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GAS INTERCONNECTOR GREECE-BULGARIA

PART:

REPORT WITH IDENTIFICATION OF DISCREPANCIES ON EXISTING DOCUMENTATION FOR SCADA SYSTEM

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00a	07.06.2017	Draft version
00b	07.07.2017	Comments Incorporated
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IGB-04-FEED-VI.15-01	Structural diagram IAPCS Gas Pipeline on the Territory of Bulgaria	0
IGB-04-FEED-II.3.6-03-06_08-19	Block Diagrams Telecom, BVs, System Block Diagram	0
IGB-04-FEED-III.6-03-06_09	Black diagrams systems - GMS2 Stara Zagora	0
IGB-04-FEED-III.6-ALL	Black diagrams telecommunications system - GMS2 Stara Zagora	0
IGB-04-FEED-IV.6-03-07_09-23	Black diagrams telecommunications system - Dimitrovgrad AGRS	0
IGB-04-FEED-V.6-03-07_09-23	Black diagrams telecommunications system - Kardzhali AGRS	0
IGB-04-FEED-VII.1-Comm1	Overall Architecture of Telecommunication Systems	0
IGB-04-FEED-VII.2-Comm	The logical topology of our network	0
IGB-04-FEED-VII.2_EXPL_NOTE	A LOCAL AREA NETWORK (LAN). NETWORK INFRASTRUCTURE. EQUIPMENT	0
IGB-04-FEED-VII.2.1_EXPL_NOTE	PART 2.1: VALVE BLOCKS	0
IGB-04-FEED-VII.2.2_EXPL_NOTE	Part 2.2: AGRS AND GMS	0
IGB-04-FEED-VII.2.3_EXPL_NOTE	Part 2.3: DISPATCH CENTER	0
IGB-04-FEED-VII.2.4_EXPL_NOTE	Part 2.4: SERVER ROOM	0
IGB-04-FEED-VII.2.5_EXPL_NOTE	Part 2.5: TELEPHONE SYSTEM	0
IGB-04-FEED-VII.3-Comm1	Scheme of organization of the system for monitoring of optical fibers	0
IGB-04-FEED-VII.3_EXPL_NOTE	Part 3: ACTIVE SYSTEM FOR MONITORING OPTICAL FIBERS	0
IGB-04-FEED-VII.4_EXPL_NOTE	Part 4: OPTICAL INFRASTRUCTURE. EXTERNAL CONNECTIONS WITH OTHER TELECOMMUNICATION OPERATORS.	0
IGB-04-III.6-BG	SUBPROJECT: GMS STARA ZAGORA	2
IGB-04-IV.6-BG	SUBPROJECT: AGRS DIMITROVGRAD	1
IGB-04-V.6-BG	SUBPROJECT: AGRS KARDJALI	1
IGB-04-VI.15-BG	SUBPROJECT: DISPACHING CENTER- Part ATP	0
IGB-04-FEED-VII.1_EXPL_NOTE	TECHNOLOGICAL CONNECTION – ORGANIZATION OF THE CONNECTIONS. EQUIPMENT OF THE CONNECTION SYSTEMS	0
10760-IN-00-01-001	OVERALL ICS SYSTEM SCHEMATIC	5
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10760-IN-B0-01-001	TYPICAL BLOCK VALVE/SCRAPER STATION - CONTROL SYSTEM SCHEMATIC	2
10760-IN-M0-01-001	TYPICAL METERING STATION - CONTROL SYSTEM SCHEMATIC	3
10760-IN-M0-01-002	TYPICAL AGRS STATION - CONTROL SYSTEM SCHEMATIC	3
10760-IN-M0-02-001	TYPICAL METERING STATION ICS SYSTEM BLOCK DIAGRAM	2
10760-IN-M0-02-002	TYPICAL AGRS STATION ICS SYSTEM BLOCK DIAGRAM	2
10760-IN-M0-02-003	TYPICAL METERING STATION TELECOMMUNICATION SYSTEM BLOCK DIAGRAM	2
10760-IN-M0-02-004	TYPICAL AGRS STATION TELECOMMUNICATION SYSTEM BLOCK DIAGRAM	2
10760-IN-ST-01-001	OVERALL SCADA CONTROL SYSTEM SCHEMATIC	2
10760-IN-ST-01-002	OVERALL TELECOMMUNICATION SYSTEM SCHEMATIC	2

Document Number	***Description***	***Rev***
10760-IN-ST-02-001	OVERALL TELECOMMUNICATION SYSTEM BLOCK DIAGRAM	2
10760-PHL-PR-00-002	Overall Process Description	2
10760-PRC-PM-00-011	Tag Numbering System Procedure	0
10760-RPT-IN-ST-001	SCADA System Integration Report	2
10760-RPT-IN-ST-002	Telecommunications System Report	3
10760-SPC-IN-00-008	Specification for ICS System Requirements	1
10760-SPC-IN-ST-005	Specification for SCADA Systems	2
10760-SPC-IN-ST-007	Specification for Telecommunications System	4
10760-SPC-IN-ST-009	Specification for Telecommunications System Interface	2
10760-LST-IN-A0-001	I/O List Typical Pigging Station	3
10760-LST-IN-B0-001	I/O List Typical Block Valve Station	3
10760-LST-IN-M0-001	I/O List Typical Gas Metering Station	3
10760-LST-IN-M0-002	I/O List Typical Automated Gas Regulating Station	3

2. Terminology and Abbreviations

The following table identifies the list of terminologies and abbreviations that have been used throughout this document.

Table 2 - Terminology and abbreviations

Abbreviation	***Description***
AGRS	Automated Gas Regulating Station
BV	Block Valve
DC	Dispatch center
ESD	Emergency shutdown
FOC	Fiber Optic Cable
GMS	Gas Measuring Station
IAPCS	Integrated Automated Process Control System
ICS	Integrated Control and Safety
IP	Internet Protocol
LAN	Local Area Network
MDC	Main Dispatch center
PLC	Programmable Logical Controller
PSD	Process shutdown functions
SCADA	System Control and Data Acquisition
VLAN	Virtual LAN
VoIP	Voice over IP

3. Introduction

The purpose of this document is to provide an analysis of consistency and identification of discrepancies of the Technical design and FEED documentation elaborated for Bulgarian and Greek territory for the Natural Gas Interconnector Greece - Bulgaria. The analysis is thoroughly related to design documents associated to the Integrated Automated Process Control System and its integral components.

Wherever English and Bulgarian design documents have been provided, the analysis is based on English documents only. Bulgarian documents are used for references only.

4. Documentation Overview

The report is developed on the extract from the full list of the project documentation for Bulgarian and Greek territory. The same is listed in Appendix A – List of Technical Design Documentation for the Bulgarian Section and Appendix B – List of FEED Documentation for the Greek Section respectively. A different color code is used to highlight the documents related for Process Automation and Telecommunication parts.

A careful study has selected the basis list of documentation used for development on the present report, the same list is provided in Table 1 - List of Reference Documents. Selected documents are extracted from the final deliverables lists relevant for Bulgarian and Greek sections. Extracted documents are thoroughly related to descriptions and specifications for Integrated Automated Process Control System as well as for Telecommunication System. The documentation related to the Telecommunication System is reviewed in aspect of the part related to the specific requirements for the Integrated Automated Process Control System. Documents that have not been taken into account are thoroughly belong to the following categories:

- Site Installation / Civil and Structural Design / Construction;
- Site Plans;
- Connection Diagrams / Loop Diagrams;
- Piping and instrumentation diagrams (P&ID) / Process Flow Diagrams;
- Bill of Quantities.

4.1 Documentation structure

4.1.1 Bulgarian Section

The documentation related to the Bulgarian section is organized based on the local legislation rules and regulations. The structure is organized hierarchy, based on Volumes, Sub-volumes and Parts. The index can be seen from the table below:

Table 3 - Bulgarian Section Document Index

Volume	*Sub-volume*	*Part*	*Section*	*Description*
I				GENERAL DOCUMENTATION
II				SUBPROJECT: TRANSMISSION GAS PIPELINE - IGB
III				SUBPROJECT: GMS STARA ZAGORA
IV				SUBPROJECT: AGRS DIMITROVGRAD
V				SUBPROJECT: AGRS KARDJALI
VI				SUBPROJECT: DISPACHING CENTER
VII				TECHNOLOGICAL CONNECTION – ORGANIZATION OF THE CONNECTIONS. EQUIPMENT OF THE CONNECTION SYSTEMS
VIII				EXTERNAL CONNECTIONS
IX				BILL OF QUANTITY DOCUMENTATION
X				RISK ANALYSIS
XI				PROJECT FOR ORGANIZATION OF THE CONSTRUCTION
XII				PLAN FOR MANAGEMENT OF CONSTRUCTION WASTE

The Parts are organized in accordance with the REGULATION № 4 dated 21.05.2001 for the scope and contents of investment designs. Different parts are identical at least for Volumes III, IV, V and VI and are listed in the table below:

Table 4 - Bulgarian Section Parts description

Volume	*Sub-volume*	*Part*	*Section*	*Description*
		1		GEOLOGY SURVEY
		2		MASTERPLAN AND VERTICAL PLANNING
		3		TECHNOLOGICAL PART AND TECHNOLOGICAL PIPELINES
		4		ARCHITECTURAL
		5		STRUCTURAL
		6		PROCESS AUTOMATION
		7		FIRE SAFETY

Volume	Sub-volume	Part	Section	Description
		8		ELECTRICAL
		9		TECHNOLOGICAL CONNECTION SYSTEMS
		10		HVAC
		11		ENERGY EFFICIENCY
		12		SAFETY AND HEALTH PLAN
		13		WATER SUPPLY AND SEWERAGE

4.1.2 Greek Section

The documentation related to the Greek section is organized according to the table below:

Table 5 - Greek Section Document Index

Index	Description
1	**OVERALL - GENERAL**
1.1	GENERAL
1.2	SAFETY REPORTS
1.3	PROCESS DESIGN
1.4	CIVIL AND STRUCTURAL DESIGN
1.5	ARCHITECTURAL DESIGN
1.6	BULDING MECHANICAL DESIGN
1.7	MECHANICAL / PIPING DESIGN
1.8	CATHODIC PROTECTION SYSTEM DESIGN
1.9	ELECTRICAL DESIGN
1.10	CONTROL AND INSTRUMENTATION DESIGN
2	**PIPELINE**
2.1	ROUTING
2.2	TOPOGRAPHICAL / CADASTRAL
2.3	SEISMIC DESIGN
2.4	GEOLOGICAL DESIGN
2.5	GEOTECHNICAL DESIGN
2.6	PIPELINE DESIGN
3	**BLOCK VALVE STATION BV1 - NIMFEA**

Index	*Description*
3.1	TOPOGRAPHICAL / CADASTRAL
3.2	CIVIL AND STRUCTURAL DESIGN
3.3	ARCHITECTURAL DESIGN
3.4	BULDING MECHANICAL DESIGN
3.5	MECHANICAL / PIPING
3.6	ELECTRICAL DESIGN
4	**KOMOTINI GAS METERING STATION – GMS1**
4.1	TOPOGRAPHICAL / CADASTRAL
4.2	CIVIL AND STRUCTURAL DESIGN
4.3	ARCHITECTURAL DESIGN
4.4	BULDING MECHANICAL DESIGN
4.5	MECHANICAL / PIPING
4.6	ELECTRICAL DESIGN

4.2 Conclusions

The documentation structure between Bulgarian and Greek section is quite different, therefore on-by-one comparison is difficult and in some cases even impossible. Regardless of the scope of responsibilities based on the geographical division, some documents are intended to cover objects and subjects out of the scope from the relevant - Bulgarian or Greek – sections. This leads to some misalignments – in case of changes and/or modifications within one of the section, the same is not aligned within the relevant documents in another section.

In general the documentation for the Bulgarian section is more detailed and the volume is significant bigger. The documentation for the Greek section is more descriptive and based mostly on typical schematics, drawings, etc. Therefore, the Greek section stands as FEED (Front End Engineering Design) and Bulgarian section – as Technical design.

The future EPC Contractor shall develop during detailed engineering phase of the IGB Project based on available documentation for the both countries and based on the latest technology a common SCADA and Telecommunication systems. The detailed design shall take into account the discrepancies of the available documentation and the provisions of the law in Bulgaria concerning the changes in Technical Design.

The future unified design shall incorporate also a common "List of Signals" (number/volume of signals, compatibility of protocols, speed of signals etc.) as a part of the common SCADA and Telecommunication systems for the whole IGB pipe line system.

5. System Overview

An overview of the Interconnector Greece-Bulgaria is shown on Figure 5-1 below. The diagram is taken from the Technical design in Bulgarian section. The dashed redline shows the physical Greece-Bulgaria border.

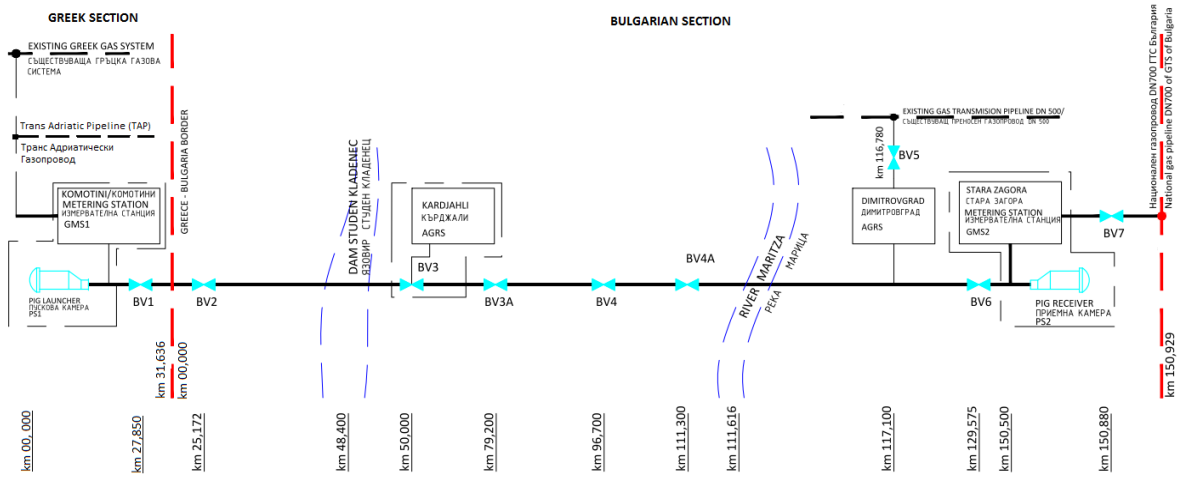

Figure 5-1 Interconnector Greece-Bulgaria Overview

All Overall ISC schematic diagrams and documents, developed for Bulgarian and Greek territory, cover the whole process units across the gas Interconnection Greece-Bulgaria. There are some misalignments between major Overall ISC documents. The table below summarizes the same:

Table 6 - System Overview Analysis

No	*Process Unit*	*IGB-04-FEED-VII.1*	*IGB-04-FEED-VI.15-01*	*10760-IN-00-01-001 10760-IN-00-02-001*	*Comments*
1	GIS-1 Komotini	√	√	√	
2	BV-1 Nimfea	√	**See comments**	√	Named as BV1 Komotini on IGB-04-FEED-VI.15-01 document
3	BV-2 Velikdenche	√	√	√	
4	BV2A	**Removed (Note 1)**	**Removed (Note 1)**	√	
5	BV-3 and AGRS Kardzali	√	√	**See comments**	Document 10760-IN-00-01-001 shows AGRS Kardzali only
6	BV-3A Mandra	√	√	√	
7	BV-4 Haksovo	√	√	√	
8	DC Haskovo	√	√	√	
9	BV-4A Dmitrovgrad	√	√	√	
10	BV4B	**Removed (Note 1)**	**Removed (Note 1)**	√	
11	AGRS Dimitrovgrad	√	√	√	
12	BV-5 Radievo	√	√	**Not exists**	
13	BV-6 Trakia	√	√	√	
14	GIS-2 Stara Zagora	√	√	√	
15	BV-7 Zagore	√	√	√	

Note 1:

As major differences between FEED and the Technical design must be mentioned these, stemming from changes in the regulations (as an illustrative example may be given Art. 40(1) of the Ordinance for the setting and safe exploitation of the transmitting and distributing gas-lines - the withdrawal of the requirement for constructing a bypass gas-line at the crossing of Studen Kladenets dam and Maritza river, including a block valves and stations for cleansing facilities at the banks of the water bodies). The Technical Design for Bulgarian section is developed at later stage than FEED for the Greek section and BV2A and BV4B are removed from the pipe line system

Document References

IGB-04-FEED-VII.1	Overall Architecture of Telecommunication Systems
IGB-04-FEED-VI.15-01	Structural diagram IAPCS Gas Pipeline on the Territory of Bulgaria
10760-IN-00-01-001	OVERALL ICS SYSTEM SCHEMATIC
10760-IN-00-02-001	OVERALL ICS SYSTEM BLOCK DIAGRAM

In the table 6 the following color codes are applied:

- Green – process units match across listed overall documents
- Yellow – some discrepancies found, comments are provided accordingly
- Red – misalignments between listed overall documents and indicated against relevant process unit.

Conclusion: All process units shall be identical on all relevant documents, tagged and coded on the same manner.

6. Telecommunication System Overview

As stated above all documents relevant to Telecommunication System are reviewed and commented in respect of Integrated Automated Process Control System requirements.

6.1 Referenced documents

Within this section document reference is made to the documents listed in the table below. These documents may contain within them further references, not listed below, but they are taken into account, where applicable.

Table 7 - Telecommunication System Reference Documents

Document Number	*Description*	*BG*	*GR*
IGB-04-FEED-VII.1-Comm1	Overall Architecture of Telecommunication Systems	√	
IGB-04-FEED-VI.15-01	Structural diagram IAPCS Gas Pipeline on the Territory of Bulgaria	√	
IGB-04-FEED-II.3.6-03	Block Diagrams Telecom, BVs, System Block Diagram	√	
IGB-04-FEED-III.6-ALL	Block diagrams telecommunications system - GMS2 Stara Zagora	√	
IGB-04-FEED-IV.6-03	Block diagrams telecommunications system - Dimitrovgrad AGRS	√	
IGB-04-FEED-V.6-03	Block diagrams telecommunications system - Kardzhali AGRS	√	
IGB-04-FEED-VII.1_EXPL_NOTE	TECHNOLOGICAL CONNECTION – ORGANIZATION OF THE CONNECTIONS. EQUIPMENT OF THE CONNECTION SYSTEMS	√	
IGB-04-FEED-VII.4_EXPL_NOTE	Part 4: OPTICAL INFRASTRUCTURE. EXTERNAL CONNECTIONS WITH OTHER TELECOMMUNICATION OPERATORS.	√	
IGB-04-FEED-VII.2-Comm	The logical topology of our network	√	
IGB-04-FEED-VII.2_EXPL_NOTE	A LOCAL AREA NETWORK (LAN). NETWORK INFRASTRUCTURE. EQUIPMENT	√	
10760-IN-00-01-001	OVERALL ICS SYSTEM SCHEMATIC		√
10760-IN-00-02-001	OVERALL ICS SYSTEM BLOCK DIAGRAM		√
10760-IN-ST-01-001	OVERALL SCADA CONTROL SYSTEM SCHEMATIC		√
10760-IN-ST-01-002	OVERALL TELECOMMUNICATION SYSTEM SCHEMATIC		√
10760-IN-ST-02-001	OVERALL TELECOMMUNICATION SYSTEM BLOCK DIAGRAM		√
10760-RPT-IN-ST-002	Telecommunications System Report		√
10760-SPC-IN-ST-007	Specification for Telecommunications System		√
10760-SPC-IN-ST-009	Specification for Telecommunications System Interface		√
10760-IN-M0-02-003	TYPICAL METERING STATION TELECOMMUNICATION SYSTEM BLOCK DIAGRAM		√
10760-IN-M0-02-004	TYPICAL AGRS STATION TELECOMMUNICATION SYSTEM BLOCK DIAGRAM		√

6.2 Overall analysis

The table below summarizes the design and concept for Bulgarian and Greek territory based on various major criteria's, listed in the first column.

Criteria Description	*Bulgarian Territory*	*Greek Territory*
Telecommunication System topology and overall architecture	• The document **IGB-04-FEED-VI.15-01 - Structural diagram IAPCS Gas Pipeline on the Territory of Bulgaria** – presents a mixed topology between 'star' and 'flattened ring'. Individual Fiber Optic links are shown from Dispatch center (DC) to each pipeline station, shown as 'star' topology. The second fiber optic link is shown as 'flattened ring', linking all pipeline stations sequentially. The same concept is described in Technical description documents: **IGB-04-FEED-VII.2_EXPL_NOTE - A LOCAL AREA NETWORK (LAN). NETWORK INFRASTRUCTURE. EQUIPMENT** and **IGB-04-FEED-VII.4_EXPL_NOTE - OPTICAL INFRASTRUCTURE. EXTERNAL CONNECTIONS WITH OTHER TELECOMMUNICATION OPERATORS**.	• The **Telecommunication System Report, document 10760-RPT-IN-ST-002,** describes the communication system structure in form of Main Communication Backbone and Back-up Communication System. The Main Communication Backbone shall use Fiber Optic Cable (FOC), while for the Back-up Communication System there are various recommendations, mainly focusing on Mobile Service Providers (GSM) or Leased Lines. The concept for the Back-up Communication System is not explored further in any other from the reviewed documents
	• The document **IGB-04-FEED-VII.1-Comm1 - Overall Architecture of Telecommunication Systems** – is sufficiently descriptive and presents the 'flattened ring' topology, linking all pipeline stations sequentially in a geographical order. The backbone fiber optic network is presented in form of Main and Spare fiber optic cables, running all together through the whole Gas Pipeline. A third party Fiber Optic cable is shown to the DC only for an External Internet and VoIP service provider. The Process Automation network on all pipeline stations, except DC, is shown outside of the Routers (Figure 6-2), means that the Process Automation system should have own network equipment, independent from	• Both documents – **10760-IN-ST-01-002 and 10760-IN-ST-02-001, Overall Telecommunication System Schematic and Block Diagram** – are identical in terms of telecommunication system topology and present the 'flattened' ring topology. Two separate fiber optic cables are shown, connecting all pipeline stations in 'odd / even' sequence, following the geographical order. Two separate sets of network equipment is foreseen in DC, for connection of both – 'odd' and 'even' – links.

