TATA STEEL

TATA

Tata Steel Technical Standard

S1300401 Ordering, realisation and inspection of new construction, repair or modification of pressure equipment

Author: R. W. Zeegers

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Information and amendments

Contents of document:	PTC CTY KDT	+31 (0)251-498834
Standardization:	ptc-adm@tatasteel.com	+31 (0)251-494443

Contents

1 Objective of the standard

This standard covers the supply, repair, modification and overhaul of pressure equipment covered by:

- The “Warenwetbesluit drukapparatuur” and the “Warenwetregeling drukapparatuur”. (The Dutch Commodities decision pressure equipment 2016 and the Commodities regulation pressure equipment)
- The “Richtlijn drukapparatuur” (Pressure Equipment Directive PED 2014/68/EU, formerly 97/23/EC),
- The “Richtlijn drukvaten van eenvoudige vorm” (Simple Pressure Vessels Directive 2014/105/EU, formerly 2009/105/EC),
- Additional DTD registered pressure vessels. These are among other pressure vessels which were manufactured in the past in accordance with the “Regels voor Toestellen Onder Druk RTOD)” (Rules for Pressure Vessels); based on statutory regulations.

This standard specifies the procedure of deliveries, repairs, modifications and overhaul (of safety devices) that must be carried out by the manufacturer or contractor.

Within the scope of pressure vessels within Tata Steel the following also applies:

- Tata regulation Quality Health Safety and Environment (QHSE) 5.22: Equipment under pressure
- Tata technical directive R1300401, Guideline Pressure Equipment,
- Contract Format for CAPEX projects (General Conditions of Contract (GCC)).

2 Organisation

For all matters within the scope of these regulations information can be obtained from:

The Supervision Authority Pressure vessels / De Dienst Toezicht Drukhouders (DTD),Tel:+31(0)251494083,
postal address: Tata Steel IJmuiden, PTC CTY KDT DTD, 2H13, PO Box 10 000, 1970 CA IJmuiden.

The DTD, being the Inspection Department of the User (IVG), is the department that coordinates on behalf of Tata Steel IJmuiden with the Dutch Conformity Assessment Body NL-CBI (formerly AKI). The NL-CBI for Tata steel IJmuiden is Lloyd's Register - Stoomwezen. (Pressure vessel inspectorate).

With respect to this Standard DTD provides:

- The Issuing of a Tata Steel serial number (DR/K/L/V+number) and provides a Tata Steel identification plate.
- The Issuing of a Tata Steel VH number for identification of safety devices.
- The implementation of the inspection before Commissioning (Keuring voor ingebruikname KVI).
- The central management of the manufacturing reports, EU-Declarations of conformity, test reports of safety devices, the statement of inspection before Commissioning (Verklaring van ingebruikneming VVI).
- For repairs and modifications, the design assessment and the statement/check of inspection and test requirements in collaboration with NL-CBI.

3 New built pressure equipment

3.1 General

Pressure Equipment needs (if applicable) to be delivered in accordance with the European Directive PED 2014/68/EU or 2014/29/EU. The PED harmonized standards must preferably be used such as EN 13445, EN 13480, EN15001-1, etc. Use of other (non-harmonized) codes such as: RTOD, AD-merkblatter, ASME, etc after consultation with the DTD.

The Directive requires the manufacturer among others to:

- Provide a user manual in the Dutch language (Article 6 of the Dutch Commodities decision).
- Provide Marking and Labelling (PED annex 1 article 3.3)
- Undertake a risk assessment.
- Providing a EU declaration of conformity. (Depending on the selected module and category classification of the pressure vessel, involvement of an EU Conformity Assessment Body EU-CBI (formerly Notified Body) is more or less required.

Prior to order it should be clear:
- Which party is deemed to be the "manufacturer in the sense of the PED". In case of doubt the supplier must inquire by the client.
- Whether the pressure vessel is subject to the registration requirement (registration by DTD) Also see: R1300401 section 3.5.

