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TECHNICAL SPECIFICATION

Doc No: DSF-SPC-INS-018

Rev. 1

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HIGH PRESSURE (HP) TRANSMISSION SYSTEMS

STATION CONTROL PANELS

JUNE 2021

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1 INTRODUCTION

2 SCOPE AND OBJECTIVES

This Specification covers the minimum requirements for the design, supply and installation for Station Control Panel (SCP) for the buildings of the metering / regulating stations and pipelines of the natural gas transmission system.

Station Control Panel (SCP) containing process control equipment and circuits, indicating, recording and alarm facilities, transducers and relay modules for various functions.

Both the design and the equipment supply pertaining to SCP shall cover all requirements of the project, as shown on the P&IDs.

3 REFERENCES

3.1 Reference Documents

3.2 Reference Codes and Standards

2014/34/EU	Equipment Explosive Atmospheres Directive
2014/35/EU	Low Voltage Directive
2014/30/EU	Electromagnetic Compatibility Directive
MINISTERIAL DECISION 50/12081/642/2006 F A – GG B / 1222/5.9.2006	Security Home Electrical Installations (E.I.E.). Introduction of a Differential Current Installation of Construction and Fundamental Grounding
ELOT EN 1594 E3	Gas Supply Systems. Pipelines for Maximum Operating Pressure over 16 bar. Functional Requirements
BS EN 62561-1:2017	Lightning protection system components (LPSC). Requirements for connection components
BS EN 62561-2:2012	Lightning Protection System Components (LPSC). Requirements for conductors and earth electrodes
BS EN 62561-3:2017	Lightning protection system components (LPSC). Requirements for isolating spark gaps (ISG)



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BS EN 62561-4:2017	Lightning protection system components (LPSC). Requirements for conductor fasteners
BS EN 62561-5:2017	Lightning protection system components (LPSC). Requirements for earth electrode inspection housings and earth electrode seals
BS EN IEC 62561-6:2018	Lightning protection system components (LPSC). Requirements for lightning strike counters (LSC)
BS EN IEC 62561-7:2018	Lightning protection system components (LPSC). Requirements for earthing enhancing compounds
ELOT EN IEC 60079-0 E5	Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements
ELOT EN 60079-7 E3	Electrical Apparatus for Explosive Gas Atmospheres - Part 7: Increased safety e
ELOT EN 60079-10-1 E2	Electrical Apparatus for Explosive Gas Atmospheres – Part 10: Classification of Hazardous Areas
ELOT EN 60099-4 E3	Surge Arresters - Metal Oxide Surge Arresters without Gaps for A.C. Systems
ELOT EN IEC 60099-5 E3	Surge Arresters - Selection & Application Recommendations
ELOT EN 62305-1 E2	Protection against Lightning, Part 1: General Principles
ELOT EN 62305-2 E2	Protection against Lightning, Part 2: Risk Management
ELOT EN 62305-3 E3	Protection against Lightning, Physical Damage to Structures and Life Hazard
ELOT EN 62305-4 E4	Protection against Lightning, Part 4: Electrical and Electronic Systems within Structures
ELOT EN ISO 9001 E4	Quality Management Systems
ELOT EN ISO/IEC 17025 E3	General Requirements for the Competence of Testing and Calibration Laboratories
ELOT HD 384	Requirements for Electrical Installations
ELOT HD 60364	Electrical Installations of Buildings
EN 61000	Electromagnetic compatibility (EMC)



