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NATIONAL IRANIAN OIL REFINING & DISTRIBUTION COMPANY
NATIONAL IRANIAN OIL ENGINEERING
& CONSTRUCTION COMPANY

NIOEC SP

NIOEC SPECIFICATION FOR PLANT PIPING SYSTEMS PRESSURE TESTING

FIRST EDITION

DECEMBER, 2016

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IN THE NAME OF GOD**FOREWORD**

By their very nature, technical Specifications are continuously subject to modifications and revisions. To strengthen their merit and usefulness, continuous improvements, addendum, deletion of disparate information and consequently provision of updated revisions are to be made in order to ascertain that such Specifications meet the current requirements, inclusive of Iranian Petroleum Standards (IPS) and the recognized and acceptable national and international Standards, as well as the optimal codes and practices based on the accumulated in-house know-how and plant knowledge and experiences.

However, in reality, due to several reasons, not to mention the complexity of the matter, the ultimate goal of continuous direct embedment of the required changes on the relevant Specifications may be far reaching. Therefore, in the interim periods between the officially issued revisions, the required changes will appear in other documents related to the engineering and design work of the on going projects.

In response to the initiative of the Design and Engineering Directorate, and considering that the task of the execution of several important and mega projects for the realization of the new oil refineries, pipelines and oil terminals as well as improvements of the existing facilities, has been assigned to NIOEC, it was decided to update the NIOEC Specifications and to issue new official revisions.

The Design and Engineering Directorate was itself entrusted to carry out this important task, and as such by forming several special technical committees, working in close co-operation and cohesion and sharing their expertise and knowledge, the updated and revised NIOEC Specifications were successfully prepared and complied.

These Specifications are intended to be used for Oil Refineries, Distribution Depots, Oil Terminals, Pipelines and Pump Stations within NIOEC's projects, and have been proven to be of high value for such purposes. It must however be appreciated that these Specifications represent the minimum requirements and should in no way be interpreted as a restriction on the use of better procedures, engineering and design practices or materials.

We encourage and highly appreciate the users and other clear sighted and experts to send their comments on the Specifications to the Design and Engineering Director of NIOEC for evaluation and approval.

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NOTES:

- 1) THIS SHEET IS A RECORD OF ALL REVISIONS TO THIS SPECIFICATION.
- 2) WHEN APPROVED EACH REVISION SHALL BE CONSIDERED AS A PART OF THE ORIGINAL DOCUMENT.
- 3) NUMBER OF PAGES EXCLUDES THIS SHEET AND THE COVER SHEET.

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INTRODUCTION

To satisfy the requirements of this NIOEC Specification, Iranian Petroleum Standard IPS-C-PI-350 (JANUARY 2009) with the modifications as specified herein after shall be strictly followed.

Articles 0 through 4 of this document replace entirely the related articles in the referenced IPS Standard.

1. SCOPE

This Specification covers the minimum requirements of, field pressure test to be carried out on plant piping systems upon completion of construction work and before commissioning.

The test is required in order to prove the strength of system, its tightness (absence of leaks) and the integrity of weldments and materials.

Resolution on cases not explicitly stipulated in this Specification or on cases where conflicts may arise among the requirements of the referenced/relevant consent and approval of NIOEC.

Deviation from this specification will only be permitted on obtaining written approval from NIOEC.

2. REFERENCES

The following standard, codes and specification, to the extent specified hereinafter, shall constitute a part of this NIOEC Specification. Latest edition of the undated referenced documents and the cited edition of the dated references shall apply. The applicability of changes made to dated references, after the cited date shall be mutually agreed upon between NIOEC and vendor/contractor.