If Tata Steel is the manufacturer, in line with the realization of new piping, the procedure as stipulated in Tata Steel directive R1300401 must be used. In that case, Tata delivers the "EU Declaration of Conformity" with the PED, if necessary supported by the underlying statements "Declaration of conformity for manufacture and installation equipment" and a "Declaration of conformity for pressure equipment design" (see R1300401).

Upon delivery of an assembly a declaration of conformity and other documents must be delivered per component that is subjected to the registration requirement (see chapter 3.2).

If the instruction manual states preconditions or exclusions relating to their use (e.g. the mandatory execution of NDT inspections during the operational phase), then client consultation must take place in the tender/ordering phase.

The designed operating temperature for an outdoor installation is based on S1475001; Minimum Design temperature is -10 °C for above ground and 0 °C for below ground installation. As a consequence of the fluid to be contained, a lower design temperature may be determined. The maximum design temperature is 50 °C above ground and 35 °C below ground. As a consequence of the fluid to be contained, a higher design temperature may be determined. For above-ground, low pressure, large diameter pipelines (<0.5 bar and > DN500), and their supports a minimum design temperature of -20 °C is selected.

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3.2 Required documents

In addition to the PED documents required, the manufacturer must also supply the documents listed below. For pressure vessels subject to registration, a copy must also be submitted to the DTD.

- Construction drawing and parts list
- A manufacturing report, if the pressure vessel according to the PED is classified in the highest hazard category of the appropriate table and/or KVI is required. Exceptions to these are:
  - accumulators manufactured in series which are filled with oil and nitrogen
  - air/nitrogen pressure vessels manufactured in series built according to 2014/29/EU
- A P&ID diagram, if multiple pressure vessels are part of an assembly.
- A classification list (model RTOD page G0402 Annex 1 or model PRD 2.1 Annex 4) where multiple pressure devices are part of an assembly.

For "Content Manufacturing Book Pressure vessels" see Annex 1.

It is recommended to use this document as a table of contents for the manufacturing book that is presented. Pre manufacture, the documents index is reviewed on the documents to be presented and who will supply them. After manufacturing the agreed documents are checked, after which the form is signed for approval.

It is preferable to submit the Manufacturing Book in a digital format as a PDF indexed in accordance with the table of contents conforming to Appendix 1. (For the submission of the PDF see Technical Directive R1050801 paragraph 3.7). Before and during work the documents are as much as possible checked and signed off, according to the "Inspection and Test Plan". Once all the documents have been agreed and signed, the manufacturer realizes the digitalization of the manufacturing book.

3.3 Registration (labels)

If the pressure vessel is subject to registration (see chapter 3.1), the manufacturer must mount the serial number plate with the Tata Steel identification number on the pressure vessel.

The supply of these serial number plates (K/V/DR-number) is serviced by the DTD. The plate dimensions to be mounted are 80 x 150 mm.

The numbering of bladder-type accumulators and stationary arranged N2 bottles are conducted by the DTD themselves.

Piping subjected to registration requirement does not get a number plate; registration takes place on the basis of the assigned L - number. The boundaries of the piping section subjected to registration must be defined on a drawing.

Safety devices must be provided with a unique serial number or a VH-number, to be mounted by the manufacturer or Safety devices overhaul firm. VH numbers are issued by the DTD.

3.4 Accessories

New accessories such as fittings, safety devices etc, are to be supplied in accordance with the European Directive PED 2014/68/EU and will be CE marked and have an EU declaration of conformity. Safety devices for pressure vessels covered by cat II (PED) or higher, the inspection document (in conformity with NEN-EN 10204) of pressure loaded components must be: type 3.1 (plus an specific EU-CBI quality system certification) or type 3.2.

New safety devices that protect pressure vessels against overpressure are subject to registration and must be provided with a unique identity (VH) number.

VH numbers are issued centrally by the DTD. The safety devices concerned must be accompanied by a test report (meetbrief) (see Annex 2 for an example).