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EN 61643-11	Low Voltage Surge Protective Devices – Part 11: SPDs Connected to Low Voltage Power Distribution Systems – Performance Requirements and Testing Methods
EN 61643-21	Low Voltage Surge Protective Devices – Part 22: SPDs Connected to Telecommunication and Signaling Networks – Performance Requirements and Testing Methods
IEC 60664	Insulation Coordination for Equipment within Low-Voltage Systems
IEC 61643-12	Low Voltage Surge Protective Devices – Part 12: SPDs Connected to Low Voltage Power Distribution Systems – Selection and Application Principles
IEC 61643-22	Low Voltage Surge Protective Devices – Part 22: SPDs Connected to Telecommunication and Signaling Networks – Selection and Application Principles
IEC 62548	Design Requirements for Photovoltaic (PV) Arrays
IEC 62561-1	Lightning Protection Components (LPC), Part 1: Requirements for Connection Components
IEC 62561-2	Lightning Protection Components (LPC), Part 2: Requirements for Conductors and Earth Electrodes
IEC 62561-3	Lightning Protection Components (LPC), Part 3: Requirements for Isolating Spark Gaps
IEC 62561-4	Lightning Protection Components (LPC), Part 4: Requirements for Conductor Fasteners
IEC 62561-5	Lightning Protection Components (LPC), Part 5: Requirements for Earth Electrode Inspection Housings and Earth Electrode Seals
IEC 62561-6	Lightning Protection Components (LPC), Part 6: Requirements for Lightning Strike Counters
IEC 62561-7	Lightning Protection Components (LPC), Part 7: Requirements for Earthing Enhancing Compounds
ELOT EN 60071-1	Insulation Coordination – Definitions, Principles & Rules
ELOT EN 60071-2	Insulation Coordination – Application Guide



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EN 60664-1 Insulation Coordination for equipment within Low Voltage Systems

IEC 61643-11 Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power distribution systems - Requirements and tests

Note: For the referred Specifications, Codes and Standards, the last valid version is applicable.

4 ACRONYMS

AC	Alternating Current
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ATEX	ATmosphères EXplosibles (Explosive Atmospheres)
ATS	Automatic Transfer System
BMS	Building Management System
BVS	Block Valve Station
BCC	Back-up Control Centre at Nea Messimvria
CCTV	Closed Circuit Television System
CPR	Construction Products Regulation
CP	Cathodic Protection
CPU	Central Processor Unit
CS	Compressor Station
DB	Distribution Board
DC	Direct current
DCS	Distributed Control System
DEG	Detailed Engineering
DIN	Deutsches Institut für Normung (German Institute of Standardization)
DVA	Digital Voice Announcer
DVD	Digital Video Disc
EDG	Emergency Diesel Generator
ELOT	Hellenic Organization for Standardization



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ELV	Extra Low Voltage (nominal voltage not exceeding 50 V AC or 120 V DC (ripple-free) between conductors or to earth, as defined by the Standard EN 61558)
EN	European Norms
EPC	Engineering, Procurement and Construction
EU	European Union
ESD	Emergency Shut Down
F&G	Fire and Gas
FACP	Fire Alarm Central Control Panel
FARP	Fire Alarm Repeater Control Panel
FAT	Factory Acceptance Test
FEG	Field Engineering
FC	Floe Computer
FOC	Fibre Optic Cable
GCC	Gas Control Centre at Patima
HEDNO	Hellenic Electricity Distribution Network Operator
HDPE	High Density Polyethylene
HMI	Human Machine Interface
HVAC	Heating Ventilation Air Conditioning
I/O	Input / Output
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
ITU	International Telecommunication Union
LAN	Local Area Network
LCS	Local Control System
LED	Light Emitting Diode
LFEP	Local Fire Detection & Fire Extinguishing Panel
LV	Low Voltage
LSP	Load Share Panel
MSC/MCS/SMC	Main Station Controller
MV	Medium Voltage
MPS	Master Project Schedule



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MPR	Monthly Progress Report
NFPA	National Fire Protection Association
NNGTS	National Natural Gas Transmission System
NTSC	National Television System Committee
O&M	Operation and Maintenance
PID	Piping and Instrumentation Diagram
PA/GA	Public Address / General Alarm
PCS	Process Control System
PED	Pressure Equipment Directive
PEP	Project Execution Plan
PFD	Process Flow Diagram
PLC	Programmable Logic Controller
PMS	Power Management System
POC	Project Organization Chart
PAL	Phase Alternate Line
PPC	Public Power Corporation
PTZ	Pan, Tilt, Zoom
PVC	Poly Vinyl Chloride
QA	Quality Assurance
RCC	Remote Communications and Controls
RFI	Radio Frequency Interference
RTD	Resistance Temperature Detectors
RTU	Remote terminal Unit
S/S	Scraper Station
SAT	Site Acceptance Test
SCADA	Supervisory Control and Data Acquisition (including Telemetry)
SCS	Station Control System
SFP	Small Form-factor Pluggable
SPD	Surge Protection Device
SPL	Sound Pressure Level
UDP	User Datagram Protocol
UPS	Uninterruptible Power Supply



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UV	Ultraviolet
VGA	Video Graphics Array
VMS	Video Management Software

5 GENERAL

5.1 Process Data

Refer to the applicable Project documents for the relevant process data of process control equipment.

