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Technical Requirements Specification

Technical Specification for Roughing Pump System (RPS) Pipe Support Fabrication

Technical Specification for the fabrication of steel pipe supports for Roughing Pump System (RPS), outlining requirements for materials, welding operations, coating, inspection, and acceptance criteria.

Approval Process			
	Name	*Action*	*Job Title / Affiliation*
Signatory	**SMITH III C.**	**14 Oct 2025:signed**	**WBS Manager for Vacuum Systems and ...**
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Change Log			
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Version	***Latest Status***	***Issue Date***	***Description of Change***
v1.0	Revision Required	15 Sep 2025	
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Technical Specification for Roughing Pump System (RPS) Pipe Support Fabrication

Abstract or description:

Technical Specification for the fabrication of steel pipe supports for Roughing Pump System (RPS), outlining requirements for materials, welding operations, coating, inspection, and acceptance criteria.

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1. INTRODUCTION

ITER is an international research project with a programmatic goal of demonstrating the scientific and technological feasibility of fusion energy for peaceful purposes. The ITER device is being designed by the European Union, India, Japan, the People's Republic of China, the Republic of Korea, the Russian Federation, and the United States. The European Union is the host party for the ITER facility which is being constructed in Cadarache, France. The ITER Organization Central Team (IO) is responsible for the final design, performance parameters, procurement specifications, schedules, integration management, systems engineering, and component assembly, installation, testing, and commissioning. Governing regulations, codes, and standards for the design and construction of all ITER components are determined by the European Union and France. The US portion of ITER is managed by the US ITER Project Office (USIPO) which is hosted by Oak Ridge National Laboratory (ORNL) under contract with UT-Battelle (hereinafter referred to as the "Company"), and located in Oak Ridge, Tennessee. Responsibility for operating the completed ITER facility will belong to the IO.

2. SCOPE

This specification defines the material, fabrication, inspection, examination, testing, certification, packing, and shipping requirements for the fabrication of the Roughing Pump System (RPS) pipe supports for the ITER research facility being constructed in Cadarache, France. Pipe supports covered in this specification have been designed and analyzed under the responsibility of the USIPO and consist primarily of carbon steel structural sections assembled as required to provide the needed restraint to the piping manifolds. Commercially available support components such as pipe clamps, U-bolts, and slide plates are also used. Additionally, when specified in the support drawings, stainless steel lugs shall also be supplied for field weld to the piping upon delivery.

The supports are subject to ANSI/AISC N690 [3.1.2]. Adherence to this technical specification assures that the supports shall conform to the requirements for Quality Classification 1 (QC-1) and Safety Important Classification 1 (SIC-1), to ensure fabrication, surveillance, and performance requirements. All applicable drawings under the scope of this Technical Specification are listed in the List of Roughing Pump System (RPS) Pipe Support Drawings [3.2.1].

3. APPLICABLE DOCUMENTS (CODES AND STANDARDS AND REFERENCES)

Unless otherwise specified, the correct revisions of National and International Standards, US ITER technical documents, drawings, specifications, and other job-related documents will be identified on the Current Reference List (CRL) for Roughing Pump System (RPS) Pipe Support Fabrication (808a9a95, ITER_D_EP735H).

3.1 List of Applicable Codes and Standards

3.1.1 AISC 348, *RCSC Specification for Structural Joints Using High-Strength Bolts*

3.1.2 ANSI/AISC N690, *Specification for Safety-Related Steel Structures for Nuclear Facilities*

3.1.3 ANSI/MSS SP-58, *Pipe Hangers and Supports – Materials, Design, Manufacture, Selection, Application, and Installation*

3.1.4 ASTM Standards

3.1.4.1 ASTM A240/A240M, *Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications*

3.1.4.2 ASTM A36, *Standard Specification for Carbon Structural Steel*

3.1.4.3 ASTM A500, *Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes*

3.1.4.4 ASTM A529, *Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality*

3.1.4.5 ASTM A572, *Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel*

3.1.4.6 ASTM A992, *Standard Specification for Structural Steel Shapes*

3.1.4.7 ASTM D4285, *Standard Practice for Indicating Oil or Water in Compressed Air*

3.1.4.8 ASTM D4417, *Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel*

3.1.4.9 ASTM D4541, *Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers*

3.1.4.10 ASTM E164, *Standard Practice for Contact Ultrasonic Testing of Weldments*

3.1.4.11 ASTM E94, *Standard Guide for Radiographic Examination Using Industrial Radiographic Film*

3.1.4.12 ASTM E2445, *Standard Practice for Performance Evaluation and Long-Term Stability of Computed Radiography Systems*