Criteria Description	*Bulgarian Territory*	*Greek Territory*
	other networks, connected to dedicated fiber optic cores, foreseen for this purpose. The Process Automation network in DC is shown inside of the Routers (Figure 6-1), which contradicts with the concept followed on all pipeline stations. • All individual telecommunication block diagrams, as listed in Table 7 above, show that Process Control System is inside of the IP Node (means Router) as well as 3 (three) independent Fiber Optic Cables for each individual Fiber optic patch panel at each pipeline station.	• All typical pipeline station telecommunication system block diagrams, as listed in Table 7 above, follow the same concept as presented in all reviewed telecommunication documents.
Ring topology and/or Star topology	Referenced technical description documents (**IGB-04-FEED-VII.2_EXPL_ NOTE and IGB-04-FEED-VII.4_EXPL_ NOTE**) describe mixed topology between 'star' and 'flattened ring'. The same concept is presented in the logical topology of the network, document **IGB-04-FEED-VII.2-Comm**.	All documents are presenting 'flattened ring' topology and concept, by running separate fiber optic cables, connecting all pipeline stations in 'odd / even' sequence
Communication System Structure	Technical documents clearly describe that the telecommunication system structure should be based on backbone fiber optic network in form of Main and Spare fiber optic cables. Document **IGB-04-FEED-VII.2_EXPL_ NOTE** states that to ensure availability in the order of 99.99%, the logical structure of the network is based on a combination of 'star' and 'ring' topology with reserved optical lines and routers. Such a physical topology of the communications network provides maximum reliability, availability and viability.	The **Telecommunication System Report, document 10760-RPT-IN-ST-002,** describes the communication system structure in form of Main Communication Backbone and Back-up Communication System
Requirements on telecommunication	Some requirement can be assumed from the **IGB-04-FEED-VII.1-Comm1 - Overall**	The requirements described are that all services shall interface directly with

Criteria Description	*Bulgarian Territory*	*Greek Territory*
system concept in respect of Integrated Automated Process Control System demands	**Architecture of Telecommunication Systems**, where different approaches are presented: - Dedicated fiber optic cores, foreseen for the Automated Process Control System, means that the process automation system vendor shall foresee its own network equipment for connection to the dedicated fiber optic cores. The approach is presented on all pipeline stations except DC - The concept presented in DC implies interface through VLANs built in the Ethernet FOC system. The same concepts are described in the following documents: - **IGB-04-FEED-VII.2_EXPL_NOTE - A LOCAL AREA NETWORK (LAN). NETWORK INFRASTRUCTURE. EQUIPMENT** describes that the network segment into DC is split over various VLANs and one should be foreseen for process network with data from technological processes (including SCADA, fire alarm and extinguishing, monitoring and process alarms). - **IGB-04-FEED-VII.4_EXPL_NOTE - OPTICAL INFRASTRUCTURE. EXTERNAL CONNECTIONS WITH OTHER TELECOMMUNICATION OPERATORS** describes that the 'star' topology is applied to increase the reliability and confidentiality. Fiber optic cores to each object are distributed as follows - two fibers are planned for SCADA and two fibers are for other systems such as: telephony, video surveillance, access control, office applications etc.	VLANs built over the Ethernet FOC system.

Criteria Description	*Bulgarian Territory*	*Greek Territory*
Fiber Optic Cable Characteristics	Single mode fiber is selected as ITU-T G.655 optimized for use at wavelength in a prescribed region between 1530nm and 1565nm and which is used for long distance communication Reference document:IGB-04-FEED-II.4.2 FOC consist of 96 fibers with length of 163km for BG territory	Single mode fiber is selected as ITU-T G.655 optimized for use at wavelength in a prescribed region between 1530nm and 1565nm and which is used for long distance communication 10760-SPC-IN-ST-002-Rev2 FOC consist of 96 fibers with total length more than 182km
Fiber Optic Cable installation methods	Blowing the FOC into HDPE conduit – cable jet method Reference document:IGB-04-FEED-II.4.2	Blowing the FOC into HDPE conduit – cable jet method Reference document: 10760-SPC-IN-ST-002-Rev3

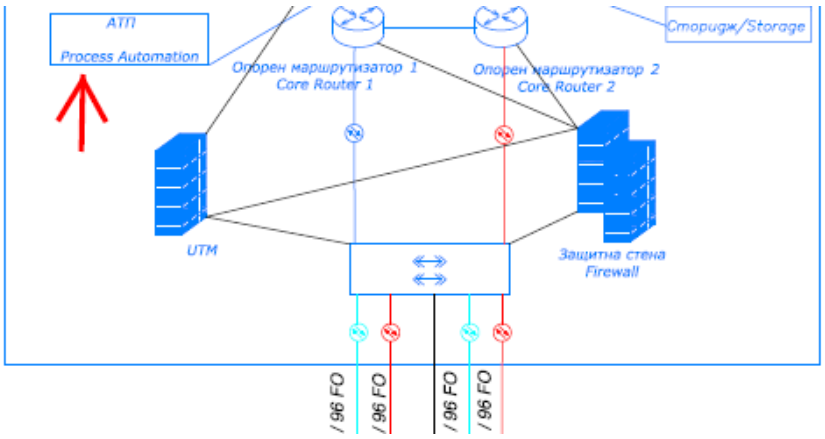

Figure 6-1 - Dispatch Center Process Automation Network

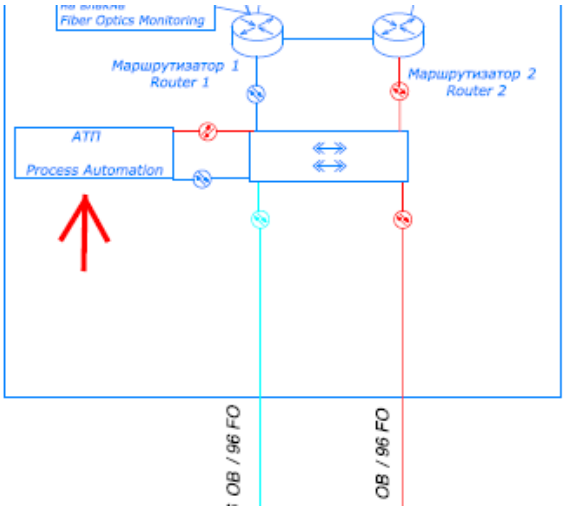

Figure 6-2 - Pipeline Station Process Automation Network

6.3 Conclusions

There are numerous misalignments in the Telecommunication System concept between design documentation developed for Bulgarian and Greek territory. Moreover some discrepancies have been found within various documents, developed for Bulgarian territory. As a summary:

- The documentation related for the Greek territory contains FEED documents descriptions and few typical drawings and block diagrams covering all typical pipeline stations. Whereas the documentation related for the Bulgarian territory is sufficiently descriptive, based thoroughly on quite detailed drawings and block diagrams for each pipeline station with explanation notes/documents. Therefore comparing the documentation one by one is

impossible. The analysis is based on the concept described end extracted from various types of documents.

- No unified concept – different conceptual approaches are described in terms of topology, communication system structure and overall architecture
- The requirements in respect of Integrated Automated Process Control System demands are slightly misaligned in various explanation documents related to Bulgarian section.
- Misalignments with regards to FOC installation methods. The FOC will be laid in HDPE conduit in the same trench of gas pipe in Greece. Two HDPE conduits will be installed in parallel to the pipeline, one for the implementation of the FOC and one spare. The FOC for Bulgarian territory should be laid on two optical cables: main cable is at a distance of 7 m on the right side of the gas pipeline axis (in a separate trench) and backup cable laid in the same trench of gas pipe. Three HDPE conduits will be installed in parallel to the pipeline on Bulgaria – two of them at distance of 7m (main and backup) and the third in the same trench of gas pipe.

6.4 Recommendations

The following recommendation could be taken into account in establishment of unified concept. The recommendations are thoroughly based on the requirements from the Automated Process Control System:

- **Fiber Optic Cable Characteristics** – this requirement is not explicitly dictated from the Automated Process Control System, but without having unified criteria's no other requirements could be achieved. The selection of the FOC should be based on the overall demanded data throughput, the mode of the data transmission, the technique of laying and the number of fibers and/or fiber groups. The FOC characteristics shall be fully identical in terms of specified dispersion, attenuation, cladding and coating diameters, cut off wavelength etc.
- **Telecommunication System topology** – the backbone network should be designed based on the interfaces and data transmission demands between the

DC and all pipeline stations. In case of requirements of interfaces and peer-to-peer data exchange between different pipeline stations, without interfering the DC, the same should be achieved from the backbone network. In respect of Automated Process Control System, the telecommunication system shall provide transparent transport of data and LAN.

- **Redundancy requirements** – modern Automated Process Control Systems are based on redundant network, ensuring high reliability and robust communication. The backbone network shall achieve this requirement, providing:
  - Required redundant communication pats, e.g. primary/secondary, duplicated network, etc.
  - Switchover requirements – wherever is required switchover timeout shall be ensured without suffering any loss of communications.
- **Data throughput** – the backbone network and all relevant network equipment shall achieve Automated Process Control System data throughput requirements. The requirements shall be based on the Automated Process Control System interfaces demands. As per document IGB-04-FEED-VII.2_EXPL_NOTE, network speed limits are described to be:
  - 10 Gbps for main backbone network or uplinks from individual nodes to Dispatch Center
  - Maximum of 1 Gbps for each LAN segment/individual node

Figures given above are sufficient to meet the requirements of the modern Automated Process Control Systems.

7. SCADA System Overview

7.1 Referenced documents

Within this section document reference is made to the documents listed in the table below. These documents may contain within them further references, not listed below, but they are taken into account, where applicable.

Table 8 - SCADA System Reference Documents

Document Number	*Description*	*BG*	*GR*
10760-IN-ST-01-001	OVERALL SCADA CONTROL SYSTEM SCHEMATIC		√
10760-PHL-PR-00-002	Overall Process Description		√
10760-RPT-IN-ST-001	SCADA System Integration Report		√
10760-SPC-IN-00-008	Specification for ICS System Requirements		√
10760-SPC-IN-ST-005	Specification for SCADA Systems		√

As per above table there are no overall and/or specific SCADA System documents for the Bulgarian part. Listed above documents could be used as overall documents for the whole interconnection pipeline.

The document 10760-SPC-IN-ST-005, Specification for SCADA Systems describes precisely the overall requirements for the SCADA system. The key topics need to be highlighted are:

- **Terminology alignment** – as stated in various documents 'at a lower level the SCADA System will be local Station Control Systems used to oversee the operations within each Metering and Automated Gas Regulating Stations, providing control, monitoring and data acquisition functions only for the dedicated station. The Station Control Systems (SCS) shall only consolidate data for supervisory monitoring purposes and only executes local commands'. The Station Control Systems (SCS) shall incorporate both the Process Control System (PCS) and Emergency Shutdown System (ESD) (including Fire and Gas Detection System). This will form the Integrated Control and Safety (ICS) system for monitoring of the metering and regulating facilities. The same is clearly described in 10760-SPC-IN-00-008, Specification for ICS System Requirements. In various documents it is allowed to be selected highly reliable Distributed Control System (DCS) or Programmable Logic Controller (PLC), e.g. refer to 10760-RPT-IN-ST-001, SCADA System Integration Report, section 5.2.1.2. It is

dependent on the number of I/O at each station and the control function involved. At stations as block valves, where the number of I/Os and control functions and algorithms are less the PCS and ESD become unnecessary. At these stations PLC technology would be sufficient. Following what has been described here, the most appropriate terminology is Integrated Automated Process Control System, rather than simply SCADA system. Or saying other way around the SCADA system shall be capable of being DCS system. The purpose of this requirement is so that complex stations such as Metering and Automated Gas Regulating Stations can be controlled by the same system. A PLC system is not adequate for this requirement due to inherent inadequacies of a PLC based system.

- **Other Dispatching Centers** – the requirement of more than one dispatch center is described in various documents for Bulgarian and Greek territory (e.g. 10760-SPC-IN-ST-005, Section 5.11, IGB-04-FEED-VII.2, Overall requirements), but the same is not shown neither in any System Overall Architectures nor in any System Block Diagrams. At such type of documents only one dispatch center is present – DC Haskovo, named as Main Control Center (MCC)

7.2 Typical Block Valve/Scrapper Station

7.2.1 Referenced documents

Within this section document reference is made to the documents listed in the table below. These documents may contain within them further references, not listed below, but they are taken into account, where applicable.

Table 9 - Typical Block Valve/Scrapper Station Reference Documents

Document Number	*Description*	*BG*	*GR*
IGB-04-FEED-II.3.6-03	Block Diagrams Telecom, BVs, System Block Diagram	√	
IGB-04-FEED-VII.2.1_EXPL_NOTE	PART 2.1: VALVE BLOCKS	√	
IGB-04-FEED-II.3.6-03-06_08-19	Block Diagrams system for control - Valve Station	√	
IGB-04-FEED-II.3.6-03-06_08-19	Block Diagrams systems - Valve Station	√	
10760-IN-B0-01-001	TYPICAL BLOCK VALVE/SCRAPER STATION - CONTROL SYSTEM SCHEMATIC		√
10760-LST-IN-A0-001	I/O List Typical Pigging Station		√
10760-LST-IN-B0-001	I/O List Typical Block Valve Station		√

7.2.2 Block Valve/Scrapper Station analysis

The table below summarizes the design and concept for Bulgarian and Greek territory based on various major criteria's, listed in the first column.

Criteria Description	*Bulgarian Territory*	*Greek Territory*
I/O Count Analysis	No I/O count has been found in Technical documentation for Bulgarian section	Two I/O Counts – one for Pigging station and one for the Valve Station as typical approach. The allocation of hardwired I/Os for Pigging Station is spread over following systems: - SCADA; - RTU Incorrect allocation to SCADA as SCADA system is typically not capable to handle hardwired I/O signals, this is through relevant RTUs interfaced to SCADA system. Identical for the allocation of hardwired I/Os for Valve Station: - Fire Panel;

Criteria Description	*Bulgarian Territory*	*Greek Territory*
		- SCADA - SCS/SCADA - Security Panel As per the 10760-IN-B0-01-001, TYPICAL BLOCK VALVE/SCRAPER STATION - CONTROL SYSTEM SCHEMATIC, there are other subsystems interconnected to the Valve Station's RTU (assume hardwired signals, although not specified explicitly) – e.g. Leak Detection System, UPS system, etc. The same type of systems are not listed and referenced in I/O count.
Requirements for RTU/PLC/DCS System	Block Diagrams IGB-04-FEED-II.3.6-03 presents approach with Integrated Control and Safety (ICS) system consisting of PCS and ESD systems, although the same segregation cannot be seen from I/O count	The 10760-IN-B0-01-001, TYPICAL BLOCK VALVE/SCRAPER STATION - CONTROL SYSTEM SCHEMATIC presents approach with RTU, interfaced to the SCADA served at the MCC
Basic operation requirements	The station is classified as Unmanned, although in Block Diagrams IGB-04-FEED-II.3.6-03 present Engineering/Operator station	The station is classified as Unmanned as per 10760-RPT-IN-ST-001, SCADA System Integration Report, Section 5.6, therefore no Engineering/Operator stations are foreseen in typical control system schematics

7.2.3 Block Valve/Scrapper Station Conclusions

There are misalignments with respect of the requirements for RTU/PLC/DCS system as well as the basic operation requirements between FEED for Greek section and Technical Design for Bulgarian section.

7.2.4 Block Valve/Scrapper Station Requirements

The small amount of I/Os leads to approach with RTU/PLC in Valve Stations with no local Engineering/Operator stations.

7.3 Typical Metering Station

7.3.1 Referenced documents

Within this section document reference is made to the documents listed in the table below. These documents may contain within them further references, not listed below, but they are taken into account, where applicable.

Table 10 – Typical Metering Station Reference Documents

Document Number	*Description*	*BG*	*GR*
IGB-04-FEED-III.6-03	Block diagrams systems - GMS2 Stara Zagora	√	
IGB-04-FEED-VII.2.2_EXPL_NOTE	Part 2.2: AGRS AND GMS	√	
IGB-04-FEED-III.6-09	I/O List Typical Gas Metering Station	√	
10760-IN-M0-01-001	TYPICAL METERING STATION - CONTROL SYSTEM SCHEMATIC		√
10760-LST-IN-M0-001	I/O List Typical Gas Metering Station		√

7.3.2 Metering Station analysis

The table below summarizes the design and concept for Bulgarian and Greek territory based on various major criteria's, listed in the first column.

Criteria Description	*Bulgarian Territory*	*Greek Territory*
I/O Count Analysis	The I/O count - IGB-04-FEED-III.6-09 - stands for GMS Stara Zagora, although the document description stands for Typical. The allocation of hardwired I/Os for Metering Station is spread over following systems: - SCS - SCS/SCADA; - SCADA - ESD - PSD - FC - F&G - Fire Panel - Security Panel	Similar with the I/O count for Bulgarian territory, although the I/O count 10760-LST-IN-M0-001, refers to the same GMS Stara Zagora

Criteria Description	*Bulgarian Territory*	*Greek Territory*
	Incorrect allocation to SCADA as SCADA system is typically not capable to handle hardwired I/O signals, this is through relevant ESD, PCS, F&G, etc. controllers.	
Requirements for RTU/PLC/DCS System	Block Diagrams IGB-04-FEED-III.6-03 presents approach with Integrated Control and Safety (ICS) system consisting of PCS and ESD systems	Identical approach as per 10760-IN-M0-01-001
Basic operation requirements	The station is classified as Unmanned, although in Block Diagrams IGB-04-FEED-III.6-03 present Engineering/Operator workstation and Supervisory Flow Computers	Identical

7.3.3 Metering Station Conclusions

The philosophy is identical for both – Bulgarian and Greek - sections.

7.3.4 Metering Station Requirements

The amount of I/Os leads to approach with ICS system with local Engineering/Operator stations.

7.4 Typical AGRS Station

7.4.1 Referenced documents

Within this section document reference is made to the documents listed in the table below. These documents may contain within them further references, not listed below, but they are taken into account, where applicable.

Table 11 – Typical Metering Station Reference Documents

Document Number	*Description*	*BG*	*GR*
IGB-04-FEED-V.6-03	Block diagrams telecommunications system - Kardzhali AGRS	√	
IGB-04-FEED-VII.2.2_EXPL_NOTE	Part 2.2: AGRS AND GMS	√	
IGB-04-FEED-IV.6-03	I/O List Typical Automated Gas Regulating Station	√	
10760-IN-M0-01-002	TYPICAL AGRS STATION - CONTROL SYSTEM SCHEMATIC		√
10760-LST-IN-M0-002	I/O List Typical Automated Gas Regulating Station		√

7.4.2 AGRS Station analysis

The table below summarizes the design and concept for Bulgarian and Greek territory based on various major criteria's, listed in the first column.

Criteria Description	*Bulgarian Territory*	*Greek Territory*
I/O Count Analysis	The I/O count - IGB-04-FEED-III.6-09 - stands for Dimitrovgrad AGRS, although the document description stands for Typical. The allocation of hardwired I/Os for AGRS Station is spread over following systems: - SCS - SCS/SCADA; - SCADA - ESD - PSD - FC - F&G - Fire Panel - Security Panel Incorrect allocation to SCADA as SCADA system is typically not capable to handle	Similar with the I/O count for Bulgarian territory, although the I/O count 10760-LST-IN-M0-001, refers to the same Dimitrovgrad AGRS. There is no AGRS on the Greek territory.

Criteria Description	*Bulgarian Territory*	*Greek Territory*
	hardwired I/O signals, this is through relevant ESD, PCS, F&G, etc. controllers.	
Requirements for RTU/PLC/DCS System	Block Diagrams IGB-04-FEED-V.6-03 presents approach with Integrated Control and Safety (ICS) system consisting of PCS and ESD systems	Identical approach as per 10760-IN-M0-01-002
Basic operation requirements	The station is classified as Unmanned, although in Block Diagrams IGB-04-FEED-V.6-03 present Engineering/Operator workstation and Supervisory Flow Computers	Identical

7.4.3 AGRS Station Conclusions

The philosophy is identical for both – Bulgarian and Greek - sections.

7.4.4 AGRS Station Requirements

The amount of I/Os leads to approach with ICS system with local Engineering/Operator stations.

8. SCADA System Overall Requirements

This section describes the general requirements required for a scalable Supervisory Control and Data Acquisition (SCADA) system. For the purposes of this specification, a scalable SCADA is defined as one that provides a robust, secure, cost-effective, and flexible solution with easy-to-use hardware and software.

The SCADA shall perform as a minimum the following functions as defined in the specific sections of this specification:

- Data Acquisition and control from/to a variety of RTU, DCS, F&G and Safety controllers
- Integrated Alarms and Events
- User friendly Operator Interface
- Historization
- Detailed trending
- Report generation
- Data exchange with other systems
- Redundancy
- Security system integration
- Building control system integration
- Video system integration

8.1 SCADA Architecture

The SCADA architecture shall be based around a modular computer network, utilizing industry standard operating systems, networks and protocols.

A true client-server approach shall be used. A Global Database Server shall service multiple clients such as Operator Interface units. Multiple copies of the same database stored in local Operator Interface units are not acceptable.

The architecture shall include support for various Wide Area Networks using standard hardware and software to link nodes into a single integrated SCADA. The SCADA shall also support a fully functional graphical interface for remote configuration and operation.

The SCADA system shall be capable of being a DCS system. The purpose of this requirement is so that complex stations such as GMS, AGRS, valve stations and other complex stations can be controlled by the same system. A PLC system is not adequate for this requirement due to inherent inadequacies of a PLC based system.

The SCADA shall support a scalable architecture for future expansions. It shall be possible to add additional controllers and Operator Interfaces without the need for additional database servers or I/O servers. Expansions to database sizing shall be simple (such as entering a new authorization code) and shall not require additional software installation. In addition, the SCADA shall allow communications with a wide variety of control devices utilizing off the shelf driver packages.

In Normal operation, the pipeline will be operated from a main control room. This control room will operate many different types of stations over a diverse geography.

In the event of a failure a disaster recovery process shall be kicked off. Refer to the section below that describes this.

Design station automation such that the station can operate autonomously when communications to Central control room (SCADA Host) are unavailable.

Minimal dependency between stations so that the overall gas transport service is maximized in the event of unavailability of one station

8.2 Disaster Operational Requirements

In the event of a disaster a number of processes need to be able to be implemented by the SCADA system. These failure modes and the operational requirements are discussed below.

1. Failure of communications to a single station (or loss of that station)
   a. Redundant communication paths for critical stations. SCADA system must be able to accept redundant communication paths with varying network bandwidths and latencies.
   b. If redundant communication paths are not available for a particular station then stations upstream and downstream of the failed station are still able to be controlled to bring pipeline to a safe state.
2. Failure of communications that segregates the pipeline – able to operate the stations locally – where central control is no longer available.
3. Failure of the Primary server – Backup server to automatically fail over and allow control of the pipeline.
4. Failure of the Primary and secondary server – Able to operate the pipeline from the Emergency Control Centre.
5. Failure of the Primary, secondary and Emergency Control Server – able to operate each station locally.

8.3 Communication Networks

8.3.1 Client/Server Network

The open technologies of Ethernet and TCP/IP shall be supported for communication between the Server and the Operator Interfaces.

The Server and its associated Operator Interfaces must be capable of connecting to two fully redundant industrial Ethernet networks. This network should be capable of multiple failures and have an extremely fast fail over time. The industrial network should be monitored by the system and failures should alarm on the system.