5.2 Units

Metric unless specifically stated otherwise.

6 CONSTRUCTION REQUIREMENTS

6.1 General

The SCP shall be cabinet type panel, free standing, with panel base for floor mounting and swing frames for front access, designed for 50cm standard racks. Transparent, lockable front doors are required.

The SCP shall have a high-quality corrosion resistant surface, with a coloured finish to RAL 7032.

The SCP shall be designed and constructed for easy repair and replacement of components, including easy access to cables and panel wiring.

None of the components included in the SCP may generate any interference signals which may cause electronic equipment failure and fault condition. The materials shall conform to the European Directive 2014/30/EC relevant to electromagnetic compatibility.

The SCP shall have a logical and clear build-up with suitable location of components.

The SCP shall be adequately ventilated.

Forced ventilation (with redundant fans) is preferred, but natural ventilation may be used in case of low thermal load.

Components mounted in the front of the SCP shall be at least 150 mm above the panel base.



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All components in the front of and inside the SCP shall be clearly marked with a permanent, durable label, giving an unambiguous identification of the component and function.

The SCP shall be provided with a pocket inside containing equipment layout and complete wiring diagrams.

The SCP shall have a 25% spare space capacity for future expansion.

Indicators, recorders, and operating equipment including switches and push buttons shall be mounted at the most convenient and accessible height, for easy operation and reading.

6.1.1 Enclosure Protection

Shall be to a minimum of IP 52 (ELOT EN 60529).

6.1.2 Ventilation

Natural ventilation louvers or redundant fans, as necessary.

6.1.3 Wiring

Wiring installation shall be neat and workmanlike, and in a manner preventing unacceptable electrical interference and stray pickup influences.

Cable duct filling factor shall be less than 50%.

Wiring shall run in ducts with removable covers.

The ducts shall be installed in a way providing easy access after installation.

A.C. power wiring shall be separate from D.C. and signal wiring, and shall not run in the same ducts.

Wiring for intrinsically safe circuits shall run in separate blue coloured ducts.

All wire ends shall be fitted with sleeve type identification markers.

In case of works on existing installation, former wiring system shall be taken into consideration in cooperation with the Owner.

6.1.4 Terminal Boards

The SCP shall be provided with terminal strips for termination of all incoming and outgoing cable cores and all cable cores/wires between different panel sections.

The terminal strips shall be located in a convenient and accessible location allowing easy connection and disconnection of cable cores.



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The terminals shall be line-up terminals of the snap-on type for rail mounting with facilities for latching between terminals.

The terminals shall be of the screw clamp type and have separation facilities for loop test purposes.

Terminals in intrinsically safe circuits shall be blue and separated through a physical barrier from other terminals.

Earth terminals shall be yellow with green stripes.

The terminals shall be clearly identified with permanently marked terminal numbers.

There shall be minimum one terminal for each cable core, screen, and braid, and a sufficient number of earth terminals.

The SCP shall be provided with minimum 15% spare terminals.

6.1.5 Alarm Systems

Alarm systems shall be of the dedicated type with visual indication for each alarm point and common audible alarm. The visual alarms shall be indicated on a common alarm annunciator operated by solid state electronic devices.

Each alarm (point) shall be identified by illuminating a translucent, backlighted nameplate describing the alarm in question.

The alarm light shall be activated upon actuation of the corresponding alarm point.

The alarm sequence shall be according to ISA S18.1 (ISA Sequence type F1A) or EN ISO 11064-5.

Acknowledge push-button shall have a timing function that will perform automatic acknowledge of the horn only, if manual acknowledge has not been performed within 5 minutes to 1 hour (adjustable).