3.1.4.13 ASTM E2698, *Standard Practice for Radiographic Examination Using Digital Detector Arrays*

3.1.5 AWS D1.1, *Structural Welding Code – Steel*

3.1.6 AWS D1.6, *Structural Welding Code – Stainless Steel*

3.1.7 EN 10204, *Metallic Products - Types of Inspection Documents*

3.1.8 ISO Standards

3.1.8.1 ISO 13920, *Welding – General tolerances for welded constructions – Dimensions for lengths and angles, shape and position*

3.1.8.2 ISO 17636-2, *Non-destructive testing of welds — Radiographic testing — Part 2: X- and gamma-ray techniques with digital detectors*

3.1.8.3 ISO 17640, *Non-destructive testing of welds — Ultrasonic testing — Techniques, testing levels, and assessment*

3.1.8.4 ISO 19840, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Measurement of, and acceptance criteria for, the thickness of dry films on rough surfaces*

3.1.8.5 ISO 2553, *Welding and allied processes – Symbolic representation on drawings – Welded joints*

3.1.8.6 ISO 2768, *General tolerances*, Parts 1 and 2

3.1.8.7 ISO 8501-1, *Preparation of steel substrates before application of paints and related products – Visual assessment of surface cleanliness – Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings*

3.1.8.8 ISO 8501-2, *Preparation of Steel Substrates Before Application of Paints and Related Products - Visual Assessment of Surface Cleanliness - Part 2: Preparation Grades of Previously Coated Steel Substrates After Localized Removal of Previous Coatings*

3.1.8.9 ISO 8502-3, *Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness — Part 3: Assessment of dust on steel surfaces prepared for painting (pressure sensitive tape method)*

3.1.8.10 ISO 8502-6, *Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness — Part 6: Extraction of water soluble contaminants for analysis (Bresle method)*

3.1.8.11 ISO 8503-1, *Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates — Part 1: Specifications and definitions for ISO surface profile comparators for the assessment of abrasive blast-cleaned surfaces*

3.1.8.12 ISO 9606-1, *Qualification testing of welders - Fusion Welding - Part 1: Steels*

3.1.8.13 ISO 9712, *Non-destructive testing – Qualification and certification of NDT personnel*

3.1.9 NACE AMPP SP0188, *Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates*

3.1.10 SSPC Standards

3.1.10.1 SSPC-PA 2, *Procedure for Determining Conformance to Dry Coating Thickness Requirements*

3.1.10.2 SSPC SP 1, *Solvent Cleaning*

3.2 References

3.2.1 List of Roughing Pump System (RPS) Pipe Support Drawings, (EDRM 808e1ad6, ITER_D_EV53KE)

4. TECHNICAL REQUIREMENTS

4.1 Materials

4.1.1 General Requirements

1. Structural carbon steel shall conform to the ASTM specifications listed on the design drawings in the List of Roughing Pump System (RPS) Pipe Support Drawings [3.2.1]. Structural carbon steel cross-listed with a European EN standard in addition to an ASTM standard should be used when available. All materials shall be accompanied with a material certification in conformance with Type 3.1 of EN 10204 [3.1.7].
2. Unless specified otherwise on the design drawings, the following ASTM specifications shall be used:
   a. Wide flange members shall meet ASTM A992 [3.1.4.6].
   b. HSS Members shall meet ASTM A500 [3.1.4.3] Grade B; Grade C is an acceptable substitute.
   c. All plate material shall meet ASTM A36 [3.1.4.2].
   d. Pipe Lugs shall meet ASTM A240 TP 304L [3.1.4.1].
3. All components shall have mill certifications for each individual heat of material used to provide traceability.

