Grupa LOTOS S.A.	**TECHNICAL SPECIFICATION**	Spec. N^{o}
	Filling and emptying equipment for transportation of hazardous materials subject to TDT approval	8700

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1 Subject of specification

This specification and other documents referenced herein establish the minimum requirements for the design, fabrication, inspection and tests for pressure vessels tanks subject to UDT/ZDT.

for filling and emptying equipment (NO) for transportation of hazardous materials subject to TDT.

2 Scope of validity

This specification applies to the preparation of tender documents, inquiries and contracts for newly planned investment or modernization projects of Grupa LOTOS S.A.

It shall also be a basis for preparing both detailed specifications and inquiries for individual or package unit supplies.

2.1 Deviations

Any deviation from this specification and the relevant specifications, standards and related documents including proposals, which the bidder claims to be economically and / or technically superior solutions must be submitted in writing for review and approval by Grupa LOTOS S.A. Non-approved exceptions are not acceptable by Grupa LOTOS S.A..

The supplier must report in writing any ambiguity in this or any other specifications of Grupa LOTOS S.A. or non-compliance with the referred documents / standards and obtain a written explanation from Grupa LOTOS SA.

2.2 Order of Precedence

In case of conflicts existing between this specification and other documents, the following order of precedence shall govern:

- The current Polish legislation
- Terms of purchase order / contract and other requirements agreed in writing Grupa LOTOS S.A.
- Data Sheets approved by Grupa LOTOS S.A.
- This specification
- Other Specifications
- Drawings and other documents
- Standards

3 General requirements

The loading and unloading equipment-NO shall meet requirements of European Machinery Directive 2006/42/EC and European Pressure Equipment Directive 97/23/EC.

This specification shall be considered together with LOTOS Group S.A. specification No. 2530, for which all requirements have to be fulfilled.

It is assumed that for loading and unloading equipment NO manufactured and assembled in Poland for LOTOS Group S.A., TDT should be appointed as Notified Body.

3.1 Definitions and designations

- NB – Notified Body
- UDT – Office of Technical Inspection
- TDT – Transportation Technical Supervision
- NO – Loading and Unloading Equipment

In understanding of these requirements, reloading equipment should be meant as technical equipment consisting of tubular members (rigid and flexible) along with fittings and accessories used, connected by means of tight elements, enabling filling or emptying of below given tanks, intended for transporting of dangerous materials.

- cisterns in railway /road traffic and in inland navigation
- cistern containers
- large containers for bulk transport

These technical requirements include listed equipment, starting from flanges of cut-off valves connecting them with transfer or process pipelines, up to elements (inclusively) connecting reloading equipment with transporting containers.

Considering type of dangerous material being reloaded, equipment for reloading of following materials can be distinguished:

- gases — class 2 acc. to ADR/RID
- liquid inflammable — class 3 acc. to ADR/RID
- solid inflammable — class 4.1 acc. to ADR/RID
- toxic — class 6.1 acc. to ADR/RID
- caustic — class 8 acc. to ADR/RID
- various — class 9 acc. to ADR/RID

Temperature of material being reloaded is assumed as temperature specified in ºC, measured on inlet flange of equipment – according to direction of dangerous material flow.

Working pressure of dangerous material being reloaded is assumed as pressure specified in MPa, given in technical documentation of reloading equipment.

3.2 Authorities of manufacturers

3.2.1 Manufacturers of NO included in scope of relevant European Union directives, should submit each product to procedure of conformity assessment performed by NB.

3.2.2 Importer of NO is obliged to agree technical requirements with organ of relevant TDT entity.

Such agreement follows on application of importer, which should contain:

for NO

- designation of manufacturer and supplier
- type and name
- type
- working parameters
- number of devices

for materials

- type, grade and dimensions of material or elements
- destination of material or elements
- quantity of material or elements

Authorizations for manufacturers of transport containers NO, are granted by TDT according to UDT procedure given in specification N° 8100.

The same applies to manufacturer performing repair / modernization works.

3.3 Design, accessories and materials

Reloading equipment is composed of tubular members and tight connecting elements, as well as accessories.

Tubular members can be made as:

- rigid,
- flexible
- rigid – flexible, made of below specified materials.

Connecting elements can be made as:

- rotary articulated joints, supported on bearings, with suitably shaped sealing,
- bolted flanges, which render rotation of tubular members impossible (bolted connections with specified tightening torque),
- quick joints
- other, admitted by TDT.