ASME (AMERICAN SOCIETY OF MECHANICAL ENGINEERING)

ASME B 31.3	“Process Piping”
ASME B 31.1	“Power Piping”
ASME B 31.5	“Refrigeration Piping”
ASME B 16.5	“Steel Pipe flanges and flanged fittings”

NIOEC-SP (NIOEC SPECIFICATIONS)

NIOEC-SP-00-10	“NIOEC Specification for Units”
NIOEC-SP-00-02	“NIOEC Specification for site Preparation-Earth Work and Sewers”
NIOEC-SP-50-02	“NIOEC Specification for General Piping Process and Utility Fabrication and Field Installation”
NIOEC-SP-50-07	“NIOEC Specification for Cleaning and Protection of Piping”
NIOEC-SP-80-17	“NIOEC Specification for Protection of Under Ground Steel Pipe”
NIOEC-SP-80-06	“NIOEC Specification for Water Quality for hydrotest”

NIOEC STANDARD DRAWINGS

NIOEC-SD-5044-1/1 “Hydro Static Test Blind”

IPS (IRANIAN PETROLEUM STANDARDS)

IPS-C-PI-350 “Construction Standard For Plant Piping Systems Pressure Testing”

2.1. Equivalent To IPS Standard

Substitute the following IPS Standards as referred to throughout IPS-E-PR-420 to relevant NIOEC's Specifications as follows:

IPS Standard
IPS-C-PI-350

Relevant NIOEC Specification
NIOEC-SP-50-05

3. UNITS

International system of units (SI) shall be used in accordance with NIOEC-SP-00-10, unless otherwise specified.

4. DEFINITIONS AND TERMINOLOGY

Pressure Rating Class Index: A pressure which is numerically equal to class index of flange.

5. MODIFICATION TO IPS-C-PI-350 (JANUARY 2009)

This addendum revises the below listed articles of the referenced standard as follows:

5. GENERAL REQUIREMENTS**5.11. (Addition)**

In addition to the requirements specified in this NIOEC Specification, piping systems shall be tested in accordance with the provisions of ASME code as follows:

- a) For process and general utility services ASME B.31.3.
- b) For piping within the scope of steam generation ASME B.31.1.
- c) For refrigeration piping system ASME B.31.5.

6. HYDROSTATIC PRESSURE TESTING**6.1. General****6.1.4. (Substitution)**

Underground lines inside plot limits shall be completely tested, inspected, drained and approved before backfilling of the lines are carried out. (See NIOEC-SP-80-17 and NIOEC-SP-00-02)

6.1.6. (Addition)

Before commencing pressure test, the construction contractor shall be provided with the following latest approved for construction document for review and compilation of test package documents and execution of the test, who shall then prepare a detailed test procedure and submit to Contractor / Employer for approval.

- a) Pressure test flow diagram.
- b) Test block list.
- c) Field pressure testing (this NIOEC Specification).
- d) Any other information as necessary.

Note: As a guide, procedure for pressure test activities of plant piping systems (including preparation of test package documents, TP flowchart, line checking, line cleaning, hydrotest, post test activities and restoration, final test package documents) in line with this NIOEC Specification is given in APPENDIX 1.

6.1.7. (Addition)

Pressure relief and thermal expansion relief valves shall be excluded from the general pressure tests. Blinds shall be installed immediately adjacent to their inlet and outlet (if required) flanges during tests. Relief valve test gags may be used in place of blinds. Screwed relief valves shall be removed and the connections temporarily plugged or capped during the tests.

6.1.8. (Addition)

Lines containing check valves shall have the source of pressure located in the piping upstream of the check valve so that pressure is applied under the seat. If this is not possible, the check valve flapper shall be removed or jacked up.

6.1.9. (Addition)

Seats of valves shall not be subjected to a pressure in excess of the maximum cold working pressure of the valve.

6.1.10. (Addition)

Short pieces of piping which must be removed to permit installation of blind or blank, should be tested separately.

6.1.11. (Addition)

Pipe supports and anchors should be fitted prior to pressure testing. In certain cases temporary or additional supporting of pipe work may be required due to weight of the testing medium.

