Vents shall be provided at all high points in the tested system as needed.
8.4.2 Excluding scrapable, submarine and buried pipelines, drains shall be provided at all low points in the system and immediately above check valves in vertical lines.
8.4.3 Unless the check valve has a by-pass valve, the disc of the check valve shall be removed, and securely attached to the outside of the check valve prior to the pressure test.

8.5 Temporary Connections and Supports

8.5.1 Temporary connections shall be provided for de-pressurizing and draining of the system to the sewer or disposal area.

8.5.2 Temporary supports shall be installed prior to hydrostatic testing, and flushing of the piping if they were determined to be required per SAES-L-150. These supports shall not be removed until after the system has been fully drained. The structural support system for stacked equipment shall be verified for hydrostatic loads prior to testing.

9 Conducting Pressure Test

9.1 The test procedures shall be conducted in accordance with the applicable code. In addition, the following requirements shall apply.

9.1.1 Filling and pressurizing shall be done on the upstream side of check valves in the system. The test fluid shall be injected at the lowest point in the system to minimize entrapped air. When filling at the lowest point is not practical, the Inspection Department/Operations Inspection Engineering Unit shall be consulted. All vents shall be open during filling.

9.1.2 No one shall approach the test area for a minimum of 10 minutes after the test pressure is reached and before commencement of inspection of the system, the isolation valve between the temporary test manifold/piping and the piping/equipment under pressure test shall be closed and the test pump disconnected. The isolation valve downstream of the manifold shall be opened after the pump is disconnected.

9.1.3 During the application of the test pressure, all in-line valves if not used as test isolation valves shall be in a partially open position.

9.2 All piping and equipment shall comply with the lay-up procedures per SAES-A-007.

9.3 Test Records shall be recorded on Pressure Test Report Form SA-2642-ENG and the applicable "Safety Instruction Sheet" per SAES-A-005.

10 Post Pressure Test

After pressure testing has been successfully completed and approved by the Owner's Inspector, the following operations shall be made.

10.1 Draining of Test Fluid
Release of pressure and draining shall be done on the downstream side of check valves. All vents shall be opened before draining to facilitate drainage and to prevent formation of a vacuum. No test fluid shall remain in low spots.

10.2 Disposal of Test Fluid
The test fluid shall be disposed in accordance with SAEP-327 or as directed by the Owner.

10.3 Test Vents and Drains
Vents and drains used only for the pressure test shall be plugged, seal welded and penetrant tested.

10.4 Removal and Reconnection of Components
All temporary items installed for testing purposes (e.g., manifolds, valves, blinds, spacers, supports) shall be removed.

Items that were removed from testing shall be reinstalled.

Items, such as instrument air tubing, check valve discs which were disconnected before testing shall be reconnected.

Isolation valves closed for the test purposes and that are required to be in the open position for process reasons shall be opened. If the valve cavity has a drain, the cavity shall be drained.

Revision Summary
14 November 2009  Major revision
14 December 2009  Editorial revision.
Appendix I – Sample Form of Request for Non-Destructive Testing
In-Lieu of Hydrostatic Test \(^{(a,b)}\)

<table>
<thead>
<tr>
<th>[ ] RT</th>
<th>[ ] AUT</th>
<th>[ ] MT</th>
<th>[ ] PT</th>
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BI/JO/WO Number: _____________________________ DATE: ______________

ORIGINATOR: _____________________________ LOCATION: _____________________________

TITLE: _____________________________

ORGANIZATION: _____________________________ ADDRESS: _____________________________ PHONE: _____________

=======================================================================================

PRESENT SITUATION: ________________________________________________________________

JUSTIFICATION: ________________________________________________________________

INSPECTION COMMENTS: __________________________________________________________

CONDITIONS OF APPROVAL: _______________________________________________________

REASONS FOR DISAPPROVAL: _______________________________________________________

CONCUR: _____________________________ RESPONSIBLE ENGINEERING GROUP

APPROVED BY \(^{(c)}\): __________________________________ FACILITY / PLANT MANAGER / SENIOR OPERATIONS’ REPRESENTATIVE

CONDITIONS:
1. Utilize skilled welders with rejection rate of less than five (5) percent on a joint basis or 0.2% on a linear basis in the most recent past twelve (12) months.
3. Visually inspect the root and cap pass during the welding process with a Saudi Aramco inspector.
4. Perform 100% radiographic testing (RT) of the butt welds.
5. Perform 100% advanced ultrasonic testing (UT; TOFD and/or Phased Array) of all welds.
6. RT and advanced UT to be interpreted by ASNT Level III personnel.