Safety devices which are not reconditioned after operational use but replaced do not require a VH number. Even so these safety devices must be identifiable through an ID (factory) number and the test report must be available. The registration of the safety device will be stated on the DTD-annotation sheet (DTD-aantekenblad) of the pressure vessel to be secured. The test report must be provided to the DTD and the owner.

Existing safety devices that protect against a pressure overrun which are subject to registration (Registration by the DTD), must be periodically reconditioned. Boiler safety devices every two years, other safety equipment every 4 years. Extension from 4 to 6 years is possible, in consultation with the DTD/NL-CBI, if the fluid to be secured is not contaminating and checks insures proper functioning (no contamination and degradation e.g. through vibration)

For the procedure "Overhaul of safety devices, requirements to the reconditioning firm and an example test report": see Appendix 2.

4 Inspection of pressure equipment before commissioning (KVI)

After installation and before commissioning, the user performs an acceptance program. The inspection criteria as listed in Annex 4 of technical directive R1300401 can be used as a guideline.

When pressure equipment is subject to registration, the NL-CBI/DTD will perform an inspection before commissioning (Keuring Voor Ingebruikname KVI). In this case, the manufacturer shall inform the DTD in advance so that the KVI shall be carried out in collaboration with NL-CBI.

5 Modifications and repairs of pressure equipment

In the contract, the client should indicate whether the pressure vessel is subject to the registration requirement. If this is unclear, the contractor must then enquire by the client or the DTD.

The summary below indicates the repair or modification procedure for equipment, subjected to registration or non-registration:

Pressure Equipment subjected to registration (involvement DTD)

- The user, reports (prior to) repair/modification to DTD.
- User/manufacturer determines and specifies whether the modification fits within the existing Risk Inventory (RI). If necessary, the R.I. is adjusted.
- User/manufacturer submit a proposal for repair/modification to DTD/NL-CBI.
  Proposal must be in accordance with the essential safety requirements as listed in Annex I of the PED. Generally this means that the proposal is based on recognized standards such as the RTOD or NEN-EN 13445.
- NL-CBI/DTD assesses the repair/modification proposal.
- NL-CBI/DTD makes an inspection plan, preferably referring to the manufacturer's/contractors inspection plan.
- NL-CBI/DTD follows up the repair/modification based on the inspection plan.
- Manufacturer/contractor sends as-built data and repair/modification documents for verification to NL-CBI/DTD.
- NL-CBI/DTD registers the findings on the DTD-annotation sheet (aantekenblad) and informs the user.
- If repair /modification affects the manner of operation, the equipment arrangement or the location then an inspection before commissioning (KVI) follows by NL-CBI/DTD.

Pressure equipment not subjected to registration requirement

- The contractor carries out the repair / modification, in compliance with regards to recognized standards such as the RTOD or EN 13445 and registers this.
  Tata standard S1450401 (execution and inspection of welding in steel) applies. Welding on pressure loaded components requires weld category 2 as a minimum.
- If due to the proposed modifications (e.g. as a result of different process conditions, increased volume, changed installation arrangement) the equipment falls under the registration requirement, then the procedure, as mentioned above, must be followed. The equipment must also be registered with the DTD.
- In case the involvement of an NL-CBI is required, Lloyd's-Stoomwezen (NL-CBI) must be informed. Therefore, prior to the repair /modification work, the DTD must be contacted to inform Lloyds.