Connections must be accomplished by method ensuring durable and tight joint, which introduces no additional stresses.

Accessories of reloading equipment should meet requirements of WUDT-UC-WO-A/01:10.2003, in scope established by TDT.

Design of reloading equipment should ensure its tightness in every operating condition, and should also:

- give consideration to nature of transport containers handling
- give consideration to type of dangerous material being reloaded
- preclude leakages of dangerous material residues after completion of reloading activities.

Off-position of reloading equipment should be specified in technical documentation.

Reloading equipment and pipelines should be colour coded and labelled with safety marks according to PN-92/N 01255 requirements and specification of pipelines' marking.

Design of equipment should ensure ease and reliability of connection with transport container.

Equipment intended for reloading of gases, toxic, liquid inflammable and caustic materials, should be furnished with quick-acting end valve, and joint of emergency equipment disconnection from tank valve flange. Listed elements of emergency protection should be actuated automatically or remotely.

It is allowed, on the grounds of agreement with TDT organ, to use other safety devices, accomplishing the same function.

Task of quick-acting end valve is to prevent outflow of dangerous material from equipment, after disconnecting it from transport tank.

Joint of emergency disconnecting should enable disconnecting of equipment from transport tank valve (valve flange) in emergency. Such joint should be equipped with two quick-acting valves, which after actuation should cause closing of connecting conduits on both sides of joint of emergency disconnection, ensuring tightness of disconnected elements.

Joint of emergency disconnecting have to be protected against unintentional activation.

Detailed information regarding control and instrumentation elements is given in 2530 standard.

Equipment intended for reloading of gases, toxic, liquid inflammable and caustic materials must be equipped with system of equipment draining (residual draining system), built as system of tubular conduits of small diameter, serving for emptying of equipment from dangerous material after completion of reloading.

In cases required by regulations, removal of dangerous materials residues from equipment must give consideration to conditions of environment protection, Health and Safety at Work and fire safety.

Thermal insulation is required for reloading equipment of dangerous materials, which temperature exceeds 70ºC. On the grounds of TDT organ consent, other protective measures against effects of dangerous material temperature influence, are also allowed.

Equipment should be furnished with earthing and electric shock protection, according to regulations and standards in force.

Use of welded tubes with longitudinal or spiral seam for elements of reloading equipment, is not allowed.

Materials used for construction of reloading equipment should be resistant to influence of dangerous materials being reloaded, or effectively protected against their action.

Materials used for construction of reloading equipment should comply with technical conditions of technical inspection WUDT-UC-WO-M/01:10.2003 – „Materials".

Guaranteed impact resistance of materials used for construction of equipment should conform to relevant ADR/RID requirements.

Materials and subassemblies of reloading equipment should be manufactured by works possessing authorization of technical inspection organ.

Materials used for construction of reloading equipment and their subassemblies should possess material certificates.

UNO should have nameplate containing following data:

- name of manufacturer,
- serial number,
- year of production,
- type designation, if exists
- parameters of equipment (nominal diameter, flow rate, working pressure and range of allowable temperatures of reloaded medium),
- destination of equipment (type of reloaded medium),
- manufacturer quality control mark
- date of recent testing and stamp of TDT inspector.

Each flexible reloading conduit should be furnished with nameplate durably affixed on it, made of corrosion resistant material and containing at least following data:

- name or brand of manufacturer
- number of standard or designation of intended use (admitted types of reloaded media),
- serial number and date of production,
- date of recent testing,
- test pressure.

Above data may be imprinted on bodies of conduits terminals.

4 Documentation

4.1 Technical documentation

Technical documentation has to be elaborated during design stage of NO. Manufacturer or person acting in his name should submit it in at least two copies to TDT body in order to approve it.

Technical documentation should contain:

- list of regulations and standards used,

- assembly drawings of units and subassemblies, as well as working drawings of elements, which will allow for execution of design solutions compliance check against requirements of standards and regulations
- part list of materials foreseen for equipment construction,
- technical data of thermal insulation, if exist
- diagram of hydraulic and pneumatic system, if exists
- diagram of heating system, if exists
- electric diagram of drive and control, schematic and assembly, if exists
- electric diagram of power supply, if exists,
- operating instruction,
- design calculations of equipment serving filling and emptying of transport tanks, in range resulting from risk analysis,
- risk analysis,
- program of trial runs and testing of subassemblies and whole equipment,
- pattern of nameplate,

agreed design of foundation construction acc. to regulations of work laws , if applicable necessity his made – for insight Operating manual should contain as minimum:

- general description of equipment, its intended use and technical characteristics,
- description of design, operation and adjustment of driving machinery, their assemblies and outfit elements (mechanic, electric, hydraulic or pneumatic),
- description of design, operation and adjustment of protective devices used,
- description of activities of equipment operation (description of control and signalling devices handling, indications of measuring and control instruments), together with drawings of such devices and instruments layout, method and principles of control, as well as duties and activities of operator before, during, and after job completion),
- requirements regarding safe operating of equipment serving filling and emptying of transport tanks, depending on its intended use and operating conditions,
- information regarding required skills and authorization of persons dealing with operation and maintenance of equipment serving filling and emptying of transport tanks,
- principles of performing maintenance activities, giving types and intervals of overhauls completion, as well as actions executed by service man, included in scope of his/her duties,
- lubricating instruction, containing specification of lubrication points – places, types of lubricants used for lubrications, in particular oils and greases, as well as lubrication intervals,
- list of failures or irregularities, which can occur during operation of equipment for filling and emptying of transport tanks, giving causes of such possible failures and remedies for them,
- periods of planned technical overhauls, of preventive nature, defined on the grounds of effective working time, giving range of maintenance activities and list of elements subject to replacement after given period of equipment operation expires,

- properties of medium intended for reloading.
- definition work zone and alarm zone of equipments loading NO made with rigid elements
- special data design connected with lifetime equipment loading in especially in case :

- fatigue
- corrosion

4.2 Registration documentation

To the application for registering NO in TDT should be submitted registration documentation in two copies, which should contain following documents:

- description of NO, containing its type and destination, place of installation, year of construction, serial number, allowable working and design pressure, range of allowable working temperatures, maximum throughput, nominal diameter of tubular members, overall length and dimensions of equipment for characteristic operation states, type of drive, type of current and supply voltage, description of electric shock protection, type of limit switches, description of signalling and emergency devices, mass of main components and overall mass;
- documentation delivered by manufacturer along with NO elements and accessories, specified in regulations regarding CE marking or in technical specifications agreed with TDT, in range relevant for assessment of starting safety level of equipment and execution of activities specified in point 5;
- assembly drawing of NO printed in legible scale, giving main dimensions, and dimensioned emergency and working zones of equipment or set of equipment;
- drawing of working zone with marked position of equipment, arrangement of control cab devices, distributing valves connecting arterial pipelines, and other devices present in

  working zone of NO;
- diagram of hydraulic and pneumatic systems,
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- diagram of heating system, if exists,
- electric diagram of drive and control, if exists
- operating, maintenance and repair instruction, prepared on Polish language,
- certificate of proper manufacturing and testing, issued by NO manufacturer,
- certificate of proper erection of NO and after-erection testing completion by erecting contractor
- certificate of completed non-destructive testing (radiographic or ultrasonic) proper assembly welds (if exist)
- certificate for cables according to standards PN-EN 10204, if exist
- reports of electric measurements, if required
- certificates of type examination for equipment made in explosion-proof version, if exist

- schedule of materials used for NO construction, together with certificates as required by standards acc. to PN-EN 10204
- authentication of foundations completion, if exists.
- licence on exploit of building object

5 Acceptance tests

NO acceptance tests include at least:

- inspection of the construction, consisting in checking of NO conformity to submitted registration documentation, specified in p. 4.2.
- hydraulic tests of all NO pressure elements, at pressure equal to 1,5 x maximum working pressure, lasting not less than 30 minutes; hydraulic subassemblies should be hydraulic factory tested before protecting them against corrosion or installing of thermal insulation. Hydraulic pressure test of whole equipment should be completed after full assembly is done. Hydraulic test performed with use of water may be in exceptional cases, and on the grounds of relevant technical inspection organ consent, replaced by test performed with use of another liquid or gas.
- checking of protective devices (including interlocking, if any)
- checking of limit and end switching devices operation (if exists)
- checking of tension members condition, their fixing and suspension elements (if exist)
- checking of driving machinery operation (if exist)
- checking of working movements speed,
- checking of state and operation (if such test will be possible) of emergency disconnection joint
- operating test of quick-closing valve
- checking of electric measurements reports (resistance of insulation, effectiveness of electric shock, continuity of grounding protection and resistance of grounding, resistance of insulating flange), if required
- leak proof test at working pressure during reloading operations.

Prior to commencing of acceptance, periodic test, user should submit declaration of reloading equipment and its co-operating devices readiness to testing.