Any single fault on the redundant supervisory network must not cause any interruption in control or loss of view and be diagnosable to the control system within 2 seconds.

This Ethernet network shall be open to allow third party devices and other PCs to be connected for communication with the Server and Operator Interfaces. A network reserved solely for the Server and Operator Interfaces is unacceptable.

Supervisory network must be able to diagnose and alarm the operator on supervisory network problems such as CPU overloading, low disk space, overloaded network traffic, etc. and the conditions to be alarmed should be configurable on per condition basis.

8.3.2 Controller Networks

A variety of networking and communications standards will be supported to interface with controllers.

8.4 SCADA Functional Requirements

8.4.1 Server

The Server shall be based around the Microsoft Windows Professional/Server 64-bit multi-tasking environment. The server shall be a true 64-bit application that takes advantage of Microsoft Windows enabling technologies. Any 16-bit or 32-bit system running on the Microsoft Windows platform (such as those originally based on MS-DOS and Microsoft Windows 3.x) is not acceptable.

The Server shall be capable of utilizing Microsoft Windows support for symmetric multi-processing, to enable operation on machines with more than one processor.

The Server shall be integrated with the startup services of Microsoft Windows. Logon to Microsoft Windows shall not be required for the Server to startup and run. The Microsoft Windows event viewer shall be available to analyze startup and shutdown of the Server.

8.4.2 Server Redundancy

The SCADA shall be capable of running a pair of similarly configured Servers in a redundant configuration where at any instance, one is the Primary and the other is the Backup. An on-line database replication mechanism shall be provided. Fault tolerant hardware is not considered an acceptable alternative to redundant Servers, but may be used in addition to.

Failure of any one redundant part shall not interrupt other system functions. A failure can be a hardware failure, software failure, power supply failure or the loss of one AC feeder in a dual feeder system

All dual equipment and subsystems shall be continuously monitored for their integrity. Automatic and manual switchovers shall be displayed, logged and alarmed.

Redundant equipment hardware and software shall be continuously monitored for errors. Switchover to backup device shall occur automatically upon failure of primary device. It shall be possible to manually switchover (change from backup to active status) any redundant module

Simply scanning I/O on two separate systems and processing independently is not acceptable. The database replication must be performed on a per-transaction basis for two reasons:

1. To ensure that the replicated Backup database is consistent at all times with the Primary database
2. To avoid unnecessary loading of field devices caused by duplicate polling

It shall be possible to remove one of the redundant Servers for maintenance without interrupting operation, and upon its reinstatement, re-synchronize the databases via a push-button on the screen, again without interruption to SCADA operation. A simple method of manually initiating a fail-over shall be provided to assist with such maintenance operations.

It shall be possible to connect a serial data stream to a Terminal Server. On failing from the primary to the backup, the primary shall drop its connection to the Terminal Server and be re-established by the backup. This shall happen automatically in the event of a failure. It is not acceptable to disconnect a serial cable from the primary and re-connect it into the backup in the event of a failure. Redundant terminal servers shall be supported where dual communication channels are required.

Operator Interfaces must be capable of switching automatically between redundant Servers in the event of a fail-over, and switching between redundant Ethernets automatically in the event of an Ethernet failure.

Failure of either the primary or backup server shall be announced audibly and visually via the alarming subsystem.

Operator stations will be inherently "redundant", in that a failure of a single operator station will not affect the other operator stations, and all tags can be viewed from any operator station – subject to operator station area restriction configuration.

An operator station from one area can quickly be re-configured to another area if required – without a shut down or loss of view.

8.4.3 Database Requirements

The SCADA database shall be truly global. This means that only one Server database shall exist. Separate databases at each Operator Interface are not acceptable, neither can a database be loaded from a shared drive into the Operator Interface when it starts. The configuration of the Server database shall only have to be done once regardless of whether redundancy is employed or data is distributed between servers.

I/O signals and controller values for a single piece of the process shall be combined into a single point. For example, for a temperature loop, the PV (representing an analog input signal), OP (representing an analog output), SP (representing a controller value), and mode shall all be values of a single process point. Separate points for these values are not acceptable. Point detail displays showing values for the point shall be accessible by operators and engineers.

SCADA shall allow composite points, where a composite point is a tag that is broken up into discrete components, which are separated e.g. area.point. This allows better segregation of the plant components.

8.4.4 Controller Integration

The Server shall provide a comprehensive real-time database, incorporating analog, logical or pulse input data from controllers. The database shall be configurable by the end user without the need for any programming. Modification shall be done on-line without interrupting SCADA operation. In addition to point-based information, the database shall also provide historization capabilities for analog, digital, pulse and event based information. This information shall be accessible by all subsystems in the SCADA including standard displays, custom displays, reports, trends, and user written applications.

8.4.5 Historical Database

Historization of point data shall be configurable as part of the SCADA. Historization shall be provided for both snapshots and averages with intervals ranging from 1 second to

24 hours. Snapshots are instantaneous values taken at a certain period in time. Averages are derived from the instantaneous data.

There shall be only one central history database, stored on the redundant Server pair, accessible to all Operator Interfaces. Distributed databases stored on Operator Interfaces and other workstations are unacceptable.

Once assigned to history, point data shall be available by POINT.PARAMETER access used in conjunction with a history offset to locate the particular value of interest. The graphical Operator Interface, trends, reports, and application interfaces shall be able to access this historical data.

Modifications to the history collection of a point shall be possible on-line without the loss of previously collected data for the point being changed or any other points in the SCADA currently being historized.

8.4.6 Event Database

The Server shall maintain a journal containing the following event information:

- Alarms
- Alarm Acknowledgments
- Return to Normal
- Operator Control Actions
- Operator Login & Security Level Changes
- On-line Database Modifications
- Communications Alarms
- Server Restart Messages

Standard Displays shall be provided to view the current journal file with the most recent event at the top of the display. Subsequent page forward actions shall allow display of progressively older events. Sorting and filtering of the journal shall be possible via a standard report that shall be configurable by use of a fill-in-the-blank form. Coding or scripting of any kind shall not be required to achieve this task.

The Event Database entries shall contain the following information:

- Time & Date Stamp
- Point Name
- Event Type
- Alarm Priority
- Point Description
- New PV

- Engineering Units

The Event Database shall be accessible from other subsystems such as the Operator Interface, Report Generation and Application Programmer's Interface.

Data should be initially stored in an on-line database and transferred to an archival database when free space falls below a certain limit. The archival database shall have the ability to be backed up to Tape, CD-RW etc. The ability to backup and restore archival data shall be from a display that is integrated with the Operator Interface.

There shall be only one central event database, stored on the redundant Server pair, accessible to all Operator Interfaces. Distributed databases stored on Operator Interfaces and other workstations are unacceptable.

8.5 Operator Interface

The Operator workstations shall function as the main human-machine interface for all SCADA system functions, including, as a minimum:

- Logging on as an operator or engineer shall be via an appropriate level of security access
- Alarm, event log, trending, archiving and display, storage and print facilities
- System diagnostic screens
- Engineer console functionality for complete system
- Graphic displays showing equipment status and process values
- Manual and automatic control of field equipment
- Monitoring, control, and manual and auto-tuning of process control loops
- Activation and alarming of start-up process bypasses in the ESD system
- Provision for maintenance bypass and corresponding "alert alarm" logging
- Trip logs, shift logs and periodical logs
- Report generator software
- Simple data exchange with Microsoft applications including Excel and Access
- Multiple windowing of displays
- Each workstation shall have access to all graphics and tags
- Workstations shall be configurable to prevent control of areas from workstations not normally assigned to that area
- It shall provide a consistent framework for viewing information.
- Critical objects (such as alarm icons) shall be visible at all times. A predefined region, visible at all times shall provide operator messaging. A set of standard displays for configuration, and navigation around the SCADA shall

be provided. These shall be independent of any custom (process specific) display.

- The Operator Interface shall be interactive and completely graphics and/or icon based. Graphics shall be capable of supporting at least 16bit color at a minimum 1024 x 768 pixel resolution.
- Operator interface shall support up to four 19" or larger Flat Panel Display (FDP) simultaneously using one common keyboard and mouse/trackball.
- The Operator Interface shall be windows based and shall employ standard Windowing conventions so as to reduce required Operator training. In particular, standard tool bar icons and drop-down menus shall be available on all standard and custom displays to allow easy access to common functions. Similarly, such functions shall also be available via a standard set of Function-Key based push buttons without requiring configuration.
- The Operator Interface shall support the ability to "full screen lock" the window so that users can't access other applications. If "full screen lock" is not enabled, support for copy and paste facilities shall be provided between the operator window and other applications via the Windows clipboard.
- Support for customizable Windows Help files and case-sensitive html shall be provided for use as plant operator instructions.
- SCADA should have the ability to create custom displays. These user-configured displays shall be constructed using the integrated display building functions available through the Operator Interface.
- Update rates of 1 second shall be achievable on the Operator Interfaces (up to 300 parameters per graphic)
- Operator Stations shall support either Static or Rotary connection. A static connection to the server provides a permanent, dedicated link. A rotary connection provides an "as required" connection, enabling numerous causal users to access the system as needed. Up to 60 stations shall be supported per server as static station.

9. Appendix A – List of Technical Design Documentation for the Bulgarian Section

Volume	Sub volume	Part	Section	Name	Drawing/Document number	Rev
I				GENERAL DOCUMENTATION		
II				SUBPROJECT: TRANSMISSION GAS PIPELINE - IGB		
	1			LINEAR LOTS		
	3			VALVE STATIONS		
		1		MASTERPLAN AND VERTICAL PLANNING	IGB-04-FEED-II.3.1	00
		2		TECHNOLOGICAL PART AND TECHNOLOGICAL PIPELINES	IGB-04-FEED-II.3.2	00
		3		ARCHITECTURAL	IGB-04-FEED-II.3.3	00
		4		STRUCTURAL	IGB-04-FEED-II.3.4	00
		5		ELECTRICAL PART	IGB-04-FEED-II.3.5	00
		6		PROCESS AUTOMATION	IGB-04-FEED-II.3.6	00
				Valve block BV2, BV3A, BV4, BV4A and BV6 – Site installations	IGB-04-FEED-II.3.6-01 sheet 1	00
				Valve block BV5 and BV7 - Site installations	IGB-04-FEED-II.3.6-01 sheet 2	00
				Symbols and legend. Pipelines and equipment	IGB-04-FEED-II.3.6-02 sheet 1	00
				Symbols and legend. Pipelines and equipment	IGB-04-FEED-II.3.6-02 sheet 2	
				Valve block BV2, BV3A, BV4, BV4A and BV6 - P&ID	IGB-04-FEED-II.3.6-03 sheet 1	00
				Valve block BV5 and BV7 - P&ID	IGB-04-FEED-II.3.6-03 sheet 2	00
				Control block diagram - Valve block	IGB-04-FEED-II.3.6-04	00
				Systems block diagram - Valve block	IGB-04-FEED-II.3.6-05	00
				Telecommunications block diagram - Valve block	IGB-04-FEED-II.3.6-06	00
				Symbols and legend. Standard actuators of valves.	IGB-04-FEED-II.3.6-07	00
				Connection schemes of control - Valve block BV2, BV3A, BV4, BV4A and BV6	IGB-04-FEED-II.3.6-08 sheet 1	00
				Connection schemes of control - Valve block BV5 and BV7	IGB-04-FEED-II.3.6-08 sheet 2	00
				Installations equipment. Details: Terminal switchboard and cable terminals	IGB-04-FEED-II.3.6-09	00
				Installations equipment. Details: mounting plate for single terminal switchboard	IGB-04-FEED-II.3.6-10	00
				Installations equipment. Details: 60 terminal switchboard. Spark protected	IGB-04-FEED-II.3.6-11	00
				Installations equipment. Details: 60 terminal switchboard. Not spark protected	IGB-04-FEED-II.3.6-12	00
				Installations equipment. Details: Standard element for earthing of blast proof circuit.	IGB-04-FEED-II.3.6-13	00
				Installations equipment. Details: standard element for earthing of spark-protected circuits	IGB-04-FEED-II.3.6-14	00
				Installations equipment. Details: standard element for marking of circuits	IGB-04-FEED-II.3.6-15	00
				Installations equipment. Details: Standard boards for equipment	IGB-04-FEED-II.3.6-16	00
				Installations equipment. Details: Standard detail for mounting of cable tray	IGB-04-FEED-II.3.6-17	00
				Installations equipment. Details: Cable layout of switchboards	IGB-04-FEED-II.3.6-18	00

Volume	Sub volume	Part	Section	Name	Drawing/Document number	Rev
				Installations equipment. Details: Profiles for cable laying	IGB-04-FEED-II.3.6-19	00
				BILL OF QUANTITIES	IGB-04-FEED-II-3.6-BILQN	00
		7		**HVAC (Heating, Ventilation, Air Conditioning)**	IGB-04-FEED-II.3.7	00
	4			**TECHNOLOGICAL FIBRE OPTIC CABLE LINE**		
		1		GEODESY	IGB-04-FEED-II.4.1	00
		2		TECHNOLOGICAL FIBRE OPTIC COMMUNICATION LINE	IGB-04-FEED-II.4.2	00
				IGB-04-FEED-II.4.2-01-Kol. s-ka- 1-1, pril1-osn	IGB-04-FEED-II.4.2	
				IGB-04-FEED-II.4.2-01-Kol. s-ka pril 1,1-2-res	IGB-04-FEED-II.4.2	
				IGB-04-FEED-II.4.2-02-KV 3a-s-ka2-2,pril2	IGB-04-FEED-II.4.2	
				IGB-04-FEED-II.4.2-02-KV 4-s-ka2-3,pril 2	IGB-04-FEED-II.4.2	
				IGB-04-FEED-II.4.2-02-KV 6-s-ka2-6,pril2	IGB-04-FEED-II.4.2	
				IGB-04-FEED-II.4.2-04-KV 2-s-ka2-1,pril2	IGB-04-FEED-II.4.2	
				IGB-04-FEED-II.4.2-04-KV 4a-s-ka2-4,pril2	IGB-04-FEED-II.4.2	
				IGB-04-FEED-II.4.2-04-KV 5-s-ka2-5,pril2	IGB-04-FEED-II.4.2	
				IGB-04-FEED-II.4.2-04-KV 7-s-ka2-7,pril2	IGB-04-FEED-II.4.2	
				IGB-04-FEED-II.4.2-05-Kol s-ka -3-2,pril 3-res	IGB-04-FEED-II.4.2	
				IGB-04-FEED-II.4.2-05-Kol-s-ka 3-1,pril 3-osn	IGB-04-FEED-II.4.2	
				Cable line-Situacia	IGB-04-FEED-II.4.2-01	00
				Block sheme	IGB-04-FEED-II.4.2-02-01	00
				Channel set-block sheme	IGB-04-FEED-II.4.2-02-02	00
				Cross profile	ICGB-04-FEED-II.4.2-03-01	00
				Details- longitudinal profile of crossing with gas pipeline	ICGB-04-FEED-II.4.2-03-02	00
				Details-longitudinal profile of crossing with existing CC	ICGB-04-FEED-II.4.2-03-03	00
				Details- longitudinal profile of crossing with water supply line	ICGB-04-FEED-II.4.2-03-04	00
				Details-longitudinal profile of crossing with elektrical cable	ICGB-04-FEED-II.4.2-03-05	00
				Situation BV 2	ICGB-04-FEED-II.4.2-04 BV2	00
				Situation BV 3A	ICGB-04-FEED-II.4.2-04 BV3A	00
				Situation BV 4	ICGB-04-FEED-II.4.2-04 BV4	00
				Situation BV 4A	ICGB-04-FEED-II.4.2-04 BV4A	00
				Situation BV 5	ICGB-04-FEED-II.4.2-04 BV5	00
				Situation BV 6	ICGB-04-FEED-II.4.2-04 BV6	00
				Situation BV 7	ICGB-04-FEED-II.4.2-04 BV7	00
				Cable line-Situacia	ICGB-04-FEED-II.4.2-05	00
				Block sheme OC-main	ICGB-FEED-II.4.2-06-01	00
				Block sheme OC -reserve	ICGB-FEED-II.4.2-06-02	00
				Detail used for forming and attaching cable reserves in shaft	ICGB-FEED-II.4.2-07	00
		3		**STRUCTURAL PART**	IGB-04-FEED-II.4.3	00
III				**SUBPROJECT: GMS STARA ZAGORA**		
		1		**GEOLOGY SURVEY**	IGB-04-FEED-III.1	00
		2		**MASTER PLAN AND VERTICAL PLANNING**	IGB-04-FEED-III.2	01
		3		**TECHNOLOGICAL PART AND TECHNOLOGICAL PIPELINES**	**IGB-04-FEED-III.3**	01
		4		**ARCHITECTURAL**	IGB-04-FEED-III.4	00
		5		**STRUCTURAL**	IGB-04-FEED-III.5	01
		6		**PROCESS AUTOMATION**	IGB-04-FEED-III.6	01

Volume	Sub volume	Part	Section	Name	Drawing/Document number	Rev
				Gas Metering Station (GMS2) Stara Zagora- Site installations	IGB-04-FEED-III.6-01	01
				Symbols and legend. Pipelines and equipment	IGB-04-FEED-III.6-02 sheet 1	00
				Symbols and legend. Pipelines and equipment	IGB-04-FEED-III.6-02 sheet 2	00
				GMS Stara Zagora. Input collector - P&ID	IGB-04-FEED-III.6-03 sheet 1	00
				GMS Stara Zagora. Gas filter-separator A – P&ID	IGB-04-FEED-III.6-03 sheet 2	00
				GMS Stara Zagora. Gas filter-separator B – P&ID	IGB-04-FEED-III.6-03 sheet 3	00
				GMS Stara Zagora. Analyzing and measuring unit - P&ID	IGB-04-FEED-III.6-03 sheet 4	01
				GMS Stara Zagora. Regulating unit - P&ID	IGB-04-FEED-III.6-03 sheet 5	00
				GMS Stara Zagora. Station exit - P&ID	IGB-04-FEED-III.6-03 sheet 6	00
				GMS Stara Zagora. Gas heater A – P&ID	IGB-04-FEED-III.6-03 sheet 7	00
				GMS Stara Zagora. Gas heater B – P&ID	IGB-04-FEED-III.6-03 sheet 8	00
				GMS Stara Zagora. Closed drainage system – P&ID	IGB-04-FEED-III.6-03 sheet 9	00
				GMS Stara Zagora. Nitrogen installation– P&ID	IGB-04-FEED-III.6-03 sheet 10	00
				GMS Stara Zagora. Fuel gas system – P&ID	IGB-04-FEED-III.6-03 sheet 11	00
				GMS Stara Zagora. Hot water system – P&ID	IGB-04-FEED-III.6-03 sheet 12	00
				GMS Stara Zagora. Hot water system tank – P&ID	IGB-04-FEED-III.6-03 sheet 13	00
				GMS Stara Zagora. Pig launching and receiving station – P&ID	IGB-04-FEED-III.6-03 sheet 14	00
				I/O sheet – P&ID	IGB-04-FEED-III.6-03 sheet 15	01
				Block diagram of control and measurement systems- GMS2 Stara Zagora	IGB-04-FEED-III.6-04	01
				Connection diagram for measurement system - GMS2 Stara Zagora	IGB-04-FEED-III.6-05 (sheet1/2)	01
				Block diagram of systems - GMS2 Stara Zagora	IGB-04-FEED-III.6-06	01
				Block diagram of systems - GMS2 Stara Zagora	IGB-04-FEED-III.6-07	00
				Symbols and legend. Standard valve actuators	IGB-04-FEED-III.6-08	00
				Connection diagrams for control and measurement - GMS2 Stara Zagora	IGB-04-FEED-III.6-09 sheet 1	00
				Connection diagrams for control and measurement - GMS2 Stara Zagora	IGB-04-FEED-III.6-09 sheet 2	00
				Connection diagrams for control and measurement - GMS2 Stara Zagora	IGB-04-FEED-III.6-09 sheet 3	00
				Connection diagrams for control and measurement - GMS2 Stara Zagora	IGB-04-FEED-III.6-09 sheet 4	01
				Connection diagrams for control and measurement - GMS2 Stara Zagora	IGB-04-FEED-III.6-09 sheet 5	01
				Connection diagrams for control and measurement - GMS2 Stara Zagora	IGB-04-FEED-III.6-09 sheet 6	00
				Connection diagrams for control and measurement - GMS2 Stara Zagora	IGB-04-FEED-III.6-09 sheet 7	00
				Assembly equipment. Details: Terminal switchboard and cable entries	IGB-04-FEED-III.6-10	00
				Assembly equipment. Details: Prop for single terminal switchboard	IGB-04-FEED-III.6-11	00
				Assembly equipment. Details: Prop for terminal switchboards	IGB-04-FEED-III.6-12	00
				Assembly equipment. Switchboard with 60 terminals. Not spark protected.	IGB-04-FEED-III.6-13	00