6.1.12. (Addition)

For permanent flanged joints, permanent service gaskets shall be used. For temporary flanged joints, test gasket shall be used. Record of such temporary gaskets, shall be maintained.

6.1.13. (Addition)

Wherever practical these lines shall be hydro tested at grade before erection and connecting joints of different parts shall be radio graphically tested after Employer's approval.

6.1.14. (Addition)

All A/G lines shall be tested prior to insulation; lines may be painted except weld joints, screwed or flanged joints. All U/G lines shall be tested after coating and wrapping except weld joints

6.4. Test Medium**6.4.1. General (Substitution)**

For more information about test medium quality shall be seen NIOEC Specification (NIOEC-SP-80-06)

6.5.1. General Process Piping-Test Pressure (Modification)

The minimum hydrostatic test pressure shall be 7 bar(g)

d) (Addition)

Where the pipe work being tested contains flanges, the test pressure as determined in paragraph 6.5.1 (b) for piping should be in accordance with section 8 of steel pipe flanged fittings, ASME B 16.5.

6.5.5. Jacketed Lines-Test Pressure (Substitution)

In jacketed lines the jacket shall be tested in accordance with paragraph 6.5.1 on the basis of jacket design pressure. The internal line shall be tested on basis of external or internal design pressure whichever is greater, unless limited by the engineering design conditions. Limitations shall be noted on the pressure test flow diagram.

6.7.6. (Substitution)

All valves (except block valves of tracers and instruments) shall be completely open during the test.

6.7.23. (Addition)

Steam traps shall be removed before pressure testing

6.8.4. (Substitution)

Filling shall be done from lowest point of the loop and test pressures shall be taken at the lowest point of a line or test system.

6.8.9. (Substitution)

All plain test blanks required for field testing shall be provided and/or made in the field according to NOEC-SD-50-01. Procurement of required material is in contractor's scope of supply

6.8.10. (Addition)

If the test pressure is the same upstream and downstream of a control valve, the block and by-pass valves shall be left open, with the control valve open or closed (whichever is most convenient).

6.8.11. (Addition)

If the test pressure is different at upstream and downstream of a control valve, the test on the upstream portion shall be made with the upstream block valve and control valve open, downstream block valve and by-pass valve open and blinded off.

6.10. Leaking Welds (Addition)

Welds or portions of welds that leak during hydrostatic test shall be cut out, rewelded, radiographed and line shall be hydrostatically tested again at the construction contractor's expense.

6.12. Specific Case of Closure Welds (Golden welds) (Addition)

Final butt welds connecting components which have been successfully tested may not be pressure tested provided it is demonstrated that pressure test cannot be practically performed.

This clause is only applicable to a connection of a straight length of tube to another straight length of pipe. A minimum distance of 3D or 1000 mm shall be maintained between two successive closure welds. This is not acceptable for connection welds onto fittings and for T-butt welds.

A list of these welds (including line tag number, rating, diameter, fluid...) shall be prepared and submitted to Company for approval before any welding activity take place.

Each weld shall be in-process full time examined for good workmanship practice and compliance with qualified welding procedure specification (WPS). Examination shall comprise as a minimum:

- Joint preparation and cleanliness
- Preheating
- Fit-up, joint clearance and internal alignment prior to joining
- Compliance with variables specified by WPS
- Condition of root pass after cleaning aided if necessary by MPI or DPI examination
- Slag removal and weld condition between passes
- Appearance of the finished joint.

Each closure weld shall successfully pass a 100% DPI or MPI surface examination and a 100% radiographic examination and 100% ultrasonic examination in accordance with the requirements of paragraph 9 above. Company shall be notified before any welding activity commences on any such weld.