4.1.2 Commercially Available Support Components

Commercially available support components shall conform to ANSI/MSS SP-58 [3.1.3]. With prior approval of the Company, products equivalent in form, fit, and function may be substituted for commercially available support components specified on the design drawings. Where applicable, commercial grade (e.g. ASTM specified) components maybe used in place of nuclear grade (ASME specified) components, if the capacity of the two components can be shown to be equivalent. Vendor shall provide documentation of load capacity for any commercially supplied components. Additionally, commercially available components shall be supplied with a Type 2.1 certificate of conformance per EN 10204 [3.1.7].

4.2 Construction, Fabrication, and Assembly

4.2.1 General

1. Support construction shall be in compliance with the technical drawings of record shown in the List of Roughing Pump System (RPS) Pipe Support Drawings [3.2.1].
2. Construction shall be conducted in accordance with ANSI/AISC N690 [3.1.2].

4.2.2 Welding

1. Welds shall be as shown on the technical drawing of record. Weld symbols shall be interpreted in accordance with ISO 2553 [3.1.8.5].
2. Structural welding shall be done in accordance with AWS D1.1 [3.1.5] or AWS D1.6 [3.1.6] where applicable.
3. Personnel shall be qualified as required by the selected and agreed upon code. Qualifications shall be, at a minimum, equivalent to ISO 9606-1 [3.1.8.12] for welders and ISO 9712 [3.1.8.13] for non-destructive examiners and provided in the welding dossier.
4. All welding shall be performed using E70XX (70 ksi / 482 MPa nominal tensile strength) electrodes for carbon steel welding, unless otherwise specified on the support drawing.
5. Traceability should exist between the support and the weld rod used for fabrication.
6. For weld inspection requirements, see Section 5.2.1 of this specification.
7. Where welding of carbon steel supports is required near stainless-steel components (i.e., piping, supports, equipment, etc.), the stainless-steel components shall be protected during preparation, execution, and post-welding operations (i.e., grinding, cleaning, examination, etc.) of carbon steel. Protection may be accomplished by, but not limited to, use of welding fire blankets.
8. Where carbon steel and stainless steel are to be welded together, AWS D1.6 shall be followed [3.1.6]. Electrodes shall be as indicated on the drawings or in AWS D1.6.

4.2.3 Hollow Structural Sections (HSS)

1. Seal-welding, that causes the pipe support to form a closed volume, shall be avoided. A vent hole is an acceptable means of preventing a closed volume.
2. Openings to be closed during field installation welding shall be temporarily capped or covered to prevent ingress of moisture or foreign objects.

4.2.4 Approved Material Substitutions

1. Where ASTM A992 steel is specified [3.1.4.6], ASTM A572 Grade 50 [3.1.4.5] or ASTM A529 [3.1.4.4] may be substituted, if resulting substitution results in a cost or schedule improvement.
2. Where ASTM A500 [3.1.4.3] Grade B is specified, Grade C may be substituted.

4.2.5 Bolts, Nuts and Threaded Fasteners

1. Unless shop installation is indicated, bolts, nuts, and other threaded fasteners are intended for field assembly or adjustment and do not need to be installed by the Seller. However, all such fasteners shall be provided by the Seller unless marked on the design drawings as "For Reference Only."
2. Any shop-installed threaded fasteners shall be installed to the specified torque or pretension using a calibrated torque wrench. Fasteners with no torque or pretension indicated shall be installed snug-tight. All threaded joints shall be made in accordance with AISC 348 [3.1.1]. Any shop-installed stainless-steel threaded fasteners shall be lubricated with Bostik Never-Seez High Temperature Stainless Nuclear Grade or approved equivalent.

4.2.6 Spares

Spare pipe lugs shall be fabricated according to the dimensions specified in the support drawings. Each pipe lug must be individually bagged, with the bag clearly labeled with the Lug PNI.