Volume	Sub volume	Part	Section	Name	Drawing/Document number	Rev
				Assembly equipment. Details: Switchboard with 60 terminals. Spark protected.	IGB-04-FEED-III.6-14	00
				Assembly equipment. Details: Switchboard with 120 terminals. Spark protected.	IGB-04-FEED-III.6-15	00
				Assembly equipment. Details: terminal distribution board for relay installation	IGB-04-FEED-III.6-16	00
				Assembly equipment. Details: standard detail for grounding of blast-proof circuits	IGB-04-FEED-III.6-17	00
				Assembly equipment. Details: standard detail for grounding of spark-proof circuits	IGB-04-FEED-III.6-18	00
				Assembly equipment. Details: standard detail for circuit marking	IGB-04-FEED-III.6-19	00
				Assembly equipment. Details: standard board for equipment	IGB-04-FEED-III.6-20	00
				Assembly equipment. Details: standard detail for mounting of cable tray	IGB-04-FEED-III.6-21	00
				Assembly equipment. Details: cable arrangement of boards	IGB-04-FEED-III.6-22	00
				Assembly equipment. Details: cable laying elements	IGB-04-FEED-III.6-23	00
				BILL OF QUANTITIES	IGB-04-FEED-III.6-BQ	01
		7		**FIRE SAFETY**	IGB-04-FEED-III.7	01
		8		**ELECTRICAL**	IGB-04-FEED-III.8	02
		9		TECHNOLOGICAL CONNECTION SYSTEMS	IGB-04-FEED-III.9	00
				Site power cable-line. Situational plan.	IGB-04-FEED-III.9-01	00
				BILL OF QUANTITIES	IGB-04-FEEB-III.9-BQ	00
		10		**HVAC**	IGB-04-FEED-III.10	02
		11		**ENERGY EFFICIENCY**	IGB-04-FEED-III.11	01
		12		**SAFETY AND HEALTH PLAN**	IGB-04-FEED-III.12	00
		13		**WATER SUPPLY & SEWERAGE**	IGB-04-FEED-III.13	02
IV				**SUBPROJECT: AGRS DIMITROVGRAD**		
		1		**GEOLOGY SURVEY**	IGB-04-FEED-IV.1	00
		2		**MASTERPLAN AND VERTICAL PLANNING**	IGB-04-FEED-IV.2	01
		3		**TECHNOLOGICAL PART AND TECHNOLOGICAL PIPELINES**	IGB-04-FEED-IV.3	00
		4		**ARCHITECTURAL**	IGB-04-FEED-IV.4	01
		5		**STRUCTURAL**	IGB-04-FEED-IV.5	01
		6		**PROCESS AUTOMATION**	IGB-04-FEED-IV.6	00
				Gas Metering Station AGRS Dimitrovgrad- Site installations	IGB-04-FEED-IV.6-01	00
				Symbols and legend. Pipelines and equipment	IGB-04-FEED-IV.6-02 sheet 1	00
				Symbols and legend. Pipelines and equipment	IGB-04-FEED-IV.6-02 sheet 2	00
				AGRSD Dimitrovgrad. Input collector - P&ID	IGB-04-FEED-IV.6-03 sheet 1	00
				AGRSD Dimitrovgrad. Gas filter-separator A – P&ID	IGB-04-FEED-IV.6-03 sheet 2	00
				AGRSD Dimitrovgrad. Gas filter-separator B – P&ID	IGB-04-FEED-IV.6-03 sheet 3	00
				AGRSD Dimitrovgrad. Analyzing and measuring unit - P&ID	IGB-04-FEED-IV.6-03 sheet 4	00
				AGRSD Dimitrovgrad. Regulating unit - P&ID	IGB-04-FEED-IV.6-03 sheet 5	00
				AGRSD Dimitrovgrad. Station exit - P&ID	IGB-04-FEED-IV.6-03 sheet 6	00
				AGRSD Dimitrovgrad. Gas heater A – P&ID	IGB-04-FEED-IV.6-03 sheet 7	00
				AGRSD Dimitrovgrad. Gas heater B – P&ID	IGB-04-FEED-IV.6-03 sheet 8	00
				AGRSD Dimitrovgrad. Closed drainage system – P&ID	IGB-04-FEED-IV.6-03 sheet 9	00

Volume	Sub volume	Part	Section	Name	Drawing/Document number	Rev
				AGRSD Dimitrovgrad. Nitrogen installation– P&ID	IGB-04-FEED-IV.6-03 sheet 10	00
				AGRSD Dimitrovgrad. Fuel gas system – P&ID	IGB-04-FEED-IV.6-03 sheet 11	00
				AGRSD Dimitrovgrad. Hot water system – P&ID	IGB-04-FEED-IV.6-03 sheet 12	00
				AGRSD Dimitrovgrad. Hot water system tank – P&ID	IGB-04-FEED-IV.6-03 sheet 13	00
				I/O sheet – P&ID	IGB-04-FEED-IV.6-03 sheet 14	00
				Block diagram of control and measurement systems- AGRSD Dimitrovgrad	IGB-04-FEED-IV.6-04	00
				Connection diagram for measurement system - AGRSD Dimitrovgrad	IGB-04-FEED-IV.6-05	00
				Block diagram of systems - AGRSD Dimitrovgrad	IGB-04-FEED-IV.6-06	00
				Block diagram of telecommunication system- AGRSD Dimitrovgrad	IGB-04-FEED-IV.6-07	00
				Symbols and legend. Standard valve actuators	IGB-04-FEED-IV.6-08	00
				Connection diagrams for control and measurement - AGRSD Dimitrovgrad	IGB-04-FEED-IV.6-09 sheet 1	00
				Connection diagrams for control and measurement - AGRSD Dimitrovgrad	IGB-04-FEED-IV.6-09 sheet 2	00
				Connection diagrams for control and measurement - AGRSD Dimitrovgrad	IGB-04-FEED-IV.6-09 sheet 3	00
				Connection diagrams for control and measurement - AGRSD Dimitrovgrad	IGB-04-FEED-IV.6-09 sheet 4	00
				Connection diagrams for control and measurement - AGRSD Dimitrovgrad	IGB-04-FEED-IV.6-09 sheet 5	00
				Connection diagrams for control and measurement - AGRSD Dimitrovgrad	IGB-04-FEED-IV.6-09 sheet 6	00
				Connection diagrams for control and measurement - AGRSD Dimitrovgrad	IGB-04-FEED-IV.6-09 sheet 7	00
				Assembly equipment. Details: Terminal switchboard and cable entries	IGB-04-FEED-IV.6-10	00
				Assembly equipment. Details: Prop for single terminal switchboard	IGB-04-FEED-IV.6-11	00
				Assembly equipment. Details: Prop for terminal switchboards	IGB-04-FEED-IV.6-12	00
				Assembly equipment. Switchboard with 60 terminals. Not spark protected.	IGB-04-FEED-IV.6-13	00
				Assembly equipment. Details: Switchboard with 60 terminals. Spark protected.	IGB-04-FEED-IV.6-14	00
				Assembly equipment. Details: Switchboard with 120 terminals. Spark protected.	IGB-04-FEED-IV.6-15	00
				Assembly equipment. Details: terminal distribution board for relay installation	IGB-04-FEED-IV.6-16	00
				Assembly equipment. Details: standard detail for grounding of blast-proof circuits	IGB-04-FEED-IV.6-17	00
				Assembly equipment. Details: standard detail for grounding of spark-proof circuits	IGB-04-FEED-IV.6-18	00
				Assembly equipment. Details: standard detail for circuit marking	IGB-04-FEED-IV.6-19	00
				Assembly equipment. Details: standard board for equipment	IGB-04-FEED-IV.6-20	00

Volume	Sub volume	Part	Section	Name	Drawing/Document number	Rev
				Assembly equipment. Details: standard detail for mounting of cable tray	IGB-04-FEED-IV.6-21	00
				Assembly equipment. Details: cable arrangement of boards	IGB-04-FEED-IV.6-22	00
				Assembly equipment. Details: cable laying elements	IGB-04-FEED-IV.6-23	00
				BILL OF QUANTITIES	IGB-04-FEED-IV.6-BQ	00
		7		**FIRE SAFETY**	IGB-04-FEED-IV.7	01
		8		**ELECTRICAL**	IGB-04-FEED-IV.8	01
		9		TECHNOLOGICAL CONNECTION SYSTEMS	IGB-04-FEED-IV.9	00
				Site power cable-line. Situational plan	IGB-04-FEED-IV.9-01	00
				BILL OF QUANTITIES	IGB-04-FEEB-IV.9-BQ	00
		10		**HVAC**	IGB-04-FEED-IV.10	01
		11		**ENERGY EFFICIENCY**	IGB-04-FEED-IV.11	00
		12		**SAFETY AND HEALTH PLAN**	IGB-04-FEED-IV.12	00
		13		**WATER SUPPLY AND SEWERAGE**	IGB-04-FEED-IV.13	01
V				**SUBPROJECT: AGRS KARDJALI**		
		1		**GEOLOGY SURVEY**	IGB-04-FEED-V.1	00
		2		**MASTERPLAN AND VERTICAL PLANNING**	IGB-04-FEED-V.2	01
		3		**TECHNOLOGICAL PART AND TECHNOLOGICAL PIPELINES**	IGB-04-FEED-V.3	00
		4		**ARCHITECTURAL**	IGB-04-FEED-V.4	01
		5		**STRUCTURAL**	IGB-04-FEED-V.5	01
		6		**PROCESS AUTOMATION**	IGB-04-FEED-V.6	00
				Gas Metering Station AGRS Kardzhali- Site installations	IGB-04-FEED-V.6-01	00
				Symbols and legend. Pipelines and equipment	IGB-04-FEED-V.6-02 sheet 1	00
				Symbols and legend. Pipelines and equipment	IGB-04-FEED-V.6-02 sheet 2	00
				AGRS Kardzhali. Input collector - P&ID	IGB-04-FEED-V.6-03 sheet 1	00
				AGRS Kardzhali. Gas filter-separator A – P&ID	IGB-04-FEED-V.6-03 sheet 2	00
				AGRS Kardzhali. Gas filter-separator B – P&ID	IGB-04-FEED-V.6-03 sheet 3	00
				AGRS Kardzhali. Analyzing and measuring unit - P&ID	IGB-04-FEED-V.6-03 sheet 4	00
				AGRS Kardzhali. Regulating unit - P&ID	IGB-04-FEED-V.6-03 sheet 5	00
				AGRS Kardzhali. Station exit - P&ID	IGB-04-FEED-V.6-03 sheet 6	00
				AGRS Kardzhali. Gas heater A – P&ID	IGB-04-FEED-V.6-03 sheet 7	00
				AGRS Kardzhali. Gas heater B – P&ID	IGB-04-FEED-V.6-03 sheet 8	00
				AGRS Kardzhali. Closed drainage system – P&ID	IGB-04-FEED-V.6-03 sheet 9	00
				AGRS Kardzhali. Nitrogen installation– P&ID	IGB-04-FEED-V.6-03 sheet 10	00
				AGRS Kardzhali. Valve block BV3 – P&ID	IGB-04-FEED-V.6-03 sheet 11	00
				Block diagram of control and measurement systems- AGRS Kardzhali	IGB-04-FEED-V.6-04	00
				Connection diagram for measurement system - AGRS Kardzhali	IGB-04-FEED-V.6-05	00
				Block diagram of systems - AGRS Kardzhali	IGB-04-FEED-V.6-06	00
				Block diagram of telecommunication system- AGRS Kardzhali	IGB-04-FEED-V.6-07	00
				Symbols and legend. Standard valve actuators	IGB-04-FEED-V.6-08	00
				Connection diagrams for control and measurement - AGRS Kardzhali	IGB-04-FEED-V.6-09 sheet 1	00

Volume	Sub volume	Part	Section	Name	Drawing/Document number	Rev
				Connection diagrams for control and measurement - AGRS Kardzhali	IGB-04-FEED-V.6-09 sheet 2	00
				Connection diagrams for control and measurement - AGRS Kardzhali	IGB-04-FEED-V.6-09 sheet 3	00
				Connection diagrams for control and measurement - AGRS Kardzhali	IGB-04-FEED-V.6-09 sheet 4	00
				Connection diagrams for control and measurement - AGRS Kardzhali	IGB-04-FEED-V.6-09 sheet 5	00
				Connection diagrams for control and measurement - AGRS Kardzhali	IGB-04-FEED-V.6-09 sheet 6	00
				Connection diagrams for control and measurement - AGRS Kardzhali	IGB-04-FEED-V.6-09 sheet 7	00
				Assembly equipment. Details: Terminal switchboard and cable entries	IGB-04-FEED-V.6-10	00
				Assembly equipment. Details: Prop for single terminal switchboard	IGB-04-FEED-V.6-11	00
				Assembly equipment. Details: Prop for terminal switchboards	IGB-04-FEED-V.6-12	00
				Assembly equipment. Switchboard with 60 terminals. Not spark protected.	IGB-04-FEED-V.6-13	00
				Assembly equipment. Details: Switchboard with 60 terminals. Spark protected.	IGB-04-FEED-V.6-14	00
				Assembly equipment. Details: Switchboard with 120 terminals. Spark protected.	IGB-04-FEED-V.6-15	00
				Assembly equipment. Details: terminal distribution board for relay installation	IGB-04-FEED-V.6-16	00
				Assembly equipment. Details: standard detail for grounding of blast-proof circuits	IGB-04-FEED-V.6-17	00
				Assembly equipment. Details: standard detail for grounding of spark-proof circuits	IGB-04-FEED-V.6-18	00
				Assembly equipment. Details: standard detail for circuit marking	IGB-04-FEED-V.6-19	00
				Assembly equipment. Details: standard board for equipment	IGB-04-FEED-V.6-20	00
				Assembly equipment. Details: standard detail for mounting of cable tray	IGB-04-FEED-V.6-21	00
				Assembly equipment. Details: cable arrangement of boards	IGB-04-FEED-V.6-22	00
				Assembly equipment. Details: cable laying elements	IGB-04-FEED-V.6-23	00
				BILL OF QUANTITIES	IGB-04-FEED-V.6-BQ	00
		7		**FIRE SAFETY**	IGB-04-FEED-V.7	01
		8		**ELECTRICAL**	IGB-04-FEED-V.8	01
		9		**TECHNOLOGICAL CONNECTION SYSTEMS**	IGB-04-FEED-V.9	00
				Situation	IGB-04-FEED-V.9	00
				BILL OF QUANTITIES	IGB-04-FEED-V.9_BILQN	00
		10		**HVAC**	IGB-04-FEED-V.10	00
		11		**ENERGY EFFICIENCY**	IGB-04-FEED-V.11	00
		12		**SAFETY AND HEALTH PLAN**	IGB-04-FEED-V.12	00
		13		**WATER SUPPLY AND SEWERAGE**	IGB-04-FEED-V.13	01
VI				**SUBPROJECT: DISPACHING CENTER**		

Volume	Sub volume	Part	Section	Name	Drawing/Document number	Rev
		1		GEOLOGY SURVEY	IGB-04-FEED-VI.1	00
		2		GENERAL LAYOUT	IGB-04-FEED-VI.2	00
		3		TRACING PLAN AND VERTICAL PLANNING	IGB-04-FEED-VI.3	01
		4		ARCHITECTURAL	IGB-04-FEED-VI.4	00
		5		STRUCTURAL PART	IGB-04-FEED-VI.5	00
		6		GREENING	IGB-04-FEED-VI.6	01
		7		ELECTRICAL PART	IGB-04-FEED-VI.7	00
		8		TECHNOLOGICAL CONNECTION SYSTEMS	IGB-04-FEED-VI.8	01
				General layout	IGB-04-FEED-VI.8	00
				BILL OF QUANTITIES	IGB-04-FEED-VI.8- BILQN	00
		9		WATER SUPPLY AND SEWERAGE	IGB-04-FEED-VI.9	01
		10		HVAC	IGB-04-FEED-VI.10	00
		11		ENERGY EFFICIENCY	IGB-04-FEED-VI.11	00
		12		SAFETY AND HEALTH PLAN	IGB-04-FEED-VI.12	00
		13		FIRE SAFETY	IGB-04-FEED-VI.13	01
		14		АТП		da/ne
		14		FIRE FIGHTING BY GAS	IGB-04-FEED-VI.14	00
		15		AUTOMATION OF TECHNOLOGICAL PROCESSES	IGB-04-FEED-VI.15	00
				A structural diagram of IAPCS for the gas pipeline on the territory of the Republic of Bulgaria	IGB-04-FEED-VI.15-01	00
VII				TECHNOLOGICAL CONNECTION – ORGANIZATION OF THE CONNECTIONS. EQUIPMENT OF THE CONNECTION SYSTEMS	IGB-04-FEED-VII	
	1			ORGANIZATION OF THE CONNECTIONS	IGB-04-FEED-VII.1	00
				General scheme for organization of the connections	IGB-04-FEED-VII.1-Comm1	00
	2			A LOCAL AREA NETWORK (LAN). NETWORK INFRASTRUCTURE. EQUIPMENT	IGB-04-FEED-VII.2	01
				The logical topology of our network	IGB-04-FEED-VII.2-Comm1	00
				An office building – A video conferencing system	IGB-04-FEED-VII.2-Comm2	00
		1		VALVE BLOCKS	IGB-04-FEED-VII.2.1	01
				Valve block VB-2 - Layout in the telecommunication cabinet	IGB-04-FEED-VII.2.1-Comm1	00
				Valve block VB -3A - Layout in the telecommunication cabinet	IGB-04-FEED-VII.2.1-Comm2	00
				Valve block VB -4 - Layout in the telecommunication cabinet	IGB-04-FEED-VII.2.1-Comm3	00
				Valve block VB -4A - Layout in the telecommunication cabinet	IGB-04-FEED-VII.2.1-Comm4	00
				Valve block VB -5 - Layout in the telecommunication cabinet	IGB-04-FEED-VII.2.1-Comm5	00
				Valve block VB -6 - Layout in the telecommunication cabinet	IGB-04-FEED-VII.2.1-Comm6	00
				Valve block VB -7 - Layout in the telecommunication cabinet	IGB-04-FEED-VII.2.1-Comm7	00
		2		AGRS AND GMS	IGB-04-FEED-VII.2.2	00
				AGRS Kardzhali and VB-3 - Layout in the telecommunication cabinet	IGB-04-FEED-VII.2.2-Comm1	00
				AGRS Dimitrovgrad - Layout in the telecommunication cabinet	IGB-04-FEED-VII.2.2-Comm2	00
				GMS-2 Stara Zagora - Layout in the telecommunication cabinet	IGB-04-FEED-VII.2.2-Comm3	00
		3		DISPATCH CENTER	IGB-04-FEED-VII.2.3	00
		4		SERVER ROOM	IGB-04-FEED-VII.2.4	00

Volume	Sub volume	Part	Section	Name	Drawing/Document number	Rev
				Office building – Server room	IGB-04-FEED-VII.2.4-Comm1	00
				Server room - Layout in the telecommunication cabinet KY 2	IGB-04-FEED-VII.2.4-Comm2	00
				Server room - Layout in the telecommunication cabinet KY 3	IGB-04-FEED-VII.2.4-Comm3	00
				Server room - Layout in the telecommunication cabinet KY 4	IGB-04-FEED-VII.2.4-Comm4	00
				Server room - Layout in the telecommunication cabinet KY 5	IGB-04-FEED-VII.2.4-Comm5	00
				Server room - Layout in the telecommunication cabinet KY 6	IGB-04-FEED-VII.2.4-Comm6	00
				Server room - Layout in the telecommunication cabinet KY 7	IGB-04-FEED-VII.2.4-Comm7	00
				Server room - Layout in the telecommunication cabinet KY 8	IGB-04-FEED-VII.2.4-Comm8	00
				Server room - Layout in the telecommunication cabinet KY 9	IGB-04-FEED-VII.2.4-Comm9	00
				Server room - Layout in the telecommunication cabinet KY 10	IGB-04-FEED-VII.2.4-Comm10	00
		5		**TELEPHONE SYSTEM**	IGB-04-FEED-VII.2.5	00
				Standard building of a crane center – Arrangement of telephone sets	IGB-04-FEED-VII.2.5-Comm1_rev00	00
				Office building - Arrangement of telephone sets	IGB-04-FEED-VII.2.5-Comm2_rev00	00
				AGDS Kurdzhali and BVS-3 - Arrangement of telephone sets	IGB-04-FEED-VII.2.5-Comm3_rev00	00
				AGDS Dimitrovgrad - Arrangement of telephone sets	IGB-04-FEED-VII.2.5-Comm4_rev00	00
				GMS-2 Stara Zagora - Arrangement of telephone sets	IGB-04-FEED-VII.2.5-Comm5_rev00	00
	3			**ACTIVE SYSTEM FOR MONITORING OPTICAL FIBERS**	IGB-04-FEED-VII.3	00
				Scheme of organization of the system for monitoring of optical fibers	IGB-04-FEED-VII.3-Comm1	01
	4			**OPTICAL INFRASTRUCTURE. EXTERNAL CONNECTIONS WITH OTHER TELECOMMUNICATION OPERATORS**	IGB-04-FEED-VII.4	00
				Linear optical connectivity scheme and optical fiber usage	IGB-04-FEED-VII.4-Comm1	00
				Valve blocks – positioning of optical fiber cable and telecommunication rack.	IGB-04-FEED-VII.4-Comm2	00
				VB-3 and AGRS Kardjali - positioning of optical fiber cable and telecommunication rack.	IGB-04-FEED-VII.4-Comm3	00
				AGRS Dimitrovgrad- positioning of optical fiber cable and telecommunication rack.	IGB-04-FEED-VII.4-Comm4	00
				GMS-2 Stara Zagora -positioning of optical fiber cable and telecommunication rack.	IGB-04-FEED-VII.4-Comm5	00
				Office building – Server room - positioning of optical fiber cable	IGB-04-FEED-VII.4-Comm6	00
				AGRS Kardjali and VB-6 - Optical distribution fibers and couplers	IGB-04-FEED-VII.4-Comm	00
				VB-5 - Optical distribution fibers and coupler	IGB-04-FEED-VII.4-Comm8	00
				VB-3A and AGRS DImitrovgrad - Optical distribution fibers and couplers	IGB-04-FEED-VII.4-Comm9	00
				VB 4 and VB-4A - Optical distribution fibers and couplers	IGB-04-FEED-VII.4-Comm10	00
				VB - 2 and GMS - 2 - Optical distribution fibers and couplers	IGB-04-FEED-VII.4-Comm11	00

Volume	Sub volume	Part	Section	Name	Drawing/Document number	Rev
				VB-7 - Optical distribution fibers and couplers	IGB-04-FEED-VII.4-Comm12	00
				Office building – Server room - Optical distribution fibers	IGB-04-FEED-VII.4-Comm13	00
VIII				**EXTERNAL CONNECTIONS**		
	1			**EXTERNAL POWER SUPPLY NETWORKS**	IGB-04-FEED-VIII.1	
	2			**ACCESS ROADS**	IGB-04-FEED-VIII.2	
	3			**Sewage external connections**	**IGB-04-FEED-VIII.3**	
IX				**BILL OF QUANTITY DOCUMENTATION**		
X				**RISK ANALYSIS**		
XI				**PROJECT FOR ORGANIZATION OF THE CONSTRUCTION**		
XII				**PLAN FOR MANAGEMENT OF CONSTRUCTION WASTE**		

Legend:

Process Automation
Telecommunication

10.Appendix B – List of FEED Documentation for the Greek Section

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
1	**OVERALL - GENERAL**		
1.1	**GENERAL**		
1	List of Applicable Norms and Legislations	10760-LST-EN-00-001	0
2	Specification for Inspection and Testing Requirement for Material and Equipment	10760-SPC-EN-00-001	2
3	Specification for Commissioning and Start-up	10760-SPC-PL-00-001	0
4	Tag Numbering System Procedure	10760-PRC-PM-00-011	0
5	Nameplate for Vessels	10760/ME/00/10/009	1
1.2	**SAFETY REPORTS**		
1	HAZID Study Report	10760-RPT-SF-00-002	1
2	HAZOP Study Report	10760-RPT-SF-00-003	1
3	Quantitative Risk Assessment for the Greek Section	10760-RPT-SF-00-005	2
4	SIL Assessment Procedure Report	10760-RPT-SF-00-008	0
1.3	**PROCESS DESIGN**		
1.3.1	**Reports / Philosophies**		
1	Design Basis Memorandum	10760-PHL-EN-00-001	2
2	Gas Transmission System Operation, Inspection, Maintenance and Repair (OIMR) Philosophy	10760-PHL-EN-00-002	1
3	Overall Process Description	10760-PHL-PR-00-002	2
4	Blow down and Vertical Study – Gas Metering and Automated Gas Regulation Stations	10760-PHL-PR-M0-001	1
5	Process Equipment and Lines Design Philosophy (Sizing, Sparing, Isolation) – Gas Metering and Automated Gas Regulation Stations	10760-PHL-PR-M0-005	3
6	Blow down and Venting Study - Pipeline	10760-PHL-PR-P0-001	2
7	Preliminary Hydraulic Assessment	10760-RPT-PR-00-001	1
1.3.2	**Drawings**		
1.3.2.1	**Process / Utility Flow Diagrams**		
1	Process Flow Diagram – Pipeline Komotini to Greek – Bulgarian border	10760/PR/P0/01/001	4
2	Process Flow Diagram – Type 1	10760/PR/00/01/001	0
3	Process Flow Diagram – Komotini Gas Metering Station	10760/PR/A1/01/001	4
4	Utility Flow Diagram – Komotini GMS – Vent	10760/PR/A1/01/011	3
5	Utility Flow Diagram – Komotini GMS – Closed Drain System	10760/PR/A1/01/021	3
6	Utility Flow Diagram – Komotini GMS – Nitrogen System	10760/PR/A1/01/031	3
7	Utility Flow Diagram – Komotini Gas Metering Station Fuel Gas System	10760/PR/A1/01/041	3
8	Utility Flow Diagram – Komotini Gas Metering Station Hot Water System	10760/PR/A1/01/051	3
1.3.2.2	**Piping and Instrumentation Diagrams**		