6 References

This standard refers to:

Warenwet besluit (Commodities decision pressure equipment)	Decree of July 15 2016, establishing the Dutch Commodities decision 2016 pressure equipment .
Warenwet regeling (Commodities regulation pressure equipment)	Regulation of the Minister of Social Affairs and Employment, July 11, 2016, 2016-0000163111, establishing the Commodities regulation 2016 for pressure equipment.
Directive 2014/68/EU PED (formerly 97/23EC)	Directive of the European Parliament and of the Council of May 15 2014 concerning the harmonization of member states laws concerning the marketing of pressure equipment.
Directive 2014/29/EU SPV (formerly 2009/105/EC)	Directive of the European Parliament and of the Council of February 26 2014 concerning the harmonization of member states laws concerning the marketing of simple pressure vessels.
RTOD	(Dutch code) Rules for Pressure Vessels
EN 13445	Unfired pressure vessels not exposed to open flame (harmonized standard)
EN 13480	Metallic industrial piping systems (harmonized standard)
NEN-EN 15001-1	Gas installation Piping with operating pressures greater than 0.5 bar for industrial and non-industrial gas installations - Part 1: Detailed functional requirements for design, materials, construction, inspection and testing.
EN 10204	Metallic products - Types of inspection documents
PRD	(Dutch) regulations pressure vessels during lifetime (Praktijk Regels voor Drukapparatuur)
Tata Steel standard: S1450401	Execution and inspection of welding in steel
Tata Steel standard: S1475001	General provisions for determining design code and design/operating conditions of new or piping systems to be modified or repaired
Tata Steel Directive: R1300401	Guideline pressure equipment
Tata Steel Regulation QHSE	5.22: Equipment under pressure

7 Statement

This Tata Standard replaces Corus standards:

30.00.01.010, 30.00.01.011, 30.00.04.001, 30.00.04.010, 30.00.04.015, 30.00.04.016, 30.00.04.017, 30.00.04.018, 30.00.40.001 en 30.00.40.005.

Version 1.1
Logo modified.

Version 2.0
Standard entirely revised.

Version 2.1
Minor changes in section 3.1; Chapter 5 section C and D. All regulations mentioned in Dutch.

Version 3.0
Chapter 5 is modified; Item A till D are changed in pressure equipment with registration obligation and pressure equipment without registration obligation. Several small changes.

Version 3.1
Chapter 5 modified.

Version 4.0
Chapters 1 and 2 supplemented. Section 3.1 supplemented and Section 3.3 overhaul procedure for safety devices inserted among other things.

Version 4.1
Chapter qualification DTD (IVG) mentioned. Section 3.3 identification safety devices changed.

Version 4.2
Reference to R1300401, dimensions identification plate and classification list inserted.

Version 4.3
Reference to QHSE, Specifying applied outside temperature, conversion of Corus to Tata Steel logo and name, and several minor changes implemented.

Version 5.0
Reference to revised laws and regulations implemented. Contents manufacturing book added as document. safety devices procedure relating to workflow; dismantling on site, cleaning, overhaul, transportation, installing and reporting, are listed in more detail.

Appendix 1 – Contents Manufacturing Book Pressure Vessels

Tata Steel IJmuiden
Projects & Technical Consultancy TATA STEEL TATA

KDT Quality Management System KDT-FORM-036 Manufacturing book pressure vessels

Project: ...	**Contractor:** ...
Tata Steel order no.: ...	Contractor order no.: ...

Pressure equipment: ☐ **Vessel**	☐ **Piping**	☐ **Boiler**	**DTD Serial Number:** ...					
Fluid + hazard group	**DN size / Volume**	**Design**		**Design code**	**Weld Cat.**	**PED**		**IBC**
		Press	**Temp.**			**Cat.**	**Mod.**	
...	...	...	...	...	...	...	...	☐ Y ☐ N
...	...	...	...	...	...	...	...	☐ Y ☐ N