4.3 Surface Coating

4.3.1 Surface Preparation

1. Perform air compressor oil and water contamination test - Blotter Test as per ASTM D4285 [3.1.4.7].
2. Round sharp edges of sheared members in accordance with ISO 8502-3 [3.1.8.9] requirements to achieve a minimum radius of 2 mm. Prior to abrasive blasting, brush welds to remove weld slag, weld spatter, and foreign matter from surfaces in accordance with Grade P3 of ISO 8501-2 [3.1.8.8]. Grind welds smooth as needed.
3. Surface preparation and coating operations must be sequenced to prevent freshly applied coatings from being contaminated by dust or foreign matter. All surface contaminants, including oil and grease, must be removed in accordance with SSPC-SP 1 [3.1.10.2] before the surface is prepared and protective coatings are applied. Degreasing may be performed using solvent cleaning, detergent washing, or steam cleaning. All steel abrasive blast cleaned during the work shift must be primed within that same work shift. Prepared steel not protected within the same work shift shall be re-blast cleaned prior to coating.
4. Where carbon steel is welded to stainless steel, mask weld as needed to ensure that the carbon steel is fully coated while the stainless steel remains free of any coating.

5. Abrasive blast clean the surface to a minimum grade of Sa 2½ per ISO 8501-1 [3.1.8.7]. Blast with an angular abrasive to achieve an anchor profile of 38 -100 pm (1.5 - 4.0 mils) as indicted by a Keane-Tator Surface profile Comparator or Testex Tape in accordance with ASTM D4417 [3.1.4.8].

4.3.2 Coating Specifications

1. Coating specified: PPG Amerlock 400 NT or equivalent with TPO approval
2. Color: un-tinted White Base AK400N3
3. First Coat Thickness: The average Dry Film Thickness (DFT) for the 1st coat is to be a minimum of 125 µm (5 mil).
4. Final Coat Thickness: The final average DFT shall be verified to be, at a minimum, 225 µm (9 mil).
   a. The arithmetic average of all individual measurements must be equal or greater than the nominal value of the dry film thickness NDFT.
   b. Individual readings shall be not less than 80% of the minimum value specified by the NDFT.
   c. For each inspected area, only 20% of the individual readings are permitted to be between 80% and 100% of NDFT.

4.3.3 Coating Application Prerequisites

1. The storage of paints and thinners shall be done strictly in the original container, in ventilated areas with temperatures in the range indicated in the manufacturer's technical data sheet. The containers must bear the label with the batch number of the paint and their expiration date. The use of expired products is strictly prohibited. In case of two-component substances, the parts must be mixed by weight or volume, strictly according to the proportions indicated in the technical data sheet
2. Surface temperature during application should be between 10°C (50°F) and 50°C (122°F).
3. Surface temperature during application should be at least 3°C (5°F) above dew point.
4. Coating temperature during application should be between 10°C (50°F) and 32°C (90°F).
5. Ambient temperature during application and curing should be between 10°C (50°F) and 50°C (122°F).
6. Relative humidity during application should be above 0% and below 85%.
7. Surface dust testing shall be conducted in accordance with ISO 8502-3 [3.1.8.9] to ensure that all dust and abrasive residue have been effectively removed.
8. Chloride Testing using the Bresle Patch Method of ISO 8502-6 [3.1.8.10] shall be performed, with an acceptable limit of less than 3 µg/cm². If test results show chloride levels exceeding this limit, the surface shall be re-cleaned using solvent cleaning and, if necessary, high-pressure water jetting.

9. Area should be sheltered from airborne particulates and pollutants.
10. Ensure good ventilation during application and curing.
11. Provide shelter to prevent wind from affecting spray patterns.
12. Avoid combustion gases or other sources of carbon dioxide that may promote amine blush and ambering of light colors.

4.3.4 Coating Application Procedure

1. All external carbon steel surfaces shall be coated in accordance with this section.
2. For coatings that are applied after final machining, tapped holes shall be protected from coating. Threaded connection interfaces shall be inspected after coating to ensure no damage or other adverse effects to threads. Threaded holes to be coated with a thin layer of Krytox LVP grease to prevent the rusting of exposed carbon steel threads.
3. Mix and apply the coating in according to the manufacturer's instructions.
4. Pre-mix base component with a pneumatic air mixer at moderate speeds to homogenize the container.
5. The proper mixing ratio by volume between the base and the hardener is 50:50 (1:1).
6. Add hardener to base and agitate with a power mixer for 1-2 minutes until completely dispersed, in a manner that does not introduce air into the mixed coating.
7. The addition of any coating drying accelerator is not permitted.
8. Use brushes to work coatings thoroughly into joints, rough welds, crevices and around rivets and bolts. Pay special attention to cutouts, sharp edges, and irregular surfaces to ensure complete coverage and recommended thickness.
9. Measure the dry film thickness after each coat in accordance with SSPC-PA 2 [3.1.10.1]. Make all measurements with a Type 2 gauge having an accuracy of 3 percent or better.
10. Ensure the coating thickness after each coat meets the requirements shown in Section 4.3.2. Correct areas of noncompliance by adding additional coating or mechanically removing the excess coating prior to the application of the next coat.
11. Ensure that any surface of the coated support that will be in contact with stainless steel piping is free of defects such as chips, scratches, or exposed areas of carbon steel. For the associated coating testing and inspection, see Section 5.2.3