The alarm unit shall have the (optional) facility of accepting remote Ack, Test and Reset signals (SPOT, free voltage contacts, rating of 2A at 24 VDC) from the SCADA system

It shall be possible to test the alarm lights by means of a common lamp test pushbutton.

Operation of the alarm system shall be via the 24-volt D.C. supply.

6.1.6 Interface Units for Intrinsically Safe Circuit

The SCP shall contain interface units for all intrinsically safe circuits. The interface units shall be of a type that provides physical separation (e.g. opto-isolation) between the safe area terminals and the hazardous area terminals.



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The interface units shall be approved by an Accredited Inspection Body for use with the field equipment specified.

Intrinsically safe circuits shall be connected to the common equipotential earthing system.

6.1.7 Internal Power Supply Distribution

The SCP shall be supplied, with 230V AC, 50HZ from UPS.

24 VDC will be made available and distributed by the appropriate power supply modules inside SCP.

Inverter units, where used, must not generate any interference signals which may cause electronic equipment failure or fault conditions.

Each instrument loop shall have its own power disconnect device (terminal strip types disconnectable terminal preferred), and its own overload protection device (terminal strip type fuse terminal preferred), both easily accessible and clearly labelled for easy identification.

6.1.8 Overvoltage Protection Equipment

The SCP shall be equipped with overvoltage protectors to protect against lightning overvoltage phenomena in the incoming signal lines.

All overvoltage which could cause damage to the SCP or associated equipment shall be diverted to earth.

Proper grounding and lightning protection systems shall be provided according to technical specifications.

6.1.9 Relay Systems

All incoming alarms shall be transmitted via relay modules to the alarm panel, the data logging and the telemetry systems.

The transmission of alarms shall have an adjustable delay built-in in order to prevent transmission of spurious alarms.

6.1.10 Front Panel Instruments

See individual Material Requisition.

6.2 Testing and Approval

6.2.1 Factory Acceptance Test

The Station Control Panel shall undergo a witnessed factory acceptance test which as a minimum shall include:



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- Check of switchboard construction.
- Check of performance of components and control systems.
- Check of location and marking of components.
- Check of wiring system and documentation consistency.
- Check of quality of component materials and surface treatment.
- Function check of components.
- Function check of control system to the extent possible.
- Test of electrical insulation with a test voltage of min. 2.5 kV.

FATs could be witnessed by the Owner (e.g. TPI).

6.2.2 Site Acceptance Test

The Station Control Panel shall undergo a functional test on site.

This test shall be carried out by the Supplier to the extent deemed necessary to demonstrate the full and proper functioning of the SCP.

The Supplier shall provide all necessary instruments, equipment, transport and personnel.

SATs could be witnessed by the Owner (e.g. TPI, Owner's engineer).

7 CERTIFICATION

7.1 Electrical Components and Equipment

All electrical equipment and components shall have Manufacturer's Test Certificates according to EU Directives requirements.

All electrical equipment and components used in "intrinsically safe" circuits shall have EEx-i electrical approval according to the requirements of EU Directive ATEX.

7.2 Station Control Panel

Manufacturer's statement of compliance with specifications and drawings etc. inclusive of approvals from authorities etc.

7.3 Station Control Panel Certification Package

Manufacturer's Test Certificates for all components and equipment used in "Intrinsically Safe" circuits.

EEx electrical approval and conformity certificates for all equipment and components used in "Intrinsically Safe" circuits.

Manufacturer's statement of compliance together with approvals from Notified Body.



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8 INSPECTION AND CERTIFICATION

Inspection will be performed by an Accredited Inspection Body appointed by Owner.

Inspection requirements are defined in the following documents.

- a. Material Requisitions.
- b. Job Specifications.
- c. Relevant project specifications.
- d. Inspection clauses of applicable Standards.

9 COMPLIANCE WITH THE EU DIRECTIVES

Instrumentation that complies with the "New Approach" directives shall be provided with:

- a. A physical CE marking and other information as required by the relevant directives.
- b. A declaration of conformity which lists all the directives with which the product complies.
- c. Any other information specified by the directive, e.g. user instructions.