6 Relevant documents

Any “Technical Specification” issued by Grupa LOTOS S.A. listed in Contract Files.

7 Codes and Standards

Designing and manufacturing shall comply with the latest editions of listed standards and regulations:

- Rozporządzenie Rady Ministrów z dnia 7 grudnia 2012 r. w sprawie rodzajów urządzeń technicznych podlegających dozorowi technicznemu Dz.U 2012 nr 0 poz. 1468 (Journal of Laws 2012 No. 0 item 1468)
- Rozporządzenie Ministra Gospodarki z dnia 18 lipca 2001 r. w sprawie trybu sprawdzania kwalifikacji wymaganych przy obsłudze i konserwacji urządzeń technicznych Dz. U.nr 79 poz.849 zmienione rozporządzeniem z dnia 20 lutego 2003 r (Dz.U.nr 50 poz.426) (Journal of Laws 2001 No. 79 item 849) .
- Załącznik „B" do „Umowy Europejskiej ADR dotyczącej międzynarodowego przewozu drogowego towarów niebezpiecznych"
- Rozporządzenie Ministra Transportu z dnia 20 września 2006 r. w sprawie warunków technicznych dozoru technicznego jakim powinny odpowiadać urządzenia do napełniania i opróżniania zbiorników transportowych Dz. U. 2006 nr 181 poz.1335 (Journal of Laws 2006 No. 181 item 1335)
- Rozporządzenie Ministra Transportu (Dz. U. 208' poz. 1242) z dnia 23 września 2011 r. zmieniajace rozporzadzenie w sprawie warunków technicznych dozoru technicznego jakim powinny odpowiadać urządzenia do napełniania i opróżniania zbiorników transportowych Dz.U. 2011 nr 208 poz. 1242 (Journal of Laws 2011 No. 208 item 1242).
- Rozporządzenie Ministra Gospodarki z dnia 21 grudnia 2005 roku w sprawie zasadniczych wymagań dla urządzeń ciśnieniowych i zespołów urządzeń ciśnieniowych wdrażające postanowienia dyrektywy Parlamentu Europejskiego 97/23/WE z dnia 29 maja 1997 w sprawie w sprawie zbliżenia ustawodawstw Państw Członkowskich dotyczących urządzeń ciśnieniowych Dz.U. 2005 nr 263 poz. 2200 (Journal of Laws 2005 No. 263 item 2200)
- Rozporządzenie Ministra Gospodarki z dnia 22 grudnia 2005 r. w sprawie zasadniczych wymagań dla urządzeń i systemów ochronnych przeznaczonych do użytku w przestrzeniach zagrożonych wybuchem wdrażające postanowienia dyrektywy Parlamentu Europejskiego i Rady nr 94/9/WE z dnia 23 marca 1994 w sprawie zbliżenia ustawodawstw Państw Członkowskich dotyczących urządzeń i systemów ochronnych przeznaczonych do użytku w przestrzeniach zagrożonych wybuchem (ATEX) Dz. U. 2003 nr 263 poz. 2203 (Journal of Laws 2003 No. 263 item 2203)
- Rozporządzenie Ministra Gospodarki z dnia 21 października 2008 r. w sprawie zasadniczych wymagań dla maszyn, wdrażające postanowienia dyrektywy Parlamentu Europejskiego i Rady 2006/42/WE z dnia 17 maja 2006 w sprawie maszyn oraz uchylającej dyrektywę 98/37/WE Dz.U. 2008 nr 199 poz. 1228 (Journal of Laws 2008 No. 199 item 1228)
- Załącznik do Zarządzenia nr 51/04/TD Dyrektora Generalnego Przedsiębiorstwa Grupy LOTOS S.A. z dnia 28 grudnia 2004r.
- WUDT-UC-WO Warunki Urzędu Dozoru Technicznego. (Conditions of Office of Technical Inspection. Pressure equipment.)
- PN-EN ISO 7010 Safety colours and safety marks

- PN-EN 13463-1:- Non-electric equipment in explosion hazard spaces. Part 1. Basic assumptions and requirements.

8 Record of changes

No.	Date	Description	Introduced by
0		This specification entirely replaces the former LOTOS Group S.A. standard No. PR 07 870 with the same title.	W. Zaborowski
1	30-11-2013	Review, update, standardize and changes to the Standard within scope of order No. OK/990/2012	Editorial board coordinated by T.Wróbel
-	31-08-2015	Page layout corrections, no contents changes.	T. Wróbel