Contents

1 Subject of specification 2
2 Scope of validity 2
2.1 Deviations 2
3 Definitions and marking 2
4 Description 2
5 Relevant documents 3
6 Attachments: 3
7 Index of revisions 6

1 Subject of specification

This specification used in conjunction with Standard Technical Specifications of the LOTOS Group establishes the minimum requirements for the design and erection considering the division of labor in specific disciplines.

2 Scope of validity

This specification applies to the preparation of tender documents, inquiries and contracts concerning new investments and modernization projects planned by LOTOS Group.

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

2.1 Deviations

Any deviations from this specification and relevant specifications, standards and documents, including the bidder's proposals indicating a more economic design or solution, shall be submitted in writing for checking and approval by LOTOS Group.
No deviation or modification shall be permitted unless confirmed by LOTOS Group.

The bidder shall present in written form any ambiguity or conflict between this standard and other LOTOS Group standards or other documents/standards referred to, and shall receive LOTOS Group's written explanation.

3 Definitions and marking

GLSA – Lotos Group Ltd [Grupa Lotos S.A..]

Instr – the instruments discipline

ELE – the electrical discipline

Mech –the mechanical discipline

4 Description

When preparing the technical design and during the realization – erection of the petrochemical plant for LOTOS Group the division of design and erection work shall be observed in accordance with the examples included in the appendices to this specification.

Under no circumstances this specification can be used as a guideline for overall and detailed technical solutions to the problems presented in the appendices.

The guidelines for detailed solutions are given in GLSA Specifications referred to in specific drawings.

This specification shows discipline limits for the most typical design cases.

For atypical cases not covered by the appendices the division between disciplines shall be solved by analogy taking into consideration statements included in item 2.1..

5 Relevant documents

Any "Technical Specification" issued by GRUPA LOTOS S.A. listed in Contract Files.

6 Attachments:

Attachment No. 1 – Flow instruments:

Interdisciplinary battery limits – Instrumentation / Mechanical.
– Orifice with flanges– standard installation.
– Orifice with flanges – with seal diaphragm.
– Venturi tube.
- Meter-run.
– Flowmeter installed on nozzle –magnetic, thermal type.
– Flanged flowmeters.
– Ultrasonic flowmeter – installation on pipeline.
- Pitot tube.
- Variable area flowmeter.

Attachment No. 2 – Level instruments:

Interdisciplinary battery limits – Instrumentation / Mechanical.
- dP transmitter with seal diaphragms.
- dP transmitter – tubing connection.
– Level transmitter, level gauge, level switch with external chamber installed directly on vessel for flanged valves.
- Level transmitter, level gauge, level switch with external chamber installed directly on vessel for socket weld valves.
- Level transmitter, level gauge, installed on standpipe for flanged valves.
– Radar transmitter with antenna.
- Rod radar transmitter.
- Radar transmitter on cylindrical vessel.

Attachment No. 3 – Pressure instruments:

Interdisciplinary battery limits – Instrumentation / Mechanical.
– Process connection for pressure instruments – nozzle on pipe.
- Process connection for pressure instruments – nozzle on vessel.
- Transmitter, pressure gauge with seal diaphragm – nozzle on pipe or vessel.

Attachment No. 4 – Analyzer:

Interdisciplinary battery limits - Instrumentation / Mechanical.
- Standard sample assembly.
– Sample probe assembly.

Attachment No. 5 – Temperature instruments:

Interdisciplinary battery limits – Instrumentation / Mechanical.
– Screwed connections – particular cases.
– Flanged connection.

– Storage tank

Attachment No. 6 – Steam heating – steam and condensate connection:

Interdisciplinary battery limits – Instrumentation / Mechanical.
– By header.

Attachment No. 7 – Instrument air supply:

Interdisciplinary battery limits – Instrumentation / Mechanical.
– Instrument air connection to main header of pipe diameter less than 4''.
– Instrument air connection to main header of pipe diameter more than 4''.

Attachment No. 8 – Control valve:

Interdisciplinary battery limits – Instrumentation / Mechanical.
– Control valve or on-off valve (all types).
– Pressure control valve with external pilot (impuls before or after valve) - PCV
– Temperature control valve - TCV

Attachment No. 9:

Interdisciplinary battery limits – Instrumentation / Mechanical.
– Machines monitoring.
– Pumps sealing system.

Attachment No. 10 – Cable culverts:

Interdisciplinary battery limits – Instrumentation / Civil.
– Cable culverts in buildings located in a safe area or under a road.
– Cable culverts in wall or floor of building.

Attachment No. 11:

Interdisciplinary battery limits – Instrumentation / Civil.
– Control rooms.

Attachment No. 12:
Interdisciplinary battery limits – Instrumentation / Civil.
– Main cable routing on site.
– Cable channels.

Attachment No. 13 – Signal transfer between: Instrumentation and Electrical Department:

Interdisciplinary battery limits – Instrumentation / Electrical.
– Binary signals.
– Analog signals.
– Digital signals.

Attachment No. 14 – Motors status monitoring:

Interdisciplinary battery limits – Instrumentation / Electrical.
– Conventional MCC (Motor control center).
– Intelligent MCC (Motor control center).

Attachment No. 15 –Signal transfer between: Instrumentation and Electrical Department:

Interdisciplinary battery limits – Instrumentation / Electrical.
– Power supply UPS distribution.
– General power supply – not from UPS.

Attachment No. 16 –Signal transfer between: Instrumentation and Electrical Department:

Interdisciplinary battery limits – Instrumentation / Electrical
- Electrical heating of protection boxes.

Attachment No. 17 – Motor operating valves:

Interdisciplinary battery limits – Instrumentation / Electrical / Mechanical.
- On-off motor operating valve, with simple actuator (controlled from MCC).
- On-off motor operating valve, with automatic actuator.

Attachment No. 18 - Motor operating valves:

Interdisciplinary battery limits – Instrumentation / Electrical / Mechanical.
– Motor operating valve controlled by analog signal.

Attachment No. 19 - Signal transfer between: Instrumentation and Communication:

Interdisciplinary battery limits – Instrumentation / Communication.
– Fire alarm and detection system.

Attachment No. 20 – Grounding system:

Interdisciplinary battery limits – Instrumentation / Mechanical / Civil / Electrical.

Attachment No. 21 – Earthing installation:

Interdisciplinary battery limits – Electrical / Mechanical.

Attachment No. 22 – Earthing installation:

Interdisciplinary battery limits – Electrical.

Attachment No. 23 - Pipelines – structures:

Interdisciplinary battery limits – Civil / Mechanical.
- Pipelines and structures

Attachment No. 24 - Pipelines – plant equipment:

Interdisciplinary battery limits – Vessels / Mechanical / Civil.
– Tanks, columns, heaters, reactors.
– Pumps, turbines, compressors, blowers.

7 Index of revisions

Item	Date	Description	Introduced by
		This specification supersedes in whole the previous LOTOS Group standard No. PR 07 105	B. Kowalewski
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