4.4 Nameplate and Product Marking

1. Each pre-manufactured sub-assembly making up a support (excluding hardware) shall be marked using the ITER Part Number Identifier (PNI) and support name. The support names are shown on the List of Roughing Pump System (RPS) Pipe Support Drawings [3.2.1] and have a format such as the example (31SV00-ZJ-xxxx).

2. Pipe supports shall be permanently identified either by engraving or by using a 12-to-14-gauge 304 stainless steel tag, in accordance with the drawing requirements. The identification shall be in Arial font, with a minimum size of 20 pt (approximately 7 mm). The nameplate shall be permanently affixed after the final coating is applied, using 18-8 stainless steel rivets, 1/8 inches in diameter, to ensure secure attachment during normal operation. If the hollow structural section (HSS) wall thickness prevents the use of rivets, alternative fastening methods shall be approved by the Technical Project Officer (TPO). Whenever possible, the nameplate should be installed in a visible location that remains accessible after the pipe support and associated piping are installed. The final identification method and installation location shall be subject to approval by the TPO.
3. Bagged hardware shall be clearly marked with the hardware PNI.

5. QUALITY ASSURANCE PROVISIONS

5.1 Acceptance Criteria

For acceptance of the final product to occur, all requirements of this technical specification and its referenced drawings shall be demonstrated to be satisfied with sign-off approval by US ITER prior to shipment.

5.2 Testing and Inspection

5.2.1 Weld Inspection

1. All welds shall be performed per the requirements of Section 4.2.2.
2. Weld dimensions shall be verified within the tolerances of ISO 13920 [3.1.8.1]. Pass/Fail for each inspected weld shall be recorded on a weld map.
3. Weld inspections shall be performed in accordance with the following requirements to satisfy the QC-1 classification:
    a. All welds shall undergo visual examination of 100% of their length.
    b. All partial joint penetration (PJP) welds shall undergo magnetic particle examination or dye penetrant testing.
    c. All complete joint penetration (CJP) welds shall undergo volumetric inspection either by ultrasonic examination or radiographic examination (X-Ray or gamma radiation). Digital radiography is preferred over film radiography
        i. Ultrasonic examination per ASTM E164 [3.1.4.10] or ISO 17640 [3.1.8.3]
        ii. Film radiographic per ASTM E94 [3.1.4.11]
        iii. Digital radiography per ASTM E2445 [3.1.4.12], ASTM E2698 [3.1.4.13], or ISO 17636-2 [3.1.8.2]

4. All unacceptable welds shall be repaired using a repair procedure approved by US ITER. All unacceptable welds shall be documented by the suppliers NCR procedure. An examined item with one or more defects shall be repaired or replaced; the new work shall be re-examined by the same methods, to the extent possible, and by the same acceptance criteria as was required for the original work.
5. All NDE performed shall be documented, with the documents traceable for each weld on each support using the support naming schema as described in (Section 4.4).