Tab	**C**	**T**	**Items** (For Explanation see S1300401 Appendix 1 page 2)	**Doc**
01	☐	☐	Tata Steel order + Technical specification / specifications	☐
02	☐	☐	Calculations: internal pressure / pipe stress / external loads	☐
03	☐	☐	Drawings + Partslist	☐
04	☐	☐	Application form conformity assessment PED	☐
05	☐	☐	PED risk analysis	☐
06	☐	☐	Design Appraisal Document (DAD)	☐
07	☐	☐	As Built ISO's	☐
08	☐	☐	Inspection & Test Plan (ITP)	☐
09	☐	☐	Welding Procedure Specification (LMB's / WPS's)	☐
10	☐	☐	Procedure Qualification Record (LMK's / PQR's)	☐
11	☐	☐	Welder Performance Qualification (LK's / WPQ's / WQR's / WQTC's) + index	☐
12	☐	☐	NDO / NDT procedures + NDT personnel certification, Se75 Motivations thin wall testing	☐
13	☐	☐	Line Inspection Summary Lists (LISL's) / Weld map	☐
14	☐	☐	NDO / NDT report	☐
15	☐	☐	Motivations "gouden lassen" + Report "gouden lassen"	☐
16	☐	☐	Pickling- and passivation procedure + report	☐
17	☐	☐	Pressure test procedure (leak test, strength test) + pressure report + calibration report	☐
18	☐	☐	Flange joint report	☐
19	☐	☐	Conservation procedure + conservation report (incl. PE coating)	☐
20	☐	☐	Visit reports EU-CBI; Repair/modification NL-CBI (Lloyds)	☐
21	☐	☐	PED operation instruction	☐
22	☐	☐	EU-Declaration of Conformity (DoC)	☐
23	☐	☐	Users Declaration of Conformity	☐
24	☐	☐	EU-CBI Declaration of Conformity	☐
25	☐	☐	Application form inspection before commissioning KVI + Statement VVI	☐
26	☐	☐	Overview list + material certificates + declaration of re-marking	☐
27	☐	☐	Particular Material Appraisals (PMA's)	☐
28	☐	☐	Bending procedure + bending report / Rolling procedure + rolling report	☐
29	☐	☐	Annealing procedure (stress- relief annealing) + annealing reports / curves	☐
30	☐	☐	Appendages: List + TCD's /TCF's (incl. PED Module certificates + manual)	☐
31	☐	☐	General: Technical Queries (before implementation), NCR's (after implementation)	☐

Agreement	**Contractor (C)**	**Tata Steel Project (T)**	**Tata Steel DTD**
Scope Documents	Signature:	Signature:	Signature:
	Name: ...	Name: ...	Name: ...
	Date: ...	Date: ...	Date: ...
Control Documents	Signature:	Signature:	Signature:
	Name: ...	Name: ...	Name: ...
	Date: ...	Date: ...	Date: ...

Remarks on "Content Manufacturing Book Pressure vessels":

- Header text "medium + hazard group" meaning: the fluid group (1a, 1b, 2, 3a ....) According to the Dutch Commodities regulation 2016 pressure equipment.
- Header "lascat" meaning: the Tata Steel welding category (cat. 1, 2, 3) in accordance with welding standard S1450401

- Column "C", document delivery Contractor (manufacturer of pressure equipment in the sense of the PED)
- Column "T" document delivery Tata (user/client)
- Column "Doc" required document for manufacturing pressure vessels

- Tab 03 "Drawings + parts lists". Based on the drawing and parts list it should be possible to make a strength calculation.
- Tab 09 up to and including 16 and 26 up to and including 29 "Materials, Welding, NDT, bending and annealing documents", next to the applied design code see also the Tata Steel standard S1450401.
- Tab 17 "Pressure Procedure", see next to the applied design code also the Tata Steel standard S1475001.
- Tab 19 "Preservation Procedure" see Tata Steel standard S3105601.

If a P&ID is desired it must provide conclusions on:
- Where the pressure vessel in the system of piping and equipment is fitted.
- Where the pressure and flow (capacity) is generated.
- Where the pressure vessel is secured on over pressure.

The form "Content Manufacturing Book Pressure vessels" can be downloaded as a word document via

http://veiligheid.tatasteel.nl/nl/voorschriften/

Appendix 2 - Procedure overhaul safety devices, requirements reconditioning firm and an example test report

Requirements reconditioning firm

- Reconditioning should be carried out by a reconditioning firm which is NEN-EN-ISO 9001 certified and has an NL-CBI certified quality management system (see list Lloyds approved reconditioning firms).
- On overhaul a safety device Praktijk Regels Drukapparatuur (PRD) 3.2 chapter 13 applies.