7. PNEUMATIC PRESSURE TESTING**Caution (Addition)**

Pneumatic testing is potentially hazardous, due to the possibility of sudden release of considerable stored energy. It is therefore important that the precautions described in this document are complied with. However, compliance with this specification does not relieve the Contractor of his responsibilities under the local regulations

7.5.4. (Substitution)

All butt welds of piping subjected to pneumatic strength test above 150 psig shall be 100% radiographed and 100% magnetic particle or dye examination of all other attachment welds

7.6. Pneumatic Testing Procedure (Modification)

Add the following sentence at the end of paragraph:

Testing shall not take place in rain or if the ambient temperature is below 5°C. If possible, testing should not be undertaken when the weather conditions may give rise to large temperature fluctuations in a short time. The schedule for testing shall preferably be arranged accordingly, particularly for large test assemblies.

After evacuation of all personnel from the test area, air shall be slowly admitted to the test assembly until the pressure attains the lesser of one-half of the required test pressure or 1.5 barg.

All joints, flanges and welds shall be tested by applying the soapy water. Flanged joints and any weld areas which may be difficult to inspect may be tested by wrapping with a suitable adhesive tape and applying the soap solution to a pin-hole in the tape. The tape shall not be pressed down on to the weld.

The test assembly shall be held at this preliminary pressure for sufficient time to permit a thorough inspection of all joints, flanges and welds to determine the location of any leaks. If any leaks are found, the test shall be aborted and the leaks repaired before recommencing the test.

The test assembly shall not be subjected to any shock loading, such as a hammer testing.

If no leaks are found at this stage, the pressure shall be slowly increased in increments of approximately 1 bar. The pressure shall be held for sufficient time at each stage to permit piping strains to equalize.

When the required test pressure is attained, the test assembly shall be isolated from the air source (but not from the relief valve) and the pressure shall be held for 20 minutes to observe any fall in pressure indicative of a major leak. Consideration shall be given to the effects of ambient/metal temperature changes during this period. Personnel shall not approach the test assembly at this stage or during pressurisation. Monitoring of pressure and temperature shall be made from a remote location.

If no leaks are indicated at the test pressure, the pressure within the test assembly shall be slowly released, down to the atmospheric pressure.

Pressure shall be released by means of a suitable valve. Pressure release shall not be achieved by loosening of flange bolts or plugs or via a line ball valve or gate valve. Care shall be taken to avoid metal temperatures falling below 0°C, particularly near the vent connection during depressuring.

8. REPAIRS (Modification)

Add the following sentence at the end of paragraph:

If any leaks are found in a welded joint, they shall be repaired (after depressurization) using an approved weld repair procedure and proved acceptable by radiographic testing prior to repeating the pneumatic test.

Any leaks at flanged joints shall be investigated prior to remedial action. Care shall be taken not to apply excessive torque to bolting to achieve a leak-tight seal.

Following repair of any leaks, the full pneumatic test procedure of Section 5 shall be followed in repeating the test.

9. MANUFACTURING CERTIFICATE FOR PREFABRICATED PIPING (Modification)

Add the following sentence at the end of paragraph:

Following successful test, the Contractor shall provide a test certificate for each test assembly.

The appropriate authorisation form and the permanent pressure/temperature recordings shall be attached to each test certificate. Any previous leaks and their causes shall be noted upon the final test certificate. The Contractor shall report any undue flexing, distortion or banging which may have occurred during testing.

Completed test certificates shall be incorporated into the final documentation for submission to the Client.

10. DOCUMENTATION REQUIREMENTS (Substitution)

Test procedures, documents, reports and test results (one original + 1 copy) shall be submitted to employer on completion of tests and prior to start up of unit. Test record documents shall be as follows:

10.1. Piping Installation (Substitution)

Test record documents shall include the following completed and signed final documents/ reports which are prepared gradually as the fabrication/ erection activities progresses and finally compiled as "Test Package Documents". (Original + 1 Copy shall be submitted to Employer)

(See Appendix 1)

- a) Test package content.
- b) Piping test package cover sheet.
- c) Marked up test flow diagram to show test circuit and test block list.
- d) As built ISO drawing or/and QC (Quality Control) ISO drawings with bill of materials.
- e) Piping spool shop fabricated inspection report. (if applicable).
- f) NDT/PWHT completion report.
- g) Line checks report.
- h) Punch list (prepared by construction contractor).
- i) Punch list (prepared by contractor/ employer as applicable).
- j) Pad test report, as required.
- k) Orifice flange inspection report as required.