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
Symbols & Legend Sheets			
1	Piping & Instrumentation Diagram – Symbols and Legend Sheet – Piping and Equipment	10760/PR/00/02/001	3
2	Piping & Instrumentation Diagram – Symbols and Legend Sheet – Instruments	10760/PR/00/02/002	3
3	Piping & Instrumentation Diagram – Symbols and Legend Sheet – Typical Actuated Valves 1 / 2	10760/PR/00/02/003	3
4	Piping & Instrumentation Diagram – Symbols and Legend Sheet – Typical Actuated Valves 2 / 2	10760/PR/00/02/004	3
BVS Nymfea			
1	Piping and Instrumentation Diagram – Block Valve Station 1	10760/PR/P0/02/003	3
Komotini Pigging Station			
1	Piping and Instrumentation Diagram – Komotini Pigging Station	10760/PR/P0/02/001	3
Komotini GMS			
1	Piping and Instrumentation Diagram – Komotini GMS – Inlet Header	10760/PR/A1/02/001	3
2	Piping and Instrumentation Diagram – Komotini GMS – Gas Filter Separator A	10760/PR/A1/02/002	3
3	Piping and Instrumentation Diagram – Komotini GMS – Gas Filter Separator B	10760/PR/A1/02/003	3
4	Piping and Instrumentation Diagram – Komotini GMS – Analyser and Metering Section	10760/PR/A1/02/004	3
5	Piping and Instrumentation Diagram – Komotini GMS – Regulating Section	10760/PR/A1/02/005	3
6	Piping and Instrumentation Diagram – Komotini GMS – Station Outlet	10760/PR/A1/02/006	3
7	Piping and Instrumentation Diagram – Komotini GMS – Gas Pre-Heater A	10760/PR/A1/02/007	3
8	Piping and Instrumentation Diagram – Komotini GMS – Gas Pre-Heater B	10760/PR/A1/02/008	3
9	Piping and Instrument Diagram – Utilities – Komotini GMS – Vent	10760/PR/A1/02/011	3
10	Piping and Instrument Diagram – Utilities – Komotini GMS – Closed Drain System	10760/PR/A1/02/021	3
11	Piping and Instrument Diagram – Utilities – Komotini GMS – Nitrogen System	10760/PR/A1/02/031	3
12	Piping and Instrument Diagram – Utilities – Komotini GMS – Fuel Gas System	10760/PR/A1/02/041	3
13	Piping and Instrument Diagram – Utilities – Komotini GMS – Hot Water System	10760/PR/A1/02/051	3
14	Piping and Instrument Diagram – Utilities – Komotini GMS – Water Storage for Hot Water System	10760/PR/A1/02/052	4
15	Piping and Instrumentation Diagram – Utilities – Komotini GMS – Station Control Building Fire Suppression System	10760/PR/A1/02/071	1

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
16	Piping and Instrument Diagram – Utilities – Komotini GMS – Emergency Diesel Generator	10760/PR/A1/02/081	1
1.3.3	**Lists**		
Pipeline / BVS / Pigging Station			
1	Equipment List – Pipeline (Pigging Stations & Block Valves)	10760-LST-PR-P0-001	2
2	Line List – Pipeline	10760-LST-PR-P0-002	2
3	Valve List – Pipeline	10760-LST-PR-P0-003	3
Komotini GMS			
1	Equipment List – Komotini GMS	10760-LST-PR-A1-001	3
2	Line List – Komotini GMS	10760-LST-PR-A1-002	2
3	Valve List – Komotini GMS	10760-LST-PR-A1-003	2
1.3.4	**Process Data Sheets**		
Pipeline / BVS / Pigging Station			
1	Process Data Sheet – Vent Stack – Block Valve Stations	10760-DAT-PR-P0-007	1
Komotini GMS1			
1	Process Data Sheet – Komotini Pig Trap V-P001	10760-DAT-PR-P0-001	2
2	Process Data Sheet - Komotini GMS - Filter Separator V-A101 A/B	10760-DAT-PR-A1-001	2
3	Process Data Sheet - Komotini GMS - Gas Metering Package Z-A101 A/B	10760-DAT-PR-A1-002	2
4	Process Data Sheet - Komotini GMS - Gas Heaters E-A101 A/B	10760-DAT-PR-A1-003	3
5	Process Data Sheet - Komotini GMS - Vent Stack	10760-DAT-PR-A1-011	1
6	Process Data Sheet - Komotini GMS - Closed Drain Drum	10760-DAT-PR-A1-021	1
7	Process Data Sheet - Komotini GMS - Closed Drain Drum Sump Pump	10760-DAT-PR-A1-022	1
8	Process Data Sheet - Komotini GMS - Nitrogen Package	10760-DAT-PR-A1-031	0
9	Process Data Sheet - Komotini GMS - Fuel Gas Package	10760-DAT-PR-A1-041	1
10	Process Data Sheet - Komotini GMS - Hot Water Package	10760-DAT-PR-A1-051	2
1.4	**CIVIL AND STRUCTURAL DESIGN**		
1.4.1	**Specifications**		
1	Job Specification for Civil Design Loads	10760-SPC-CI-00-401	0
2	Job Specification for Site Requirements	10760-SPC-CI-00-402	1
3	Job Specification for Trenching & Excavations	10760-SPC-CI-00-403	1
4	Job Specification for Backfilling	10760-SPC-CI-00-404	1
5	Job Specification for Concrete Works	10760-SPC-CI-00-405	0
6	Job Specification for Fabrication of Structural Steelwork	10760-SPC-CI-00-406	0
7	Job Specification for Erection and Testing of Structural Steelwork	10760-SPC-CI-00-407	0

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
8	Job Specification for Paving	10760-SPC-CI-00-408	0
9	Job Specification for Fencing	10760-SPC-CI-00-409	0
10	Job Specification for Fencing	10760-SPC-CI-00-410	0
11	Job Specification for Reinstatement	10760-SPC-CI-00-411	1
12	Job Specification for Stormwater Sewer System	10760-SPC-CI-00-412	1
13	Job Specification for Application of Erosion Protection Measures	10760-SPC-CI-00-413	1
14	Job Specification for Crossings	10760-SPC-CI-00-414	1
15	Job Specification for Muddy Bottom Replacement	10760-SPC-CI-00-415	1
1.4.2	**STD Drawings**		
1	Top Soil Erosion Protection for Pipeline Greek Section	10760/CI/P1/10/401	1
2	Erosion Protection Ditch Breakers with Sand Bags, Cement – Sand Bags or Natural Bentonite Greek Section	10760/CI/P1/10/402	1
3	Erosion Protection Ditch Breakers with Concrete Greek Section	10760/CI/P1/10/403	1
4	Watercourse or River Bank Protection with Gabions Greek Section	10760/CI/P1/10/404	2
5	River or Watercourse Bed Protection With Gabion Boxes Greek Section	10760/CI/P1/10/405	2
6	Typical R.O.W. Configuration and Typical Trenches for N.G. Pipeline Greek Section	10760/CI/P1/10/406 (13 Sheets)	3
7	Fibre Optic (F.O.) Cable conduit Installation Greek Section	10760/CI/P1/10/407 (7 Sheets)	2
8	Typical Pipeline Construction Details Ravine Crossing – Bed Erosion Protection with Rip-Rap Greek Section	10760/CI/P1/10/408	2
9	Pipeline Backfill Protection with Curb Greek Section	10760/CI/P1/10/409	1
10	Surface Drainage & Erosion Protection with Rockfill and Galvanized Wire Mesh Greek Section	10760/CI/P1/10/410	2
11	N.G. Pipeline Crossings with Underground Obstacles Greek Section	10760/CI/P1/10/411	1
12	Typical Trench for Buried Pipelines in Areas with Active Faults Crossings Greek Section	10760/CI/P1/10/412	2
13	Special Protection Measures for Buried Pipelines In Areas with Active Faults Crossings Greek Section	10760/CI/P1/10/413 Sheet 1 of 2	2
14	Special Protection Measures for Buried Pipelines In Areas with Active Faults Crossings	10760/CI/P1/10/413	2

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	Greek Section	Sheet 2 of 2	
15	Typical Trench of Pipeline at Horizontal Bend Nearby Seismic Fault – Plans and Sections Greek Section	10760/CI/P1/10/414	2
16	Geosynthetic Coating for Pipeline Protection in Active Fault Crossings and Sites with permanent Ground Deformation Greek Section	10760/CI/P1/10/415	1
17	Dewater Vacuum Drain for Pipeline Trench Greek Section	10760/CI/P1/10/416	1
18	Surface Drainage and Erosion Protection with Diversion Berms Greek Section	10760/CI/P1/10/417	1
19	Water Collector Pit Plan, Sections and Details Greek Section	10760/CI/P1/10/418	1
20	Typical Example of Station Access Road – Recording Plan Greek Section	10760/CI/P1/10/419	1
21	Typical Example of Station Access Road – Longitudinal Section Greek Section	10760/CI/P1/10/420	1
22	Typical Example of Station Access Road – Cross Sections Greek Section	10760/CI/P1/10/421	1
23	Typical Roads Standard Greek Section	10760/CI/P1/10/422	1
24	Fencing and Gates – Plan, Elevations, Sections and Details – Type 1 Anti intruder High Security Fencing Greek Section	10760/CI/P1/10/423 Sheet 1 of 3	1
25	Fencing and Gates – Plan, Elevations, Sections and Details – Station Double Main Entrance Gate (Type 1) Greek Section	10760/CI/P1/10/423 Sheet 2 of 3	1
26	Fencing and Gates – Plan, Elevations, Sections and Details – Type 2 General Fencing Greek Section	10760/CI/P1/10/423 Sheet 3 of 3	2
27	Concrete Paving Typical Details Greek Section	10760/CI/P1/10/424	1
28	Concrete Reinforcement STD Details Greek Section	10760/CI/P1/10/425	1
29	Concrete Pits for Pipeline Instruments (PI) and (PT) Greek Section	10760/CI/P1/10/426	2
30	Scraper Trap Foundation – Plan Sections and Details Greek Section	10760/CI/P1/10/427	1
31	Concrete Saddle Detail for Pipelines Greek Section	10760/CI/P1/10/428	1
32	Foundation of Bends 4”, 6” 8”, 10”, 12”, 14” for Vent Stack, Elevation and Details	10760/CI/P1/10/429	2

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	Greek Section		
33	Equal and Reducing Tee Foundation Greek Section	10760/CI/P1/10/430	1
34	Concrete Block for Pipeline Anchor Flanges Greek Section	10760/CI/P1/10/431	1
35	Concrete Pier for Kwh Meter and Transformer /Rectifier Cabinet for Pipelines Cathodic Protection Greek Section	10760/CI/P1/10/432 (7 Sheets)	1
36	F.O. Conduit Cable Manhole Greek Section	10760/CI/P1/10/433	1
37	Concrete Pit Tie-in (Φ1/4" Valves) Greek Section	10760/CI/P1/10/434	2
38	CP Marker / Measuring Post & Condensate Collector Post Footings Greek Section	10760/CI/P1/10/435 (4 Sheets)	2
39	Underground Pipe Culverts Greek Section	10760/CI/P1/10/436	1
40	CP. Measuring Pit in Paved Areas Greek Section	10760/CI/P1/10/437	1
41	Concrete Pit for Pig Signaler Greek Section	10760/CI/P1/10/438	2
42	Drainage Gutter Details Greek Section	10760/CI/P1/10/439	1
43	Underground Valves Foundation for Pipelines, Plan and Sections Greek Section	10760/CI/P1/10/440	1
44	Reinforced Concrete Coating for N.G. Pipeline Greek Section	10760/CI/P1/10/441 (4 Sheets)	1
45	Miscellaneous Civil Works Standard Details Greek Section	10760/CI/P1/10/442	1
46	Steel STD Details – Side Access Ladder Details Greek Section	10760/CI/P1/10/443 Sheet 1 of 4	1
47	Steel STD Details – Front Access Ladder Details Greek Section	10760/CI/P1/10/443 Sheet 2 of 4	1
48	Steel STD Details – Typical Steel Staircase Greek Section	10760/CI/P1/10/443 Sheet 3 of 4	1
49	Steel STD Details – Railing Greek Section	10760/CI/P1/10/443 Sheet 4 of 4	1
50	Safety Steel Barriers Greek Section	10760/CI/P1/10/444 (6 Sheets)	2
51	Pipeline Crossings with Major Public Road with Casing – Plan, Sections and Details Greek Section	10760/CI/P1/10/445	2
52	Pipeline Crossings with Future Road without Casing – Sections	10760/CI/P1/10/446	1

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	Greek Section		
53	Pipeline Crossings with Future Road with Steel Casing – Sections and Details Greek Section	10760/CI/P1/10/447	2
54	Pipeline Crossings with Railway – Plan, Sections and Details Greek Section	10760/CI/P1/10/448	2
55	Pipeline Crossings with Asphalt Public Road without Casing – Plan and Section Greek Section	10760/CI/P1/10/449	1
56	Pipeline Crossings with Unpaved Public Road without Casing – Plan and Section Greek Section	10760/CI/P1/10/450	1
57	Concrete Pit for Vent Orifice Greek Section	10760/CI/P1/10/451	0
1.5	**ARCHITECTURAL DESIGN**		
1.5.1	**Specifications**		
1	Job Specification for Brick Masonry Works	10760-SPC-CI-00-501	0
2	Job Specification for Raised Access Floors	10760-SPC-CI-00-505	0
3	Job Specification for Plastering	10760-SPC-CI-00-507	0
4	Job Specification for Ceramic Tiles	10760-SPC-CI-00-508	0
5	Job Specification for Steel Doors, Frames and Hardware – Minor Smithwork	10760-SPC-CI-00-509	0
6	Job Specification for Painting	10760-SPC-CI-00-512	0
7	Job Specification for Building Insulation – Waterproofing	10760-SPC-CI-00-513	0
8	Job Specification for Sealants	10760-SPC-CI-00-514	0
9	Job Specification for Sanitaries	10760-SPC-CI-00-515	0
1.6	**BULDING MECHANICAL DESIGN**		
1.6.1	**Specifications**		
1	Job Specification for Water Supply System	10760-SPC-ME-00-401	1
2	Job Specification for Sewer System	10760-SPC-ME-00-402	1
3	Job Specification for Fire Suppression Systems and Portable Fire Extinguishers	10760-SPC-ME-00-404	0
4	Job Specification for HVAC System	10760-SPC-ME-00-405	0
5	Job Specification for Testing of Piping Systems	10760-SPC-ME-00-406	0
1.7	**MECHANICAL / PIPING DESIGN**		
1.7.1	**Reports**		
1	Pipeline Material Selection Report	10760-RPT-EN-00-004	2
2	Linepipe Grade and Manufacture Selection Report	10760-RPT-PL-P0-005	1
1.7.2	**Specifications**		
1	Specification for Heat Shrink Sleeves and Coating Repair	10760-SPC-CP-P0-001	2
2	Specification for 3-Layer Polyethylene External Coating of Line Pipe	10760-SPC-CP-P0-002	4
3	Specification for Internal Lining of Line Pipe	10760-SPC-CP-P0-003	4

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
4	Specification for Painting and Temporary Protection of Equipment for non-buried applications, Factory and Field Applications	10760-SPC-CP-P0-004	1
5	Specification for the External Polyurethane Coating of Induction Bends, Valves and Other Pipe Specials	10760-SPC-CP-P0-005	2
6	Specification for Polyurethane Coating for the Pipe Weld Joint and Coating Repairs in the Field	10760-SPC-CP-P0-006	2
7	Specification for Vent Stacks	10760-SPC-ME-00-003	1
8	Specification for Filter – Separators	10760-SPC-ME-00-004	1
9	Specification for High Strength Flanges (based on EN 14870-3)	10760-SPC-ME-00-007	2
10	Specification For Fuel Gas Skid	10760-SPC-ME-00-009	3
11	Specification for Process Valves NPS ≥8”	10760-SPC-ME-00-010	3
12	Specification for Valves NPS <8»	10760-SPC-ME-00-011	2
13	Specification for Closed Drain Drums	10760-SPC-ME-00-012	1
14	Specification for Nitrogen Package	10760-SPC-ME-00-013	1
15	Specification for Hot Tap Split Tees	10760-SPC-ME-00-015	1
16	Specification for Mechanical and Piping Installation	10760-SPC-ME-00-101	1
17	Specification for Noise Control	10760-SPC-ME-00-103	1
18	Specification for Welding and Inspection Requirements for Piping (in accordance with EN 13480)	10760-SPC-ME-00-104	2
19	Specification for Piping Classes	10760-SPC-ME-00-105	1
20	Specification for Pig Traps	10760-SPC-ME-P0-001	1
21	Specification for Monolithic Insulating Joints	10760-SPC-ME-P0-002	1
22	Specification for Pipeline Ball Valves	10760-SPC-ME-P0-003	3
23	Specification for Barred Tees	10760-SPC-ME-P0-004	1
24	Specification for Casing Pipe	10760-SPC-PL-P0-001	2
25	Specification for Hot Induction Bends (based on EN 14870-1)	10760-SPC-PL-P0-002	2
26	Specification for Linepipe (based on EN 10208-2)	10760-SPC-PL-P0-003	5
27	Pipeline Construction Specification	10760-SPC-PL-P0-101	1
28	Specification for Gas Fired Water Bath Heaters Package	10760-SPC-ME-M0-001	1
29	Specification for Gas / Water Heat Exchangers	10760-SPC-ME-M0-002	1
30	Specification for Hot Water Boiler Package	10760-SPC-ME-M0-003	1
31	Specification for Pipeline Pressure Testing	10760-SPC-PL-P0-102	1
32	Specification for Welding and Inspection Requirements of Pipeline and Piping (in accordance with EN 1594)	10760-SPC-PL-P0-104	1
1.7.3	**Calculations**		
1	Wall Thickness Calculations: AGRS, GMS and Pipeline Stations	10760-CLC-ME-00-001	2
2	Pipeline Wall Thickness Calculations	10760-CLC-PL-P0-001	4
3	Pipeline Buoyancy Calculations	10760-CLC-PL-P0-002	1
4	Elastic Bending Calculations	10760-CLC-PL-P0-004	1

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5	Pipeline HDD Installation Calculations	10760-CLC-PL-P0-005	1
6	Pipeline Crossing Calculations – Greek Section	10760-CLC-PL-P1-003	2
1.7.4	**Data Sheets**		
1	Data Sheet for Casing Pipe	10760-DAT-PL-P0-001	1
2	Data Sheet for Induction Bends (Grade 450)	10760-DAT-PL-P0-002	3
3	Data Sheet for Linepipe Grade (L450)	10760-DAT-PL-P0-003	4
4	Data Sheet: Vent Stacks	10760-DAT-ME-00-003	1
5	Data Sheet: Ball Valves	10760-DAT-ME-00-010	2
6	Data Sheet: Plug Valves	10760-DAT-ME-00-011	1
7	Data Sheet: Check Valves	10760-DAT-ME-00-012	1
8	Data Sheet: Nitrogen Package	10760-DAT-ME-00-013	1
9	Data Sheet: Globe Valves	10760-DAT-ME-00-014	1
10	Data Sheet: Hot Tap Split Tees	10760-DAT-ME-00-015	1
11	Data Sheets for Pig Traps	10760-DAT-ME-P0-001	1
12	Data Sheet: Insulating Joints	10760-DAT-ME-P0-002	1
13	Data Sheets for Pipeline Ball Valves	10760-DAT-ME-P0-003	2
14	Data Sheet for Barred Tees	10760-DAT-ME-P0-004	1
15	Data Sheet for Pig Signallers	10760-DAT-ME-P0-005	1
16	Data Sheet: Gas Fired Water Bath Heaters	10760-DAT-ME-M0-001	1
17	Data Sheet: Closed Drain Drum – Komotini GMS	10760-DAT-ME-A1-002	1
20	Data Sheet: Hot Water Boiler Package – Komotini GMS	10760-DAT-ME-A1-003	1
21	Data Sheet: Filter Separator – Komotini GMS	10760-DAT-ME-A1-004	1
22	Data Sheet: Gas / Water Heat Exchangers - Komotini GMS	10760-DAT-ME-A1-005	1
23	Data Sheet: Fuel Gas Skid – Komotini GMS	10760-DAT-ME-A1-009	1
24	Data Sheet: Sump Pump – Komotini GMS	10760-DAT-ME-A1-016	1
1.7.5	**Material Requisitions**		
1	Material Requisition for Closed Drain Drums	10760-TRN-ME-00-002	1
2	Material Requisition for Vent Stacks	10760-TRN-ME-00-003	1
3	Material Requisition for Filter Separators	10760-TRN-ME-00-004	1
4	Material Requisition for Fuel Gas skid	10760-TRN-ME-00-009	1
5	Material Requisition for Valves NPS ≥8”	10760-TRN-ME-00-010	2
6	Material Requisition for Gas Fired Water Bath Heaters	10760-TRN-ME-M0-001	1
7	Material Requisition for Gas / Water Heat Exchangers	10760-TRN-ME-M0-002	1
8	Material Requisition for Hot Water Boiler Package	10760-TRN-ME-M0-003	1
9	Material Requisition for Pig Traps	10760-TRN-ME-P0-001	1
10	Material Requisition for Insulating joints	10760-TRN-ME-P0-002	1
11	Material Requisition for Pipeline Ball Valves	10760-TRN-ME-P0-003	2
12	Material Requisition for Barred Tees	10760-TRN-ME-P0-004	1
1.7.6	**SDRL’s**		