Process and reporting in relation to the overhaul of safety devices

- Overhaul of a safety device must be reported in advance to the DTD by the relevant business unit.
- Prior to overhaul the following must be settled: Name client, Installation location on Site at Tata, Identification of the pressure vessel to be secured (DR, K, L, V number or else (e.g. pressure system, equipment)), possibly with reference to a P&ID for determination of location in the pressure system, Pressure setting.
- A safety device must be provided with a unique identification number "VH-no.". If the VH number is not present, the reconditioning firm must contact the DTD.
- VH Numbers are centrally issued by the DTD (for postal address see chapter 2).
- After removal from the installation safety devices and inlet/output piping must be inspected immediately by the owner and/or disassembling (reconditioning) firm for contamination/damage. If contamination/damage is detected then this must be reported to the DTD and reported on the test report.
- After cleaning at Tata Steel transport to the reconditioning firm takes place.
- If a pre-test is requested by Tata (client/DTD), it should be performed by the contractor (It means testing of the opening pressure after cleaning and before overhaul).
- Findings gained after a disassembly and inspection in the plant and by overhaul (operation, free movement, etc.) of the safety device must be stated on the test report by the reconditioning firm.
- On the tag-plate (to be mounted on the safety device by the firm) must minimally be stated: VH-number, setting pressure and adjustment date.
- On the test report the VH number, name of the Tata Steel client and the object to be secured must be listed. Other information to be recorded on the test report, see PRD 3.2 chapter 13 and the example test report .
- The test report must be send to the DTD and client within 14 days after overhaul.
- Safety devices must be sealed.
- The DTD will perform random checks on overhaul/purchases.
- Transport of safety devices must be done in the vertical position and the safety device shall be secured in such a way that transport forces will not have any effect on the device
- If shipping bolts are fitted/tightened, then this must be stated clearly visible by means of labelling "Remove Transport bolts/wedge before use".
- The Input and output side must be sealed during transport and storage.
- Safety devices from storage must undergo a pre-test prior to fitting in relation to the possible exceeding of the statutory inspection interval period. This to be determined in consultation with the DTD.
- After installing the safety device, this must be reported to DTD.

Example of a safety device test report (meetbrief)

<table>
<tr><td colspan="3">Safety device test report (meetbrief)</td></tr>
<tr><td colspan="2">Client: Tata Steel
Department / Contact person / Tel :
Identification no.: VH (DTD issue)</td><td>Installation location:
Order no.:
Tag. no.:</td></tr>
<tr><td colspan="2">Manufacturer:
Serial number:
Inlet flange: DN PN</td><td>Type:
Office type:
Outlet flange DN PN</td></tr>
<tr><td colspan="2">Spring loaded safety device

Diameter (mm):
Height (mm):
Pitch (mm):
Wire gauge (mm):
Spring number:</td><td>Weight pressure safety device

Length lever arms (mm):
Weight on lever (kg):
Number of discs:
Disc diameter (mm):
Discs height (mm):</td></tr>
<tr><td colspan="2">Data before overhaul

Test medium:
Manometer number:
Pressure setting (initially) (bar):
Opening pressure (measured) (bar):
Governor ring height (mm):
Blow down setting (tnd):</td><td>Data after overhaul

Test medium:
Manometer number:
Pressure setting (bar):
Counter pressure (bar):
Governor ring height (mm):
Blow down setting (tnd):

Leakage testing (bubbles/min):</td></tr>
<tr><td colspan="3">Parts replaced</td></tr>
<tr><td colspan="3">Particulars/observations made during disassembly:</td></tr>
<tr><td>Initial: Lloyd’s-Stoomwezen

Date:</td><td>Initial: DTD:(tel. 0251-494083)

Date:</td><td>Tested by:

Date:</td></tr>
</table>