- l)** Inspection report for line cleaning.
- m)** Pressure gauge calibration report.
- n)** Test medium laboratory test report, as required.
- o)** Pressure test report.
- p)** Post test inspection and restoration report.

APPENDIX 1 (Addition)**(Guide for Piping Pressure Test Activities and Compilation of Test Package Document)****13. SCOPE (Addition)**

As a guide, this procedure covers pressure test activities of piping system including preparation and compilation of test package documents, TP flow chart, line checking, line cleaning, hydrotest, post test activities and restoration, final test package documents in line with this NIOEC Specification.

13.1. Documentation

Prior to the test Employer/ Contractor will provide for Construction Contractor the following latest approved construction documents for review and compilation of the test package document and execution of the test.

- a) Pressure test flow diagrams.
- b) The block list for process unit.
- c) Field pressure testing specification.
- d) Any other information as necessary.

13.2. Preparation of Test Packages

After completion of installation and preparation of scaffolding Construction Contractor shall proceed with preparation of test package document for each test section and submit these to Employer/ Contractor 3 weeks prior to the test.

The test package documents shall include the following information inserted in relevant columns and signed by Construction Contractor.

- a) Test package contents
- b) Piping test package cover sheet
- c) Marked up test flow diagram to show test circuit and test block list
- d) As built ISO drawing or/and QC ISO drawings with bill of materials
- e) Piping spool shop fabricated inspection report
- f) NDT/PWHT completion report
- g) Line check report
- h) Punch list – A (A1 for welding, A2 mechanical) prepared by Construction Contractor
- i) Punch list – B (B1 for welding, B2 for mechanical) prepared by Employer/ Contractor
- j) Pad test report as required
- k) Orifice flange inspection report as required
- l) Inspection report for line cleaning
- m) Pressure gauge calibration report
- n) Pressure test report
- o) Post test inspection and restoration report

The test package will be reviewed by Employer/ Contractor and then return it to Construction Contractor.

13.3. Test Scheduling

Construction Contractor will prepare test schedule in coordination with Contractor on a weekly basis. Test schedule shall include due dates for different stages of test preparation, i.e.

line checking punch listing, rectification of punch items, preparation and execution of line cleaning test, dry out and restoration. Copies of test schedule shall be distributed by Construction Contractor to the relevant parties.

13.4. Line Checking by Contractor, Employer and Construction Contractor

NOTE: Line checking may be executed jointly or separately, as agreed; however Construction Contractor shall proceed his initial line checking & rectifies all deficiencies prior to requesting Employer/ Contractor for line checking.

All mechanical / functional line checking as shown below is normally performed and related punch list would be prepared and issued to Construction Contractor within one week.

Construction Contractor shall provide suitable access/platforms for thorough inspection of lines before submission of test package which remain up to the end of hydrotest completion and restoration. Rectification of punch items will be followed and finally the related punch list forms and line check report will be signed by concerned parties.

A: Mechanical Line Check after Erection.

A.1. Conformity of installed line configuration with piping plan, ISO drawings and P&ID:

- 1.1.** Location / Dimension / Elevation of piping.
- 1.2.** Verticality / Levelness / Straightness.
- 1.3.** Line Slope per Drawing.
- 1.4.** Reducers Type and Location.
- 1.5.** Installation of Orifice Flange.

A.2. Conformity of materials with ISO drawings bill of material:

- 2.1.** Line size.
- 2.2.** Pipe and fittings material.
- 2.3.** Bolt tension (if specified) and correct length.