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
1	SDRL for Closed Drain Drums	10760-SDR-ME-00-002	1
2	SDRL for Vent Stacks	10760-SDR-ME-00-003	1
3	SDRL for Fuel Gas Skid	10760-SDR-ME-00-009	1
4	SDRL for Valves NPS >8»	10760-SDR-ME-00-010	1
5	SDRL for Gas Fired Water Bath Heaters	10760-SDR-ME-M0-001	1
6	SDRL for Gas / Water Heat Exchangers	10760-SDR-ME-M0-002	1
7	SDRL for Hot Water Boiler Package	10760-SDR-ME-M0-003	1
8	SDRL for Filter-Separators	10760-SDR-ME-M0-004	1
9	SDRL for Pig Traps	10760-SDR-ME-P0-001	1
10	SDRL for Insulating joints	10760-SDR-ME-P0-002	1
11	SDRL for Pipeline Ball Valves	10760-SDR-ME-P0-003	1
12	SDRL for Barred Tees	10760-SDR-ME-P0-004	1
13	SDRL for Casing Pipe	10760-SDR-PL-P0-001	1
14	SDRL for Hot Induction Bends	10760-SDR-PL-P0-002	1
15	SDRL for Linepipe	10760-SDR-PL-P0-003	1
1.7.7	**Technical Requisitions**		
1	Technical Requisition for Supply of Casing Pipe	10760-TRN-PL-P0-001	2
2	Technical Requisition for Supply of Hot Induction Bends	10760-TRN-PL-P0-002	3
3	Technical Requisition for Supply of Line Pipe	10760-TRN-PL-P0-003	4
1.8	**CATHODIC PROTECTION SYSTEM DESIGN**		
1.8.1	**Specifications**		
1	Job Specification for Electrical Resistance Welding “Pin Brazing”	10760-SPC-CP-00-401	0
2	Job Specification for Installation of Cathodic Protection System	10760-SPC-CP-00-402	1
3	Job Specification for Precautions Against Proximity Effects During the Construction Phase	10760-SPC-CP-00-403	0
4	Job Specification for Installation of Local Cathodic Protection System in Gas Metering Stations (GMS) & Automated Gas Regulating Stations (AGRS)	10760-SPC-CP-00-404	0
1.8.2	**STD Drawings**		
1	Cathodic Protection System Typical details (Greek Section)	10760/CP/P0/10/401_GR	1
1.8.3	**Material Requisitions**		
1	Material Requisition for Cathodic Protection Transformer / Rectifier Cabinet	10760-TRN-CP-P0-401	1
2	Material Requisition for Cathodic Protection Anode Material	10760-TRN-CP-P0-402	1
3	Material Requisition for Cathodic Protection, Polarization Probe, Reference Electrode and ER Coupon	10760-TRN-CP-P0-403	1
4	Material Requisition for Marker and Measuring Posts	10760-TRN-CP-P0-404	0
5	Material Requisition for Cathodic Protection Cables	10760-TRN-CP-P0-405	0
6	Material Requisition for Isolating Spark Gaps	10760-TRN-CP-P0-406	1

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1.8.4	**Reports**		
1	Cathodic Protection System Design Report	10760-RPT-CP-00-401	0
2	External Corrosion Study	10760-RPT-CP-P0-001	1
1.8.5	**Lists**		
1	List of Measuring Posts in Greek Territory	10760-LST-CP-P1-401	1
1.8.6	**MTO's**		
1	Pipeline Cathodic Protection System MTO List in Greek Territory	10760-LST-CP-P1-402	0
2	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Cathodic Protection System MTO List	10760-LST-CP-A1-401	0
1.8.7	**Drawings**		
1	Cathodic Protection Configuration Diagram (Greek Territory)	10760/CP/P0/01/401_GR	3
2	Key Plan for Cathodic Protection Equipment (scale 1:50.000) in Greek Territory	10760/CP/P1/02/401	0
3	Installation Plan of CP Station and Anode Bed in at Pandrosos Area (Greek Territory)	10760/CP/P1/02/411	0
4	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Installation Plan of Cathodic Protection System	10760/CP/A1/02/401	0
1.9	**ELECTRICAL DESIGN**		
1.9.1	**Specifications**		
1	Specification for Lighting and Small Power Supply System	10760-SPC-EL-00-401	0
2	Specification for DC Power Supply System and Batteries	10760-SPC-EL-00-402	0
3	Specification for Cables and Cable Routing	10760-SPC-EL-00-403	0
4	General Requirements for the Procurement of Electrical Equipment and Materials	10760-SPC-EL-00-404	0
5	Specification for Electrical Installations	10760-SPC-EL-00-405	0
6	Specification for Earthing and Lightning Protection System	10760-SPC-EL-00-406	1
1.9.2	**STD Details**		
1	Electrical STD Details (Greek Section)	10760/EL/00/10/401_GR	0
1.10	**CONTROL AND INSTRUMENTATION DESIGN**		
1.10.1	**Reports**		
1	Integrated Control and Safety (ICS) System Design Report	10760-RPT-IN-00-006	3
2	SCADA System Integration Report	10760-RPT-IN-ST-001	2
3	Telecommunications System Report	10760-RPT-IN-ST-002	3
1.10.2	**Specifications**		
1	Specification for Control Valves	10760-SPC-IN-00-001	1
2	Specification for Field Instrumentation	10760-SPC-IN-00-002	1
3	Specification for Fire and Gas Detection Systems	10760-SPC-IN-00-003	3
4	Specification for Gas Analyzers	10760-SPC-IN-00-004	2

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5	Specification for General Instrumentation	10760-SPC-IN-00-005	1
6	Specification for ICS System Interface	10760-SPC-IN-00-007	2
7	Specification for ICS System Requirements	10760-SPC-IN-00-008	1
8	Specification for Instrument Installation	10760-SPC-IN-00-009	2
9	Specification for Security Systems	10760-SPC-IN-00-010	2
10	Specification for Leak Detection System	10760-SPC-IN-00-011	1
11	Specification for Testing, Calibration & Alignment of instrumentation	10760-SPC-IN-00-012	2
12	Specification for Valve Actuators	10760-SPC-IN-00-013	2
13	Specification For Pressure Relief Valves	10760-SPC-IN-00-014	2
14	Specification for Slam Shut Valves	10760-SPC-IN-00-015	1
15	Specification for Metering Station Control and Protection System	10760-SPC-IN-M0-001	1
16	Specification for Metering Systems	10760-SPC-IN-M0-002	2
17	Specification for Closed Circuit Television System	10760-SPC-IN-ST-001	3
18	Specification for Fibre Optic Cable	10760-SPC-IN-ST-002	2
19	Specification for Installation of Fibre Optic Cable	10760-SPC-IN-ST-003	3
20	Specification for Control Panels	10760-SPC-IN-ST-004	1
21	Specification for SCADA Systems	10760-SPC-IN-ST-005	2
22	Specification for Telecommunications Electrical / Grounding	10760-SPC-IN-ST-006	2
23	Specification for Telecommunications System	10760-SPC-IN-ST-007	4
24	Specification for Telecommunications System Installation	10760-SPC-IN-ST-008	3
25	Specification for Telecommunications System Interface	10760-SPC-IN-ST-009	2
1.10.3	**Instrument Installation Details**		
1	Instrument Installation Details Cover Index	10760/IN/00/10/001-01	2
2	Instrument Installation Details Junction Box Cable Entry	10760/IN/00/10/001-02	2
3	Instrument Installation Details Single Junction Box Support	10760/IN/00/10/001-03	2
4	Instrument Installation Details Multi Junction Box Support Frame	10760/IN/00/10/001-04	2
5	Instrument Installation Details 60 Terminal Junction Box Intrinsically Safe	10760/IN/00/10/001-05	2
6	Instrument Installation Details – 60 Terminal Junction Box Non-Intrinsically Safe Circuits	10760/IN/00/10/001-06	2
7	Instrument Installation Details – 120 Terminal Junction Box Intrinsically Safe Circuits	10760/IN/00/10/001-07	2
8	Instrument Installation Details – Interposing Relay Panel	10760/IN/00/10/001-08	2
9	Instrument Installation Details – Typical Earthing Details Flameproof Circuits	10760/IN/00/10/001-09	2
10	Instrument Installation Details – Typical Earthing Details Intrinsically Safe Circuits	10760/IN/00/10/001-10	2

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11	Instrument Installation Details – Typical Marshalling Details	10760/IN/00/10/001-11	2
12	Instrument Installation Details – Typical Loop Tagging	10760/IN/00/10/001-12	2
13	Instrument Installation Details – Cable Tray Support	10760/IN/00/10/001-13	2
14	Instrument Installation Details – Cable Tray Support	10760/IN/00/10/001-14	2
15	Instrument Installation Details – Cable Arrangement Under Access Floor	10760/IN/00/10/001-15	2
16	Instrument Installation Details – Cable Trench Cross Section	10760/IN/00/10/001-16	2
17	Instrument Installation Details – Cable Trench Cross Section	10760/IN/00/10/001-17	2
18	Instrument Installation Details – Support and Housing	10760/IN/00/10/001-18	2
19	Instrument Installation Details – Instrument Cable Support	10760/IN/00/10/001-19	2
20	Instrument Installation Details – Flammable Gas Detector Mounting	10760/IN/00/10/001-20	2
21	Instrument Installation Details – Heat Detector Mounting	10760/IN/00/10/001-21	2
22	Instrument Installation Details – Infra-Red Flame Detector Mounting	10760/IN/00/10/001-22	2
23	Instrument Installation Details – Manual Call Point (Indoor Mounted)	10760/IN/00/10/001-23	2
24	Instrument Installation Details – Manual Call Point (outdoor Mounted)	10760/IN/00/10/001-24	2
25	Instrument Installation Details – Optical Smoke Detector	10760/IN/00/10/001-25	2
26	Instrument Installation Details – Sounder & Beacon	10760/IN/00/10/001-26	2
1.10.4	**Data Sheets**		
	Pipeline / BVS / SS		
1	Data Sheet: Non-Intrusive, Buried Pig Signallers	10760-DAT-IN-P0-002	1
2	Data Sheet: Pressure Relief Valves - Pipeline	10760-DAT-IN-P0-001	1
	Komotini Gas Metering Station		
1	Data Sheet: Control Valves – Komotini Gas Metering Station	10760-DAT-IN-A1-001	3
2	Data Sheet: Differential Pressure Transmitters – Komotini Gas Metering Station	10760-DAT-IN-A1-002	1
3	Data Sheet: Gas Analyzers – Komotini Gas Metering Station	10760-DAT-IN-A1-003	1
4	Data Sheet: Level gauges – Komotini Gas Metering Station	10760-DAT-IN-A1-004	1
5	Data Sheet: Level transmitters – Komotini Gas Metering Station	10760-DAT-IN-A1-005	1
6	Data Sheet: Motor Operated Actuators – Komotini Gas Metering Station	10760-DAT-IN-A1-006	3
7	Data Sheet: On/Off Actuators for Actuated Valves – Komotini Gas Metering Station	10760-DAT-IN-A1-007	4

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8	Data Sheet: Pressure gauges – Komotini Gas Metering Station	10760-DAT-IN-A1-008	2
9	Data Sheet: Pressure transmitters – Komotini Gas Metering Station	10760-DAT-IN-A1-009	2
10	Data Sheet: Safety Relief Valve – Komotini Gas Metering Station	10760-DAT-IN-A1-010	3
11	Data Sheet: Temperature transmitters – Komotini Gas Metering Station	10760-DAT-IN-A1-011	1
12	Differential pressure gauges – Komotini Gas Metering Station	10760-DAT-IN-A1-012	1
13	Data Sheet: Metering System – Komotini Gas Metering Station	10760-DAT-IN-A1-013	1
1.10.5	**Material Requisitions**		
1	Material Requisition for HDPE Conduit	10760-TRN-IN-00-001	1
2	Material Requisition for Cables and Cable Glands	10760-TRN-IN-00-002	3
3	Material Requisition for Field Instrumentation	10760-TRN-IN-00-004	3
4	Material Requisition for Fire and Gas Detection System	10760-TRN-IN-00-005	5
5	Material Requisition for General Instrumentation	10760-TRN-IN-00-006	2
6	Material Requisition for Security Systems	10760-TRN-IN-00-007	5
7	Material Requisition for Valve Actuators	10760-TRN-IN-00-010	2
8	Material Requisition for Metering Systems	10760-TRN-IN-M0-001	1
9	Material Requisition for Closed Circuit Television System	10760-TRN-IN-ST-001	5
10	Material Requisition for Fibre Optic Cable	10760-TRN-IN-ST-002	1
11	Material Requisition for Station Control Panels	10760-TRN-IN-ST-004	4
1.10.6	**SDRL's**		
1	SDRL for HDPE Conduit	10760-SDR-IN-00-001	1
2	SDRL for Fibre Optic Cable	10760-SDR-IN-ST-001	1
1.10.7	**Lists**		
1	I/O List: Typical Pigging Station	10760-LST-IN-A0-001	3
2	I/O List: Typical Block Valve Station	10760-LST-IN-B0-001	3
3	I/O List: Typical Gas Metering Station	10760-LST-IN-M0-001	3
1.10.8	**Drawings**		
Overall			
1	Overall ICS System Schematic	10760/IN/00/01/001	5
2	Overall ICS System Block Diagram	10760/IN/00/02/001	2
3	Overall SCADA Control System Schematic	10760/IN/ST/01/001	2
4	Overall Telecommunications System Schematic	10760/IN/ST/01/002	2
5	Overall Telecommunications System Block Diagram	10760/IN/ST/02/001	2
BVS / PIGGING STATION			
1	Typical Pigging Station Cabling Block Diagram	10760/IN/A0/02/001	2
2	Typical Block Valve / Scraper Station Control System Schematic	10760/IN/B0/01/001	2

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3	Typical Block Valve Station Security and Access Control System Schematic	10760/IN/B0/01/004	2
4	Typical Block Valve Station Cabling Block Diagram	10760/IN/B0/02/001	4
5	Typical Block Valve Station Instrument and Security Equipment Layout and Cable Routing Diagram Sheet 1 of 9	10760/IN/B0/03/001-01	1
6	Typical Block Valve Station Instrument and Security Equipment Layout and Cable Routing Diagram Sheet 2 of 9	10760/IN/B0/03/001-02	1
7	Typical Block Valve Station Instrument and Security Equipment Layout and Cable Routing Diagram - Sheet 3 of 9	10760/IN/B0/03/001-03	1
8	Typical Block Valve Station Instrument and Security Equipment Layout and Cable Routing Diagram heet 4 of 9	10760/IN/B0/03/001-04	1
9	Typical Block Valve Station Instrument and Security Equipment Layout and Cable Routing Diagram - Sheet 5 of 9	10760/IN/B0/03/001-05	1
10	Typical Block Valve Station Instrument and Security Equipment Layout and Cable Routing Diagram - Sheet 6 of 9	10760/IN/B0/03/001-06	1
11	Typical Block Valve Station Instrument and Security Equipment Layout and Cable Routing Diagram - Sheet 7 of 9	10760/IN/B0/03/001-07	1
12	Typical Block Valve Station Instrument and Security Equipment Layout and Cable Routing Diagram - Sheet 8 of 9	10760/IN/B0/03/001-08	1
13	Typical Block Valve Station Instrument and Security Equipment Layout and Cable Routing Diagram - Sheet 9 of 9	10760/IN/B0/03/001-09	1
14	Typical Block Valve / Scraper Station RCC Building Equipment Layout	10760/IN/B0/04/001	3
Komotini GMS			
1	Typical Metering Station Control System Schematic	10760/IN/M0/01/001	3
2	Typical Metering Station Security and Access Control System Schematic	10760/IN/M0/01/003	2
3	Typical Metering Station ICS System Block Diagram	10760/IN/M0/02/001	2
4	Typical Metering Station Telecommunications System Block Diagram	10760/IN/M0/02/003	2
5	Typical Metering Station Cabling Block Diagram (7 sheets)	10760/IN/M0/02/005	2
6	Typical Metering Station Instrument, F&G and Security System Layout and Cable Routing Diagram - Sheet 1 of 2	10760/IN/M0/03/001-01	1
7	Typical Metering Station Instrument, F&G and Security System Layout and Cable Routing Diagram - Sheet 2 of 2	10760/IN/M0/03/001-02	1
8	Typical Metering Station Control Room Layout (2 Sheets)	10760/IN/M0/04/001	4

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9	Cause & Effect Diagram - Komotini Metering Station	10760/IN/A1/05/001	1
2	**PIPELINE**		
2.1	**ROUTING**		
2.1.1	**Reports**		
1	Route Selection Criteria in Greek Territory	10760-RPT-PR-P1-401	0
2	Stations Site Selection Criteria in Greek Territory	10760-RPT-PR-P1-402	0
2.1.2	**Lists**		
1	Class Location List	10760-LST-PL-P1-401	2
2	List of Intersection Points (Ki)	10760-LST-PL-P1-402	2
3	List of stations	10760-LST-PL-P1-403	2
4	Table of Existing and Future Crossings -	10760-TBN-PL-P1-401	2
5	Table with Longitudinal and Lateral Slopes Classification	10760-TBN-PL-P1-402	2
2.1.3	**Pipeline Routing Map – Recording Plan (scale 1:50.000)**		
1	Recommended Pipeline Routing Map – Recording Plan / Greek Section - Map HMGS 1:50.000 – Komotini & Mytikas	10760/PL/P1/02/402 Sheet 1 of 3	4
2.1.4	**Pipeline Routing Maps – Recording Plans (scale 1:5.000)**		
1	Key Plan for Correlation of Recording Plans sc. 1:5.000 - Greek Section	10760/PL/P1/01/420	2
2	Pipeline Routing Map / Recording Plan Greek Section From K0+000.00 To K5C+084.78	10760/PL/P1/02/421 Sheet 1 of 2	2
3	Pipeline Routing Map / Recording Plan Greek Section From K10+160.64 To K10+196.31	10760/PL/P1/02/42 Sheet 1 of 2	2
4	Pipeline Routing Map / Recording Plan Greek Section From K5C+084.78 To K10+160.64	10760/PL/P1/02/423 Sheet 1 of 2	2
5	Pipeline Routing Map / Recording Plan Greek Section From K10+196.31 To K13+019.24	10760/PL/P1/02/424 Sheet 1 of 2	2
6	Pipeline Routing Map / Recording Plan Greek Section From K13+019.24 To K17+453.07	10760/PL/P1/02/425 Sheet 1 of 2	2
7	Pipeline Routing Map / Recording Plan Greek Section From K17+453.07 To K23+240.37	10760/PL/P1/02/426 Sheet 1 of 2	2
8	Pipeline Routing Map / Recording Plan Greek Section From K23+240.37 To K40+066.08	10760/PL/P1/02/427 Sheet 1 of 2	2
9	Pipeline Routing Map / Recording Plan Greek Section From K40+066.08 To K55+084.56	10760/PL/P1/02/428 Sheet 1 of 2	2

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10	Pipeline Routing Map / Recording Plan Greek Section From K55+084.56 To K74+018.35	10760/PL/P1/02/429 Sheet 1 of 2	2
11	Pipeline Routing Map / Recording Plan Greek Section From K74+018.35 To K85+056.53	10760/PL/P1/02/430 Sheet 1 of 2	2
12	Pipeline Routing Map / Recording Plan Greek Section From K85+056.53 To K105+003.25	10760/PL/P1/02/431 Sheet 1 of 2	2
13	Pipeline Routing Map / Recording Plan Greek Section From K105+003.25 To K109+000.00	10760/PL/P1/02/432 Sheet 1 of 2	2
2.2	**TOPOGRAPHICAL / CADASTRAL**		
2.2.1	**Triangulation Network (scale 1:50.000)**		
1	Triangulation Network Diagram - Greek Section	10760/PL/P1/02/402 Sheet 2 of 3	1
2	Triangulation Report in Greek Territory	10760-RPT-PL-P1-401	1
2.2.2	**Leveling Network (scale 1:50.000)**		
1	Leveling Network Diagram - Greek Section	10760/PL/P1/02/402 Sheet 3 of 3	1
2	Leveling Report in Greek Territory	10760-RPT-PL-P1-402	1
2.2.3	**Polygonometry Network (scale 1:5.000)**		
1	Polygonometry Network Diagram - Greek Section From K0+000.00 To K5C+084.78	10760/PL/P1/02/421 Sheet 2 of 2	1
2	Polygonometry Network Diagram - Greek Section From K10+160.64 To K10+196.31	10760/PL/P1/02/42 Sheet 2 of 2	1
3	Polygonometry Network Diagram - Greek Section From K5C+084.78 To K10+160.64	10760/PL/P1/02/423 Sheet 2 of 2	1
4	Polygonometry Network Diagram - Greek Section From K10+196.31 To K13+019.24	10760/PL/P1/02/424 Sheet 2of 2	1
5	Polygonometry Network Diagram - Greek Section From K13+019.24 To K17+453.07	10760/PL/P1/02/425 Sheet 2 of 2	1
6	Polygonometry Network Diagram - Greek Section From K17+453.07 To K23+240.37	10760/PL/P1/02/426 Sheet 2 of 2	1
7	Polygonometry Network Diagram - Greek Section From K23+240.37 To K40+066.08	10760/PL/P1/02/427 Sheet 2 of 2	1
8	Polygonometry Network Diagram - Greek Section From K40+066.08 To K55+084.56	10760/PL/P1/02/428 Sheet 2 of 2	1
9	Polygonometry Network Diagram - Greek Section From K55+084.56 To K74+018.35	10760/PL/P1/02/429 Sheet 2 of 2	1
10	Polygonometry Network Diagram - Greek Section From K74+018.35 To K85+056.53	10760/PL/P1/02/430 Sheet 2 of 2	1
11	Polygonometry Network Diagram - Greek Section From K85+056.53 To K105+003.25	10760/PL/P1/02/431 Sheet 2 of 2	1
12	Polygonometry Network Diagram - Greek Section	10760/PL/P1/02/432	1