5.2.2 Dimensional Inspection

1. All supports shall undergo a complete dimensional inspection. The inspection report shall be provided to US ITER in the form of measured dimensions, clearly marked on the US ITER provided drawings and an indication if the measured dimension is 'Pass' or 'Fail.' The report shall be traceable to the support structure via PNI or Support Number. For some dimensions, the drawing shows both a design length, and a fabrication length in brackets, which is longer. This additional length is provided to allow for field fit-up. To 'Pass', dimensions must be within the specified tolerance of drawings for the longer fabricated length, shown in brackets.
2. Unless a dimension specific tolerance is indicated on the US ITER design drawings, all machined components used in the construction of the support must be shown to be compliant within the tolerance Class M of ISO 2768 [3.1.8.6] with tolerance Class K of the same standard for straightness and flatness.
3. Dimensional inspections shall occur on all welded subassemblies to verify post welding dimensional compliance with the US ITER provided design drawings within the tolerance specified by Class B within ISO 13920 [3.1.8.1]. In addition to verifying dimensional requirements, flatness of welded components shall also be verified to ensure compliance with the requirement of Table 3, Tolerance Class F in the same standard.
4. All measurement and test equipment shall be traceable, calibrated, and have current calibration certification as required by the Seller's internal quality assurance program.
5. Part markings and method of applying markings shall be verified as part of the dimensional inspection.

5.2.3 Coating Testing and Inspection

1. The Dry Film Thickness (DFT) shall be measured in accordance with ISO 19840 [3.1.8.4] on each individual layer, using a micrometer properly calibrated on a prepared surface in accordance with ISO 8503-1 [3.1.8.11], or alternatively on a smooth surface, applying the appropriate correction to the reading.

2. Coating Certificate of Conformance/Analysis required.
3. A test coupon is to be coated for each coating batch throughout the process of coating the supports, and a coating adhesion test is to be performed on them in accordance with ASTM D4541 [3.1.4.9]. The acceptance criteria is that all of the five specimens shall exhibit a pull of at least 21 kg/cm^2 (300 psi, 2 MPa).
4. 100% of the RPS Supports shall be low voltage discontinuity (holiday) tested per NACE AMPP SP0188 [3.1.9]. Testing will be conducted in the immediate area where the pipe spool is in contact with the coated carbon steel Hollow Structural Sections (HSS). Failure can be rectified by recoating per Technical Specification requirements and retested.

6. PREPARATIONS FOR DELIVERY

6.1 Marking and Identification

Any special handling instructions shall be clearly marked on the outside of the packaging. If applicable, chemical and radiological hazards shall be marked on the outside of the packaging in accordance with regulations. All such markings shall be in English.

All support elements, including inseparable assemblies such as weldments, plates, lugs, etc., must be labeled with the part number specified in each drawing's Bill of Materials.

6.2 Methods of Packaging

Components shall be packaged with adequate protection from damage due to shifting, impact, mechanical stress, and thermal stresses. The packaging shall ensure that all components remain dry internally and externally.

Component sub-assemblies requiring additional field welds for completion shall be packed with both the sub assembly and the additional materials secured together and clearly identified as belonging to the same final assembly.

If adhesive tape is applied to the items, it shall be fully removable, leaving no residue or adhesive when removed using isopropyl alcohol.

Each support set must be securely boxed or packaged as a complete kit (using a cardboard box, wooden box, pallet, or crate) to prevent any loose items from becoming lost or separated from the set. Packaged kits may be consolidated onto pallets or contained within larger crates for transport and storage. Pallets and crates must be a minimum depth of 750 mm or shipped on a standard wooden pallet to ensure compatibility with warehouse storage racks. Additionally, crates must not exceed dimensions of 3.5 m × 1.2 m × 1.2 m in any dimension without prior TPO authorization.

6.3 Methods of Storage

Items shall be stored in a clean dry environment free of corrosive or reactive contaminants.

7. ACRONYMS

AISC	American Institute of Steel Construction
AMPP	Association for Materials Protection and Performance
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
AWS	American Welding Society
CJP	Complete Joint Penetration
CRL	Current Reference List
DFT	Dry Film Thickness for coating (paint)
EDRM	Enterprise Document and Records Management
EN	European Standard (Européenne Norme)
HSS	Hollow Structural Sections
IO	ITER Organization
ISO	International Standards Organization
MSS	Manufacturers Standardization Society
NACE	National Association of Corrosion Engineers
NCR	Non-Conformance Report
NDE	Non-Destructive Examination
ORNL	Oak Ridge National Laboratory
PJP	Partial Joint Penetration
PNI	Part Number Identifier
QC	Quality Classification
RPS	Roughing Pump System
SIC	Safety Important Component
SSPC	Society for Protective Coatings
USIPO	US ITER Project Office