A.3. Branches:

- 3.1.** Branches located correctly.
- 3.2.** Type of branch is in accordance to NIOEC Specification for piping material NIOEC-SP-50-04.
- 3.3.** Branch reinforcement pad and weep holes.
- 3.4.** Gussets installed, where required.

A.4. Gasket installation:

- 4.1.** Type, material, thickness.

A.5. Conformity of pipe supports with isometric drawings and removal of temporary supports:

- 5.1. Anchors installed.
- 5.2. Guides installed.
- 5.3. Proper shoes installed and welded.
- 5.4. Spring hangers / supports and their block pins, installation and correctness of item code number.

A.6. NDT check:

- 6.1. Welding completed and all NDT (RT, PT, MT, and Hardness) requirements have been completed satisfactorily and records are available.
- 6.2. Post weld heat treatment (if any) have been done satisfactorily and records are available.
- 6.3. Final inspection of the line and weldment for possible damages, weld spatter, arc strikes, and any other deficiencies.

B: Functional line checking:

1. Conformity to all requirements in latest P&ID.
2. Requirement of operational drain / vent.
3. Operability.
4. Accessibility / maintenance.
5. Readable requirements of instruments.
6. Checking of Supports, stoppers, guides, including cold offset setting from thermal stress view point.
7. Spring hanger / support installation and settings.
8. Other general piping engineering matters.

Punch item which do not require line modification / cutting / welding and have no effect on pressure testing, may be rectified at later stage. Construction contractor shall provide the list of such items and their estimated completion date.

13.5. Preparation for Line Cleaning and Hydrotest

1. Line cleaning / water flushing procedure and pressure test procedure (identifying cleaning method, test equipment, facilities, pressurizing rate, safety precaution, location of gauges, point(s) of filling and drainage, vents, etc, marked up on test flow diagram) shall be submitted by Construction Contractor to Contractor and Employer for review and acceptance.

Note: Some lines such as seal oil/ lube oil, compressors suction line, etc. require chemical cleaning. Such chemical cleaning shall be done after completion of normal cleaning, hydrotest and prior to start up as per NIOEC-SP-50-07.

2. For pneumatic test, separate procedure with safety precaution consideration as required in ASME B31.3 and this NIOEC Specification shall be prepared and submitted for review and acceptance.

3. Preparation for line cleaning and hydrotest will be checked by Contractor and Employer's inspector, and then punch list(s) (if any) will be issued.

Construction Contractor shall notify Contractor and Employer by issuing application for inspection, both for line cleaning and pressure test date.

13.6. Line Cleaning

1. Precaution should be taken to ensure that debris is not flushing into vessels, equipment, pumps, etc., while executing line cleaning / flushing.
2. During cleaning / flushing stage, parts such as PSV, control valves, thermo wells, strainer element, orifice plates, and all instruments shall not be installed or somehow exempted. When pre-test cleaning / flushing is completed, control valve, thermo well, strainer element, level instrument, and expansion joints of sliding sleeves* shall be installed and included in the test as required.

* For expansion joint Employer and Contractor confirmation required.

3. Line cleaning / Water flushing shall be witnessed by Contractor and Employer and the corresponding report shall be prepared and signed.

13.7. Pressure Test

Requirements of this NIOEC Specification shall be strictly followed. All pressure testing will be witnessed by Contractor and Employer inspector and upon satisfactory completion of the test, the pressure test report will be signed by concerned parties.

Checking prior and during test are not limited to those described below requirements of field pressure testing specification shall be followed, however, following check items are highlighted as guidelines only:

1. Verify chloride content and PH of test water prior to release of water to Construction Contractor for testing of austenitic stainless steel lines or components (maximum chloride content shall not exceed 40 PPM; laboratory test report is required.)
2. Pressure source and gauge shall be upstream of check valves, if pressure source is downstream, check valve should have flapper removed or jacked up. Pressure must be released downstream the check valve after test completion.
3. Where soft seated ball valves are in line and located at the end of test section, the pressure side of the line at ball valve flange shall be blinded, if such ball valve is within the line being tested it shall be in the fully open position.
4. If the test pressure is the same upstream and downstream of a control valve, the block and by-pass valves shall be left open, with the control valve in open or closed position.
5. If the test pressure is different at upstream and downstream of a control valve, the test on the upper stream portion shall be made with the upstream block valve and control valve open. Down stream block valve and by-pass valve open and blinded off.
6. Seats of valves shall not be subjected to a pressure in excess of the maximum cold working pressure of the valve.
7. For permanent flanged joints, permanent service gasket shall be used, for other temporary flanged joints test gasket shall be used. Record of such temporary gaskets shall be maintained.

8. Test blinds shall be of correct thickness with handle painted red, a record should be kept showing the location of test blinds to ensure their removal at the test completion.
9. Verify location of test gauges and suitability of the pressure gauge range and its division (Range should be 1.5 to a maximum of 2 times of the test pressure and accuracy of division to be 1%). See attached table
10. The test gauges shall be calibrated and calibration certificate available.
11. Pipe supports and anchors shall be fitted prior to pressure testing.
12. Additional supporting of pipe work may be required due to weight of testing medium.
13. When conditions require that a pressure test be maintained for a period of time during which the testing medium in the system would be subject to thermal expansion, provision should be made for relief of excess pressure.
14. During hydrotesting, care must be exercised to limit the applied pressure to the particular portion of the system designated on the field pressure test flow diagram.
15. Short pieces of piping which must be removed to permit installation of blind or blank should be tested separately.
16. Each test shall be held for 60 minutes without any loss of pressure prior to requesting inspector to witness the test.

13.8. Post Test Activities and Restoration

After completion of hydrotesting, followings to be executed:

1. All lines shall be completely drained; care shall be exercised in controlling the rate of water drain in respect to inflow of air through the vents to ensure that vacuum is not applied.

CAUTION: Prior to commencing drainage, ensure that all vents are open with plugs and blind flanges removed.

2. Remove all temporary blanks and blinds.
3. Dry out austenitic stainless steel lines and other carbon steel piping where acid forming process could be involved.
4. Remove temporary supports and temporary testing connection.
5. Remove temporary gaskets for hydraulic test and install proper service gaskets.
6. All piping components shall be reinstalled except the followings:
 - Orifice plates.
 - PSV.
 - Instrument component (such as PG restriction orifice, etc.).
 - Spring hanger set pin or spring support stop pin shall not be removed.
7. After hydrostatic/pneumatic leak testing seal welding of threaded joints is necessary in accordance with requirements of Piping Material Specification (NIOEC-SP-50-04)

13.9. Final Test Package Documents

Records shall be made of the completed and signed final test package documents (listed in item 12.2).

Original of final test package documents plus one copy shall be submitted to Employer.

NATIONAL IRANIAN OIL ENGINEERING AND CONSTRUCTION COMPANY		REPORT NO.:	
PROJECT:		JOB NO.	SH... OF...
Contractor:	Construction Contractor:	UNIT ITEM. NO.	

TYPE OF PIPING PRESSURE TESTING

TEST TYPE	TEST MEDIUMS	APPLIED (As per Test Block Dia.)	WORK SEQUENCE
HYDROSTATIC	Water * For SS/HA piping Max. Cl. 40 ppm	General	CASE-1 (Base Case) CASE-2 (When app. by NIOEC) Line checks/ Punch out Line cleaning Press. Test Press. Test Line cleaning Dry out Restoration
			CASE-1 (Base Case) CASE-2 (When app. by NIOEC) Line checks/ Punch out Air blowing Press. Test Press. Test Air blowing Restoration
IN SERVICE	Service Fluid	Only Approved by NIOEC	Line checks/ Punch out Flushing/ Blowing Service test Restoration

Note for line cleaning

For large diameter piping hand wipe/ sweep should be applied as much as possible (inspection to be recorded).