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	From K105+003.25 To K109+000.00	Sheet 2 of 2	
13	Polygonometric Network in Greek Territory	10760-RPT-PL-P1-403	1
2.2.4	**Survey Reports**		
1	Detailed Survey Technical Report in Greek Territory	10760-RPT-PL-P1-405	0
2.2.5	**Detailed Topographic Drawings – Recording Plans (scale 1:1.000) – Longitudinal Sections (scale 1:1.000 / 1:100)**		
1	Recording Plan – Greek Section From K0+000.00 To K1A+240.95	10760/PL/P1/02/601 Sheet 1 of 3	0
2	Longitudinal Section - Greek Section From K0+000.00 To K1A+240.95	10760/PL/P1/02/601 Sheet 2 of 3	0
3	Recording Plan – Greek Section From K1A+240.95 To K3+105.04	10760/PL/P1/02/602 Sheet 1 of 3	0
4	Longitudinal Section - Greek Section From K1A+240.95 To K3+105.04	10760/PL/P1/02/602 Sheet 2 of 3	0
5	Recording Plan – Greek Section From K3+105.04 To K4+187.65	10760/PL/P1/02/603 Sheet 1 of 3	1
6	Longitudinal Section - Greek Section From K3+105.04 To K4+187.65	10760/PL/P1/02/603 Sheet 2 of 3	1
7	Recording Plan – Greek Section From K4+187.65 To K5D+480.31	10760/PL/P1/02/604 Sheet 1 of 3	1
8	Longitudinal Section - Greek Section From K4+187.65 To K5D+480.31	10760/PL/P1/02/604 Sheet 2 of 3	1
9	Recording Plan – Greek Section From K5D+480.31 To K7+401.69	10760/PL/P1/02/605 Sheet 1 of 3	1
10	Longitudinal Section - Greek Section From K5D+480.31 To K7+401.69	10760/PL/P1/02/605 Sheet 2 of 3	1
11	Recording Plan – Greek Section From K7+401.69 To K12+187.72	10760/PL/P1/02/606 Sheet 1 of 3	0
12	Longitudinal Section - Greek Section From K7+401.69 To K12+187.72	10760/PL/P1/02/606 Sheet 2 of 3	0
13	Recording Plan – Greek Section From K12+187.72 to K14+197.17	10760/PL/P1/02/607 Sheet 1 of 3	0
14	Longitudinal Section - Greek Section From K12+187.72 To K14+197.17	10760/PL/P1/02/607 Sheet 2 of 3	0
15	Recording Plan – Greek Section From K14+197.17 To K16+028.62	10760/PL/P1/02/608 Sheet 1 of 3	0
16	Longitudinal Section - Greek Section From K14+197.17 To K16+028.62	10760/PL/P1/02/608 Sheet 2 of 3	0
17	Recording Plan – Greek Section From K16+028.62 To K18+243.86	10760/PL/P1/02/609 Sheet 1 of 3	0
18	Longitudinal Section - Greek Section From K16+028.62 To K18+243.86	10760/PL/P1/02/609 Sheet 2 of 3	0
19	Recording Plan – Greek Section From K18+243.86 To K19+1138.22	10760/PL/P1/02/610 Sheet 1 of 3	0

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
20	Longitudinal Section - Greek Section From K18+243.86 To K19+1138.22	10760/PL/P1/02/610 Sheet 2 of 3	0
21	Recording Plan – Greek Section From K19+1138.22 To K24+052.37	10760/PL/P1/02/611 Sheet 1 of 3	0
22	Longitudinal Section - Greek Section From K19+1138.22 To K24+052.37	10760/PL/P1/02/611 Sheet 2 of 3	0
23	Recording Plan – Greek Section From K24+052.37 To K29+080.99	10760/PL/P1/02/612 Sheet 1 of 3	0
24	Longitudinal Section - Greek Section From K24+052.37 To K29+080.99	10760/PL/P1/02/612 Sheet 2 of 3	0
25	Recording Plan – Greek Section From K29+080.99 To K32+070.13	10760/PL/P1/02/613 Sheet 1 of 3	0
26	Longitudinal Section - Greek Section From K29+080.99 ToK32+070.13	10760/PL/P1/02/613 Sheet 2 of 3	0
27	Recording Plan – Greek Section From K32+070.13 To K32A+609.68	10760/PL/P1/02/614 Sheet 1 of 3	0
28	Longitudinal Section - Greek Section From K32+070.13 To K32A+609.68	10760/PL/P1/02/614 Sheet 2 of 3	0
29	Recording Plan – Greek Section From K32A+609.68 To K33+158.72	10760/PL/P1/02/615 Sheet 1 of 3	0
30	Longitudinal Section - Greek Section From K32A+609.68 To K33+158.72	10760/PL/P1/02/615 Sheet 2 of 3	0
31	Recording Plan – Greek Section From K33+158.72 To K36+064.32	10760/PL/P1/02/616 Sheet 1 of 3	0
32	Longitudinal Section - Greek Section From K33+158.72 To K36+064.32	10760/PL/P1/02/616 Sheet 2 of 3	0
33	Recording Plan – Greek Section From K36+064.32 To K41+079.32	10760/PL/P1/02/617 Sheet 1 of 3	0
34	Longitudinal Section - Greek Section From K36+064.32 To K41+079.32	10760/PL/P1/02/617 Sheet 2 of 3	0
35	Recording Plan – Greek Section From K41+079.32 To K44+101.79	10760/PL/P1/02/618 Sheet 1 of 3	0
36	Longitudinal Section - Greek Section From K41+079.32 To K44+101.79	10760/PL/P1/02/618 Sheet 2 of 3	0
37	Recording Plan – Greek Section From K44+101.79 To K50+083.28	10760/PL/P1/02/619 Sheet 1 of 3	0
38	Longitudinal Section - Greek Section From K44+101.79 To K50+083.28	10760/PL/P1/02/619 Sheet 2 of 3	0
39	Recording Plan – Greek Section FromK50+083.28 To K53+024.60	10760/PL/P1/02/620 Sheet 1 of 3	0
40	Longitudinal Section - Greek Section From K50+083.28 To K53+024.60	10760/PL/P1/02/620 Sheet 2 of 3	0
41	Recording Plan – Greek Section From K53+024.60 To K57+257.22	10760/PL/P1/02/621 Sheet 1 of 3	0
42	Longitudinal Section - Greek Section	10760/PL/P1/02/621	0

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	From K53+024.60 To K57+257.22	Sheet 2 of 3	
	Recording Plan – Greek Section	10760/PL/P1/02/622	
43	From K57+257.22 To K61+027.92	Sheet 1 of 3	0
	Longitudinal Section - Greek Section	10760/PL/P1/02/622	
44	From K57+257.22 To K61+027.92	Sheet 2 of 3	0
	Recording Plan – Greek Section	10760/PL/P1/02/623	
45	From K61+027.92 To K62+184.39	Sheet 1 of 3	0
	Longitudinal Section - Greek Section	10760/PL/P1/02/623	
46	From K61+027.92 To K62+184.39	Sheet 2 of 3	0
	Recording Plan – Greek Section	10760/PL/P1/02/624	
47	From K62+184.39 To K65+041.26	Sheet 1 of 3	0
	Longitudinal Section - Greek Section	10760/PL/P1/02/624	
48	From K62+184.39 To K65+041.26	Sheet 2 of 3	0
	Recording Plan – Greek Section	10760/PL/P1/02/625	
49	From K65+041.26 To K69+174.62	Sheet 1 of 3	0
	Longitudinal Section - Greek Section	10760/PL/P1/02/625	
50	From K65+041.26 To K69+174.62	Sheet 2 of 3	0
	Recording Plan – Greek Section	10760/PL/P1/02/626	
51	From K69+174.62 To K72+107.72	Sheet 1 of 3	0
	Longitudinal Section - Greek Section	10760/PL/P1/02/626	
52	From K69+174.62 To K72+107.72	Sheet 2 of 3	0
	Recording Plan – Greek Section	10760/PL/P1/02/627	
53	From K72+107.72 To K74+078.03	Sheet 1 of 3	0
	Longitudinal Section - Greek Section	10760/PL/P1/02/627	
54	From K72+107.72 To K74+078.03	Sheet 2 of 3	0
	Recording Plan – Greek Section	10760/PL/P1/02/628	
55	From K74+078.03 To K76+776.31	Sheet 1 of 3	0
	Longitudinal Section - Greek Section	10760/PL/P1/02/628	
56	From K74+078.03 To K76+776.31	Sheet 2 of 3	0
	Recording Plan – Greek Section	10760/PL/P1/02/629	
57	From K76+776.31 To K81+028.07	Sheet 1 of 3	0
	Longitudinal Section - Greek Section	10760/PL/P1/02/629	
58	From K76+776.31 To K81+028.07	Sheet 2 of 3	0
	Recording Plan – Greek Section	10760/PL/P1/02/630	
59	From K81+028.07 To K90+061.86	Sheet 1 of 3	0
	Longitudinal Section - Greek Section	10760/PL/P1/02/630	
60	From K81+028.07 To K90+061.86	Sheet 2 of 3	0
	Recording Plan – Greek Section	10760/PL/P1/02/631	
61	From K90+061.86 To K96+124.44	Sheet 1 of 3	0
	Longitudinal Section - Greek Section	10760/PL/P1/02/631	
62	From K90+061.86 To K96+124.44	Sheet 2 of 3	0
	Recording Plan – Greek Section	10760/PL/P1/02/632	
63	From K96+124.44 To K100+387.16	Sheet 1 of 3	0
	Longitudinal Section - Greek Section	10760/PL/P1/02/632	
64	From K96+124.44 To K100+387.16	Sheet 2 of 3	0

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
65	Recording Plan – Greek Section From K100+387.16 To K105+036.83	10760/PL/P1/02/633 Sheet 1 of 3	0
66	Longitudinal Section - Greek Section From K100+387.16 To K105+036.83	10760/PL/P1/02/633 Sheet 2 of 3	0
67	Recording Plan – Greek Section From K105+036.83 To K109+000.00	10760/PL/P1/02/634 Sheet 1 of 3	0
68	Longitudinal Section - Greek Section From K105+036.83 To K109+000.00	10760/PL/P1/02/634 Sheet 2 of 3	0
2.2.6	**Detailed Topographic Drawings – Crossing – Recording Plan (scale 1:200) – Longitudinal Section (scale 1:200 / 1:100)**		
1	Recording Plan of Detail Drawing - Old National Road Komotini – Aalexandroupoli - Greek section From K8+006.75 To K8+146.75	10760/PL/P1/03/601 Sheet 1 of 2	0
2	Longitudinal Section - Old National Road Komotini – Aalexandroupoli - Greek Section From K8+006.75 To K8+146.75	10760/PL/P1/03/601 Sheet 2 of 2	0
2.2.7	**Greek Section - Cadastral Diagrams (scale 1:1.000)**		
1	Cadastral Diagram - Greek Section From K0+000.00 To K1A+240.95	10760/PL/P1/02/601 Sheet 3 of 3	3
2	Cadastral Diagram - Greek Section From K1A+240.95 To K3+105.04	10760/PL/P1/02/602 Sheet 3 of 3	3
3	Cadastral Diagram - Greek Section From K3+105.04 To K4+187.65	10760/PL/P1/02/603 Sheet 3 of 3	3
4	Cadastral Diagram - Greek Section From K4+187.65 To K5D+480.31	10760/PL/P1/02/604 Sheet 3 of 3	3
5	Cadastral Diagram - Greek Section From K5D+480.31 To K7+401.69	10760/PL/P1/02/605 Sheet 3 of 3	3
6	Cadastral Diagram - Greek Section From K7+401.69 To K12+187.72	10760/PL/P1/02/606 Sheet 3 of 3	3
7	Cadastral Diagram - Greek Section From K12+187.72 To K14+197.17	10760/PL/P1/02/607 Sheet 3 of 3	3
8	Cadastral Diagram - Greek Section From K14+197.17 To K16+028.62	10760/PL/P1/02/608 Sheet 3 of 3	3
9	Cadastral Diagram - Greek Section From K16+028.62 To K18+243.86	10760/PL/P1/02/609 Sheet 3 of 3	3
10	Cadastral Diagram - Greek Section From K18+243.86 To K19+1138.22	10760/PL/P1/02/610 Sheet 3 of 3	3
11	Cadastral Diagram - Greek Section From K19+1138.22 To K24+052.37	10760/PL/P1/02/611 Sheet 3 of 3	3
12	Cadastral Diagram - Greek Section From K24+052.37 To K29+080.99	10760/PL/P1/02/612 Sheet 3 of 3	3
13	Cadastral Diagram - Greek Section From K29+080.99 To K32+070.13	10760/PL/P1/02/613 Sheet 3 of 3	3
14	Cadastral Diagram - Greek Section	10760/PL/P1/02/614	3

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	From K32+070.13 To K32A+609.68	Sheet 3 of 3	
15	Cadastral Diagram - Greek Section From K32A+609.68 To K33+158.72	10760/PL/P1/02/615 Sheet 3 of 3	3
16	Cadastral Diagram - Greek Section From K33+158.72 To K36+064.32	10760/PL/P1/02/616 Sheet 3 of 3	3
17	Cadastral Diagram - Greek Section From K36+064.32 To K41+079.32	10760/PL/P1/02/617 Sheet 3 of 3	3
18	Cadastral Diagram - Greek Section From K41+079.32 To K44+101.79	10760/PL/P1/02/618 Sheet 3 of 3	3
19	Cadastral Diagram - Greek Section From K44+101.79 To K50+083.28	10760/PL/P1/02/619 Sheet 3 of 3	3
20	Cadastral Diagram - Greek Section From K50+083.28 To K53+024.60	10760/PL/P1/02/620 Sheet 3 of 3	3
21	Cadastral Diagram - Greek Section From K53+024.60 To K57+257.22	10760/PL/P1/02/621 Sheet 3 of 3	3
22	Cadastral Diagram - Greek Section From K57+257.22 To K61+027.92	10760/PL/P1/02/622 Sheet 3 of 3	3
23	Cadastral Diagram - Greek Section From K61+027.92 To K62+184.39	10760/PL/P1/02/623 Sheet 3 of 3	3
24	Cadastral Diagram - Greek Section From K62+184.39 To K65+041.26	10760/PL/P1/02/624 Sheet 3 of 3	3
25	Cadastral Diagram - Greek Section From K65+041.26 To K69+174.62	10760/PL/P1/02/625 Sheet 3 of 3	3
26	Cadastral Diagram - Greek Section From K69+174.62 To K72+107.72	10760/PL/P1/02/626 Sheet 3 of 3	3
27	Cadastral Diagram - Greek Section From K72+107.72 To K74+078.03	10760/PL/P1/02/627 Sheet 3 of 3	3
28	Cadastral Diagram - Greek Section From K74+078.03 To K76+776.31	10760/PL/P1/02/628 Sheet 3 of 3	3
29	Cadastral Diagram - Greek Section From K76+776.31 To K81+028.07	10760/PL/P1/02/629 Sheet 3 of 3	3
30	Cadastral Diagram - Greek Section From K81+028.07 To K90+061.86	10760/PL/P1/02/630 Sheet 3 of 3	3
31	Cadastral Diagram - Greek Section From K90+061.86 To K96+124.44	10760/PL/P1/02/631 Sheet 3 of 3	3
32	Cadastral Diagram - Greek Section From K96+124.44 To K100+387.16	10760/PL/P1/02/632 Sheet 3 of 3	3
33	Cadastral Diagram - Greek Section From K100+387.16 To K105+036.83	10760/PL/P1/02/633 Sheet 3 of 3	3
34	Cadastral Diagram - Greek Section From K105+036.83 To K109+000.00	10760/PL/P1/02/634 Sheet 3 of 3	3
2.2.8	**Cadastral Tables**		
1	Cadastral Table for the Surveyed Area Zone (Arithmetic)	10760-TBN-PL-P1-601	3

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2	Cadastral Table for the Surveyed Area Zone (Alphabetic)	10760-TBN-PL-P1-602	3
3	Cadastral Table for the Working Land Zone (Arithmetic)	10760-TBN-PL-P1-603	4
4	Cadastral Table for the Working Land Zone (Alphabetic)	10760-TBN-PL-P1-604	4
2.3	**SEISMIC DESIGN**		
1	Probabllistic Seismic Hazard Assessment (PSHA) Report in Greek Territory	P513-100-RP-SEI-01	0
2	Seismic Hazard Assessment Study along the Pipeline Route in Greek Territory – Phase B: Estimation of the Peak Seismic Motion Parameters at the Ground Surface and Seismic Verification of the Pipeline	10760-STU-PL-P1-521	2
2.4	**GEOLOGICAL DESIGN**		
2.4.1	**Reports**		
1	Geological / Geotechnical Reconnaissance Report Along The Pipeline Routing in Greek Territory	10760-RPT-PL-P1-504	2
2	Study of Correlation of Active Seismic Faults with the Pipeline Routing in Greek Territory	10760-STU-PL-P1-501	2
3	Study of Correlation of Active Seismic Faults with the Pipeline Routing in Scale 1:5.000 in Greek Territory	10760-STU-PL-P1-502	0
2.4.2	**Lists**		
1	Soil Classification List Along The Pipeline Routing in Greek Territory	10760-LST-PL-P1-501	1
2.4.3	**Maps / Drawings**		
1	Geological Map Scale 1:50.000 / Greek Section Map HMGS 1:50.000 – Komotini & Mytika	10760/PL/P1/01/501	3
2	Geological Map Scale 1:10.000 / Greek Section From K0+000.00 To K34+230.57	10760/PL/P1/01/511 Sheet 1 of 2	2
3	Geological Map Scale 1:10.000 / Greek Section From K34+230.57 To K109	10760/PL/P1/01/512 Sheet 1 of 2	2
4	Geological Longitudinal Section Scale 1:10.000 /1:5.000 / Greek Section From K0+000 To K34+230.57	10760/PL/P1/01/511 Sheet 2 of 2	2
5	Geological Longitudinal Section Scale 1:10.000 /1:5.000 / Greek Section From K34+230.57 To K109+000	10760/PL/P1/01/512 Sheet 2 of 2	2
6	Map of active seismic faults scale 1:50.000 Greek section Map HMGS 1:50.000 – Komotini & Mytikas	10760/PL/P1/02/513	3
7	Map of Active Seismic Faults – Scale 1:5.000 – Greek Section	10760/PL/P1/01/521	1
2.5	**GEOTECHNICAL DESIGN**		
1	Presentation of Geotechnical Investigation in Greek Territory	10760-RPT-PL-P1-502	0

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
2	Evaluation of Geotechnical Investigation and Geotechnical Study of Above Ground Installations in Greek Territory	10760-RPT-PL-P1-503	0
3	Geoelectrical Survey Study in Greek Territory	10760-RPT-CP-P1-401	0
4	Presentation and Evaluation of Soil Chemical Analysis Results in Greek Territory	10760-RPT-CP-P1-402	0
2.6	**PIPELINE DESIGN**		
2.6.1	**Pipeline Drawings – Recording Plans (scale 1:1.000) – Longitudinal Sections (scale 1:1.000 / 1:100)**		
1	Pipeline Recording Plan - Greek Section From K0+000.00 To K1A+240.95	10760/PL/P1/02/701 Sheet 1 of 2	1
2	Pipeline Longitudinal Section - Greek Section From K0+000.00 To K1A+240.95	10760/PL/P1/02/701 Sheet 2 of 2	1
3	Pipeline Recording Plan - Greek Section FROM K1A+240.95 To K3+105.04	10760/PL/P1/02/702 Sheet 1 of 2	1
4	Pipeline Longitudinal Section - Greek Section From K1A+240.95 To K3+105.04	10760/PL/P1/02/702 Sheet 2 of 2	1
5	Pipeline Recording Plan - Greek Section From K3+105.04 To K4+187.65	10760/PL/P1/02/703 Sheet 1 of 2	2
6	Pipeline Longitudinal Section - Greek Section From K3+105.04 To K4+187.65	10760/PL/P1/02/703 Sheet 2 of 2	2
7	Pipeline Recording Plan - Greek Section From K4+187.65 To K5D+480.31	10760/PL/P1/02/704 Sheet 1 of 2	2
8	Pipeline Longitudinal Section - Greek Section From K4+187.65 To K5D+480.31	10760/PL/P1/02/704 Sheet 2 of 2	2
9	Pipeline Recording Plan - Greek Section From K5D+480.31 To K7+401.69	10760/PL/P1/02/705 Sheet 1 of 2	2
10	Pipeline Longitudinal Section - Greek Section From K5D+480.31TO K7+401.69	10760/PL/P1/02/705 Sheet 2 of 2	2
11	Pipeline Recording Plan - Greek Section From K7+401.69 To K12+187.72	10760/PL/P1/02/706 Sheet 1 of 2	1
12	Pipeline Longitudinal Section - Greek Section From K7+401.69 To K12+187.72	10760/PL/P1/02/706 Sheet 2 of 2	1
13	Pipeline Recording Plan - Greek Section From K12+187.72 To K14+197.17	10760/PL/P1/02/707 Sheet 1 of 2	1
14	Pipeline Longitudinal Section - Greek Section From K12+187.72 To K14+197.17	10760/PL/P1/02/707 Sheet 2 of 2	1
15	Pipeline Recording Plan - Greek Section From K14+197.17 To K16+28.62	10760/PL/P1/02/708 Sheet 1 of 2	1
16	Pipeline Longitudinal Section - Greek Section From K14+197.17 To K16+28.62	10760/PL/P1/02/708 Sheet 2 of 2	1
17	Pipeline Recording Plan - Greek Section From K16+28.62 To K18+243.86	10760/PL/P1/02/709 Sheet 1 of 2	1
18	Pipeline Longitudinal Section - Greek Section From K16+28.62 To K18+243.86	10760/PL/P1/02/709 Sheet 2 of 2	1

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19	Pipeline Recording Plan - Greek Section From K18+243.86 To K19+1138.22	10760/PL/P1/02/710 Sheet 1 of 2	1
20	Pipeline Longitudinal Section - Greek Section From K18+243.86 To K19+1138.22	10760/PL/P1/02/710 Sheet 2 of 2	1
21	Pipeline Recording Plan - Greek Section From K19+1138.22 To K24+052.37	10760/PL/P1/02/711 Sheet 1 of 2	1
22	Pipeline Longitudinal Section - Greek Section From K19+1138.22 To K24+052.37	10760/PL/P1/02/711 Sheet 2 of 2	1
23	Pipeline Recording Plan - Greek Section From K24+052.37 To K29+080.99	10760/PL/P1/02/712 Sheet 1 of 2	1
24	Pipeline Longitudinal Section - Greek Section From K24+052.37 To K29+080.99	10760/PL/P1/02/712 Sheet 2 of 2	1
25	Pipeline Recording Plan - Greek Section From K29+080.99 To K32+070.13	10760/PL/P1/02/713 Sheet 1 of 2	1
26	Pipeline Longitudinal Section - Greek Section From K29+080.99 To K32+070.13	10760/PL/P1/02/713 Sheet 2 of 2	1
27	Pipeline Recording Plan - Greek Section From K32+070.13 To K32A+609.68	10760/PL/P1/02/714 Sheet 1 of 2	1
28	Pipeline Longitudinal Section - Greek Section From K32+070.13 To K32A+609.68	10760/PL/P1/02/714 Sheet 2 of 2	1
29	Pipeline Recording Plan - Greek Section From K32A+609.68 To K33+158.72	10760/PL/P1/02/715 Sheet 1 of 2	1
30	Pipeline Longitudinal Section - Greek Section From K32A+609.68 To K33+158.72	10760/PL/P1/02/715 Sheet 2 of 2	1
31	Pipeline Recording Plan - Greek Section From K33+158.73 To K36+064.32	10760/PL/P1/02/716 Sheet 1 of 2	1
32	Pipeline Longitudinal Section - Greek Section From K33+158.73 To K36+064.32	10760/PL/P1/02/716 Sheet 2 of 2	1
33	Pipeline Recording Plan - Greek Section From K36+064.32 To K41+079.32	10760/PL/P1/02/717 Sheet 1 of 2	1
34	Pipeline Longitudinal Section - Greek Section From K36+064.32 To K41+079.32	10760/PL/P1/02/717 Sheet 2 of 2	1
35	Pipeline Recording Plan - Greek Section From K41+079.32 To K44+101.79	10760/PL/P1/02/718 Sheet 1 of 2	1
36	Pipeline Longitudinal Section - Greek Section From K41+079.32 To K44+101.79	10760/PL/P1/02/718 Sheet 2 of 2	1
37	PIP Pipeline Recording Plan - Greek Section From K44+101.79 To K50+083.28	10760/PL/P1/02/719 Sheet 1 of 2	1
38	Pipeline Longitudinal Section - Greek Section From K44+101.79 To K50+083.28	10760/PL/P1/02/719 Sheet 2 of 2	1
39	PIP Pipeline Recording Plan - Greek Section From K50+083.28 To K53+024.60	10760/PL/P1/02/720 Sheet 1 of 2	1
40	Pipeline Longitudinal Section - Greek Section From K50+083.28 To K53+024.60	10760/PL/P1/02/720 Sheet 2 of 2	1
41	Pipeline Recording Plan - Greek Section	10760/PL/P1/02/721	1