NOTES:

a. Sketch or drawing showing location of all welds to be radiographed, qualifications of the welder(s) and the approved Welding Procedure Specification shall be attached.

b. Design information such as line / equipment number, wall thickness, material, service conditions, operating pressure and temperature shall also be included.

c. Facility/Plant Manager shall approve for operating facilities and the Senior Operations’ Representative for new construction projects where a Plant Manager has not been appointed.
Appendix II – Sample of **SA-2642-Eng** Pressure Test Report Form

**SAUDI ARAMCO PRESSURE TEST REPORT**

**Reference Details:**

- **Plant Name:** ___________________
- **Plant No.:** ____________
- **BI No.:** ____________
- **Project Name:** ___________________

- **Responsible Inspection Unit:** ________________
- **Equipment Description:** _______________________
- **Location of Test:** _______________________

- **System No.:** ______
- **Purchase/Work Order No.:** _______________________
- **Letter/Diagram No.:** _______________________

- **Verbal Report To:**
  - **Name:** _______________________
  - **Position:** _______________
  - **Badge No.:** ____________
  - **Date:** _____/_____/______

**Test Details:**
- **Initial Test** [ ] **Revalidation Test** [ ]
- **Type:**
  - Hydrostatic Test [ ]
  - Pneumatic Test [ ]
  - Pre Start-up Leak Test [ ]
  - Other Method: ____________

- **Test Procedure No.:** ______
- **In Accordance with:** ____________
- **MAOP:** ____________
- **PSIG MDMT:** _____ºF
- **Test Fluid Type:** ____________

- **Test Fluid Quality:**
  - **pH:** _____
  - **SRB:** _____
  - **Oxygen Scavenger:** _____
  - **Test Pressure:** _______
  - **Test Temperature:** _____ºF
  - **Test Duration:** _______

- **Relief Valve Test Date:** _____/_____/______
- **Relief Valve Set Pressure:** _____PSIG
- **Relief Valve Tag No.:** ______

- **No. of Pressure Gauges:** _____
- **Pressure Gauge Calibration Date:** _____/_____/______
- **Pressure Gauge Range:** 0 to _____PSIG

**Flushing/Cleaning:**
- **Method Used:** ________________
- **Accepted:** [ ]
- **Rejected:** [ ]

- **Inspectors Name:** _______________________ Signature: _____________________
- **Badge No.:** ____________
- **Date:** _____/_____/______

**Lay-Up Procedure:**
- **None:** [ ]
- **Ambient Lay-Up:** [ ]
- **Wet Lay-Up:** [ ]
- **Dry Lay-Up:** [ ]
- **Other Method:** ________________

**Sketch:**


**Pressure Test Results:**

- **Accepted:** [ ]
- **Rejected:** [ ]

- **Inspectors Name:** _____________________
- **Signature:** _____________________
- **Badge No.:** ____________
- **Date:** _____/_____/______

- **Field Supervisor Name:** _____________________
- **Signature:** _____________________
- **Badge No.:** ____________
- **Date:** _____/_____/______

**Comments:**

_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
Appendix III – Fin Fan Pressure Test Decision Tree

All Fin fans stored in lay down yard and held for inspection

Visual Damage

Inspect, repair then in situ strength test

Received under positive pressure (5 to 10 psi)

Received without positive pressure (5 to 10 psi)

Pressure loss

Apply 5 to 10 psi. for min of 48 hours

Install

Engineering evaluation and root cause analysis

Repair required

Inspect, repair then in situ strength test

Connect for service

Pressure held 48 hours

Yes

Yes