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
	From K53+024.60 To K57+257.22	Sheet 1 of 2	
	Pipeline Longitudinal Section - Greek Section	10760/PL/P1/02/721	1
42	From K53+024.60 To K57+257.22	Sheet 2 of 2	
	Pipeline Recording Plan - Greek Section	10760/PL/P1/02/722	1
43	From K57+257.22 To K61+027.92	Sheet 1 of 2	
	Pipeline Longitudinal Section - Greek Section	10760/PL/P1/02/722	1
44	From K57+257.22 To K61+027.92	Sheet 2 of 2	
	Pipeline Recording Plan - Greek Section	10760/PL/P1/02/723	1
45	From K61+027.92 To K62+184.39	Sheet 1 of 2	
	Pipeline Longitudinal Section - Greek Section	10760/PL/P1/02/723	1
46	From K61+027.92 To K62+184.39	Sheet 2 of 2	
	Pipeline Recording Plan - Greek Section	10760/PL/P1/02/724	1
47	From K62+184.39 To K65+041.26	Sheet 1 of 2	
	Pipeline Longitudinal Section - Greek Section	10760/PL/P1/02/724	1
48	From K62+184.39 To K65+041.26	Sheet 2 of 2	
	Pipeline Recording Plan - Greek Section	10760/PL/P1/02/725	1
49	From K65+041.26 To K69+174.62	Sheet 1 of 2	
	Pipeline Longitudinal Section - Greek Section	10760/PL/P1/02/725	1
50	From K65+041.26 To K69+174.62	Sheet 2 of 2	
	Pipeline Recording Plan - Greek Section	10760/PL/P1/02/726	1
51	From K69+174.62 To K72+107.72	Sheet 1 of 2	
	Pipeline Longitudinal Section - Greek Section	10760/PL/P1/02/726	1
52	From K69+174.62 To K72+107.72	Sheet 2 of 2	
	Pipeline Recording Plan - Greek Section	10760/PL/P1/02/727	1
53	From K72+107.72 To K74+078.03	Sheet 1 of 2	
	Pipeline Longitudinal Section - Greek Section	10760/PL/P1/02/727	1
54	From K72+107.72 To K74+078.03	Sheet 2 of 2	
	Pipeline Recording Plan - Greek Section	10760/PL/P1/02/728	1
55	From K74+078.03 To K76+776.31	Sheet 1 of 2	
	Pipeline Longitudinal Section - Greek Section	10760/PL/P1/02/728	1
56	From K74+078.03 To K76+776.31	Sheet 2 of 2	
	Pipeline Recording Plan - Greek Section	10760/PL/P1/02/729	1
57	From K76+776.31 To K81+028.07	Sheet 1 of 2	
	Pipeline Longitudinal Section - Greek Section	10760/PL/P1/02/729	1
58	From K76+776.31 To K81+028.07	Sheet 2 of 2	
	Pipeline Recording Plan - Greek Section	10760/PL/P1/02/730	1
59	From K81+028.07 To K90+061.86	Sheet 1 of 2	
	Pipeline Longitudinal Section - Greek Section	10760/PL/P1/02/730	1
60	From K81+028.07 To K90+061.86	Sheet 2 of 2	
	Pipeline Recording Plan - Greek Section	10760/PL/P1/02/731	1
61	From K90+061.86 To K96+124.44	Sheet 1 of 2	
	Pipeline Longitudinal Section - Greek Section	10760/PL/P1/02/731	1
62	From K90+061.86 To K96+124.44	Sheet 2 of 2	
	Pipeline Recording Plan - Greek Section	10760/PL/P1/02/732	1
63	From K96+124.44 To K100+387.16	Sheet 1 of 2	

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
64	Pipeline Longitudinal Section - Greek Section From K96+124.44 To K100+387.16	10760/PL/P1/02/732 Sheet 2 of 2	1
65	Pipeline Recording Plan - Greek Section From K100+387.16 To K105+036.83	10760/PL/P1/02/733 Sheet 1 of 2	1
66	Pipeline Longitudinal Section - Greek Section From K100+387.16 To K105+036.83	10760/PL/P1/02/733 Sheet 2 of 2	1
67	Pipeline Recording Plan - Greek Section From K105+036.83 To K109+000.00	10760/PL/P1/02/734 Sheet 1 of 2	1
68	Pipeline Longitudinal Section - Greek Section From K105+036.83 To K109+000.00	10760/PL/P1/02/734 Sheet 2 of 2	1
2.6.2	**Pipeline Drawings for Crossings – Recording Plans (scale 1:200) – Longitudinal Sections (scale 1:200 / 1:100)**		
1	Pipeline Crossing Recording Plan (Scale 1:200) with the O.N.R. Alexandroupoli – Komotini - Greek Section From K8+006.75 To K8+146.75	10760/PL/P1/03/701 Sheet 1 of 2	1
2	Pipeline Crossing Longitudinal Section (Scale 1:200 / 1:100) with the O.N.R. Alexandroupoli – Komotini - Greek Section From K8+006.75 To K8+146.75	10760/PL/P1/03/701 Sheet 2 of 2	1
3	**BLOCK VALVE STATION BV1 - NIMFEA**		
3.1	**TOPOGRAPHICAL / CADASTRAL**		
3.1.1	**Topographic Survey Plans**		
1	Topographical Survey Plan - Recommended location of Nimfea Block Valve Station (BV1)/ Greek section - From K84+072.66 To K85+005.97	10760/CI/B1/01/401	0
2	Topographical Survey Plan - Alternative Location of Nimfea Block Valve Station (BV1) / Greek Section From K85+045.56 To K87+021.56	10760/CI/B1/01/402	0
3	Topographical Survey Plan - Alternative Location of Nimfea Block Valve Station (BV1) / Greek Section From K96+147.20 To K98+008.60	10760/CI/B1/01/403	0
3.1.2	**Cadastral Survey Plans**		
1	Cadastral Survey Plan - Recommended location of Nimfea Block Valve Station (BV1)/ Greek section - From K84+072.66 To K85+005.97	10760/CI/B1/01/411	0
2	Cadastral Survey Plan - Alternative Location of Nimfea Block Valve Station (BV1) / Greek Section From K85+045.56 To K87+021.56	10760/CI/B1/01/412	0
3	Cadastral Survey Plan - Alternative Location of Nimfea Block Valve Station (BV1) / Greek Section From K96+147.20 To K98+008.60	10760/CI/B1/01/413	0
3.2	**CIVIL AND STRUCTURAL DESIGN**		
3.2.1	**Calculations**		
1	Nimfea Block Valve Station (BV1) –	10760-CLC-CI-B1-401	0

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
	Structural Calculations for RCC Building		
2	Nimfea Block Valve Station (BV1) – Stormwater Drainage Calculations	10760-CLC-CI-B1-402	0
3.2.2	**Technical Description**		
1	Nimfea Block Valve Station (BV1) - Technical Description for Civil & Electromechanical Works for RCC Building	10760-RPT-CI-B1-401	1
3.2.3	**Drawings**		
1	Nimfea Block Valve Station (BV1) – Plot Plan	10760/CI/B1/01/404	1
2	Nimfea Block Valve Station (BV1) – Building Coverage Diagram	10760/CI/B1/01/405	0
3	Nimfea Block Valve Station (BV1) – General Excavation Plan	10760/CI/B1/01/406	0
4	Nimfea Block Valve Station (BV1) – RCC Building – Formwork – Reinforcement – Details	10760/CI/B1/03/401	0
3.2.4	**MTO**		
1	Nimfea Block Valve Station (BV1) – Civil Works MTO	10760-MTO-CI-B1-401	0
3.3	**ARCHITECTURAL DESIGN**		
3.3.1	**Drawings**		
1	Nimfea Block Valve Station (BV1) – RCC Building – Plans	10760/CI/B1/02/501	0
2	Nimfea Block Valve Station (BV1) – RCC Building – Elevations – Sections	10760/CI/B1/02/502	0
3.4	**BULDING MECHANICAL DESIGN**		
3.4.1	**Calculations**		
1	Nimfea Block Valve Station (BV1) - RCC Building – Fire Fighting System Calculations	10760-CLC-ME-B1-401	0
2	Nimfea Block Valve Station (BV1) – RCC Building – H.V.A.C. System Calculations	10760-CLC-ME-B1-402	0
3.4.2	**Material Requisitions**		
1	Nimfea Block Valve Station (BV1) – RCC Building – Material Requisition for Fire Suppression Systems and Portable Fire Extinguishers	10760-TRN-ME-B0-401	0
2	Nimfea Block Valve Station (BV1) –Material Requisition for HVAC Equipment	10760-TRN-EL-B0-404	0
3.4.3	**Reports**		
1	Nimfea Block Valve Station (BV1) – RCC Building – Thermal Insulation Study	10760-STU-ME-B1-401	0
3.4.4	**Drawings**		
1	Nimfea Block Valve Station (BV1) – RCC Building – Fire Fighting System Layout	10760/ME/B1/06/601	0
2	Nimfea Block Valve Station (BV1) – RCC Building – H.V.A.C. System Layout	10760/ME/B1/06/701	0
3.5	**MECHANICAL / PIPING**		
3.5.1	**Reports**		

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
1	Nimfea Block Valve Station (BV1) – Piping Stress Analysis Report	10760-RPT-PL-B1-401	0
3.5.2	**Drawings**		
1	Nimfea Block Valve Station (BV1) – Piping Arrangement	10760/ME/B1/02/401	0
2	Nimfea Block Valve Station (Bv1) – Piping Isometric	10760/ME/B1/05/401	0
3.5.3	**MTO**		
1	Nimfea Block Valve Station (BV1) – MTO List	10760-MTO-ME-B1-401	0
3.6	**ELECTRICAL DESIGN**		
3.6.1	**Calculations**		
1	Lighting Calculations for Block Valve Station BV1	10760-CLC-EL-P1-401	0
2	Lightning Protection System Calculations for Block Valve Station BV1	10760-CLC-EL-P1-402	2
3	Power Network Calculations for Block Valve Station BV1	10760-CLC-EL-B1-401	0
3.6.2	**Material Requisitions**		
1	Material Requisition for LV Distribution Boards for Block Valve Stations / Pigging Stations	10760-TRN-EL-B0-401	1
2	Material Requisition for UPS System for Block Valve Stations / Pigging Stations	10760-TRN-EL-B0-402	1
3	Material Requisition for LV Distribution Boards for Block Valve Stations / Pigging Stations	10760-TRN-EL-B0-403	1
4	Material Requisition for Cables for Block Valve Stations / Pigging Stations	10760-TRN-EL-B0-405	1
3.6.3	**Reports**		
1	Technical Report for Power Supply requirements for Block Valve Stations in Greek Territory	10760-RPT-EL-P1-401	0
3.6.4	**Lists**		
1	Nimfea Block Valve Station (BV1) – Electrical Load List	10760-LST-EL-B1-401	0
3.6.5	**Drawings**		
1	Nimfea Block Valve Station (BV1) – One Line Diagrams	10760/EL/B1/01/401	0
2	Nimfea Block Valve Station (BV1) – Cable Routing and Earthing Layout	10760/EL/B1/04/401	0
3	Nimfea Block Valve Station (BV1) – Hazardous Area Claccification	10760/EL/B1/05/401	0
4	Nimfea Block Valve Station (BV1) – RCC Building – Lightning Protection System Layout	10760/EL/B1/06/401	0
5	Nimfea Block Valve Station (BV1) – RCC Building - Earthing System Layout	10760/EL/B1/06/402	0
6	Nimfea Block Valve Station (BV1) – RCC Building – Power and Lighting Layout	10760/EL/B1/07/401	0
7	Nimfea Block Valve Station (BV1) – RCC Building - Electrical Equipment Layout	10760/EL/B1/08/401	0
3.6.6	**MTO**		
1	Nimfea Block Valve Station (BV1) – Electrical Works MTO	10760-LST-EL-B1-402	1

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
4	**KOMOTINI GAS METERING STATION**		
4.1	**TOPOGRAPHICAL / CADASTRAL**		
1	Topographical Survey Plan - Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) - Greek section From K1+363.56 To K1A+173.79	10760-RPT-TP-A1-401	1
2	Cadastral Survey Plan - Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) - Greek section From K1+363.56 To K1A+173.79	10760/CI/A1/01/411	1
4.2	**CIVIL AND STRUCTURAL DESIGN**		
4.2.1	**Calculations**		
1	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Structural Calculations for Control & Boiler Building	10760-CLC-CI-A1-401	0
2	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Structural Calculations for Gas Filters Foundations	10760-CLC-CI-A1-402	0
3	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) - Structural Calculations for Gas Pre-Heaters Foundations	10760-CLC-CI-A1-403	0
4	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Structural Calculations for Condensate Collector Pit	10760-CLC-CI-A1-404	0
5	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Structural Calculations for Water Tank Pit	10760-CLC-CI-A1-405	0
6	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Stormwater drainage calculations	10760-CLC-CI-A1-411	0
4.2.2	**Technical Description**		
1	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Technical Description for Civil Works	10760-RPT-CI-A1-401	1
4.2.3	**Drawings**		
1	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Plot Plan	10760/CI/A1/01/402	1
2	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Building Coverage Diagram	10760/CI/A1/01/403	0
3	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – General Excavation Plan	10760/CI/A1/03/411	0
4	Komotini Gas Metering Station (GMS1) and Pigging Station (PS1) – Stormwater drainage system layout	10760/CI/A1/03/412	0
5	Komotini Gas Metering Station (GMS1) and Pigging Station (PS1) - Stormwater drainage system layout	10760/CI/A1/05/401	0
6	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Gas Filters Foundations – Formwork & Reinforcement	10760/CI/A1/03/401	0

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
7	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) - Gas Preheaters Foundations – Formwork & Reinforcement	10760/CI/A1/03/402	0
8	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) - Condensate Collector Pit – Formwork & Reinforcement	10760/CI/A1/03/403	0
9	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Water Tank Pit – Formwork & Reinforcement	10760/CI/A1/03/404	0
10	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Miscellaneous Foundations – Formwork & Reinforcement	10760/CI/A1/03/405	0
11	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Control & Boiler Building – Foundation Formwork – Reinforcement – Details	10760/CI/A1/03/411	0
12	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Control & Boiler Building – Ground Floor Formwork – Reinforcement – Details	10760/CI/A1/03/412	0
4.2.4	**MTO**		
1	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) - Civil Works MTO	10760-MTO-CI-A1-401	0
4.3	**ARCHITECTURAL DESIGN**		
4.3.1	**Reports**		
1	Komotini Gas Metering Station (GMS1 - Passive Fire Protection Report	10760-RPT-CI-A1-501	0
4.3.2	**Drawings**		
1	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) Control & Boiler Building / Ground Floor Plan	10760/CI/A1/02/501	0
2	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) Control & Boiler Building / Roof Plan	10760/CI/A1/02/502	0
3	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Control & Boiler Building / Sections & Details	10760/CI/A1/02/503	0
4	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Control & Boiler Building / Elevations	10760/CI/A1/02/504	0
5	Komotini Gas Metering Station (GMS1) - Passive Fire Protection Layout	10760/CI/A1/02/505	0
4.4	**BULDING MECHANICAL DESIGN**		
4.4.1	**Calculations**		
1	Water Supply Calculations for Komotini Gas Metering Station (GMS1) / Pigging Station (PS1)	10760-CLC-ME-A1-401	0
2	Sanitary Calculations for Komotini Gas Metering Station (GMS1) / Pigging Station (PS1)	10760-CLC-ME-A1-402	0

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
3	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Control & Boiler Building - Fire Fighting System Calculations	10760-CLC-ME-A1-403	1
4	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Control & Boiler Building – H.V.A.C. System Calculations	10760-CLC-ME-A1-404	0
4.4.2	**Material Requisitions**		
1	Komotini Gas Metering Station (GMS / Pigging Station PS1) – Control & Boiler Building – Material Requisition for Fire Suppression Systems and Portable Fire Extinguishers	10760-TRN-ME-M0-401	0
2	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Material Requisition for HVAC Equipment	10760-TRN-ME-00-402	0
4.4.3	**Reports**		
1	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Control & Boiler Building – Thermal Insulation Study	10760-STU-ME-A1-401	0
4.4.4	**Technical Descriptions**		
1	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) Technical Description for Buildings Mechanical Installations and Services in Greek Territory	10760-RPT-ME-00-401	0
4.4.5	**Drawings**		
1	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Water Supply System – General Layout & Schematic Diagram	10760/ME/A1/06/401	0
2	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Sewer System – General Layout & Schematic Diagram	10760/ME/A1/06/501	0
3	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Control & Boiler Building – Fire Suppression System Layout & Schematic Diagram	10760/ME/A1/06/601	0
4	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Control & Boiler Building – H.V.A.C. System – Ground Floor Layout	10760/ME/A1/06/701 Sheet 1 of 2	0
5	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Control & Boiler Building – H.V.A.C. System – Roof Level Layout	10760/ME/A1/06/701 Sheet 2 of 2	0
6	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Control & Boiler Building – H.V.A.C. System – Piping Diagram	10760/ME/A1/06/702	0
4.4.6	**MTO**		
1	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Building Mechanical Installations MTO List	10760-MTO-ME-A1-401	1
4.5	**MECHANICAL / PIPING**		
4.5.1	**Reports**		
1	Komotini Gas Metering & Pigging Station (GMS1 & PS1 – Piping Stress Analysis Report	10760-RPT-ME-A1-401	0

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
4.5.2	**Drawings**		
1	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Piping Arrangement	10760/ME/A1/02/401 Sheet 1 of 2	0
2	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Piping Arrangement	10760/ME/A1/02/401 Sheet 2 of 2	0
3	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Piping Isometric	10760/ME/A1/05/401 Sheet 1 of 9	0
4	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Piping Isometric	10760/ME/A1/05/401 Sheet 2 of 9	0
5	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Piping Isometric	10760/ME/A1/05/401 Sheet 3 of 9	0
6	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Piping Isometric	10760/ME/A1/05/401 Sheet 4 of 9	0
7	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Piping Isometric	10760/ME/A1/05/401 Sheet 5 of 9	0
8	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Piping Isometric	10760/ME/A1/05/401 Sheet 6 of 9	0
9	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Piping Isometric	10760/ME/A1/05/401 Sheet 7 of 9	0
10	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Piping Isometric	10760/ME/A1/05/401 Sheet 8 of 9	0
11	Komotini Gas Metering Station (GMS1) & Pigging Station (PS1) – Piping Isometric	10760/ME/A1/05/401 Sheet 9 of 9	0
4.5.3	**MTO**		
1	Komotini Gas Metering Station (GMS1) / Pigging Station (PS1) - Piping MTO List	10760-MTO-ME-A1-402	0
4.6	**ELECTRICAL DESIGN**		
4.6.1	**Calculations**		
1	Power Network Calculations for Komotini Gas Metering Station (GMS1) / Pigging Station (PS1)	10760-CLC-EL-A1-401	0
2	Lighting Calculations for Komotini Gas Metering Station (GMS1) / Pigging Station (PS1)	10760-CLC-EL-A1-402	0
3	Lightning Protection System Calculations Komotini Gas Metering Station (GMS1) / Pigging Station (PS1)	10760-CLC-EL-A1-403	2
4.6.2	**Material Requisitions**		
1	Material Requisition for LV Distribution Boards for GMS / AGRS Stations	10760-TRN-EL-M0-401	1
2	Material Requisition for UPS System for GMS / AGRS Stations	10760-TRN-EL-M0-402	1
3	Material Requisition for Emergency Generators for GMS / AGRS Stations	10760-TRN-EL-M0-403	1
4	Material Requisition for Earthing and Lightning Protection System for GMS / AGRS Stations	10760-TRN-EL-M0-404	1
5	Material Requisition for Cables for GMS / AGRS Stations	10760-TRN-EL-M0-405	1

Item No	DRAWING / DOCUMENT TITLE	DRAWING / DOCUMENT NUMBER	Rev.
4.6.3	**Lists**		
1	Electrical Load List for Komotini Gas Metering Station (GMS1) / Pigging Station (PS1)	10760-LST-EL-A1-401	0
4.6.4	**Reports**		
1	Technical Report for Power Supply requirements for Komotini Gas Metering Station (GMS) / Pigging Station (PS1)	10760-RPT-EL-A1-401	0
4.6.5	**Drawings**		
1	Komotini Gas Metering Station (GMS1) / Pigging Station (PS1) – One Line Diagrams	10760/EL/A1/01/401	0
2	Komotini Gas Metering Station (GMS1) / Pigging Station (PS1) – Electrical Distribution Boards Block Diagram	10760/EL/A1/02/403	0
3	Plot Plan for Komotini Gas Metering Station (GMS1) / Pigging Station (PS1) – Outline Cable Routing	10760/EL/A1/04/401	0
4	Hazardous Area Classification for Plot Plan for Komotini Gas Metering Station (GMS1) / Pigging Station (PS1)	10760/EL/A1/05/401	0
5	Plot Plan for Komotini Gas Metering Station (GMS1) / Pigging Station (PS1) – Outline Earthing Layout	10760/EL/A1/06/401	0
6	Komotini Gas Metering Station (GMS1) / Pigging Station (PS1) – Control & Boiler Building – Earthing Layout	10760/EL/A1/06/402	0
7	Komotini Gas Metering Station (GMS1) / Pigging Station (PS1) – Control & Boiler Building – Lightning Protection System Layout	10760/EL/A1/06/403	0
8	Komotini Gas Metering Station (GMS1) / Pigging Station (PS1) – Control & Boiler Building – Power and Lighting Layout	10760/EL/A1/07/401	0
9	Komotini Gas Metering Station (GMS1) / Pigging Station (PS1) – Control & Boiler Building – Electrical Equipment Layout	10760/EL/A1/08/401	0
4.6.6	**MTO**		
1	Electrical Works MTO Komotini Gas Metering Station (GMS1) / Pigging Station (PS1)	10760-LST-EL-A1-402	0

Legend:

Process Automation
Telecommunication