



European flagship Action for cold ironING in ports



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Activity 3 FEED Studies for the ports of Black Sea

Onshore Power Supply - Step Closer for Green Ports in Europe

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Burgas, 27 June 2023

1

FEED Studies for the port of Burgas

2

FEED Studies for the port of Varna

3

FEED Studies for the port of Constanta

A large, bold, blue number '1' is positioned on the left side of the slide. The background is a gradient of blue and green, with a white curved shape on the right side.

FEED Studies for the port of Burgas

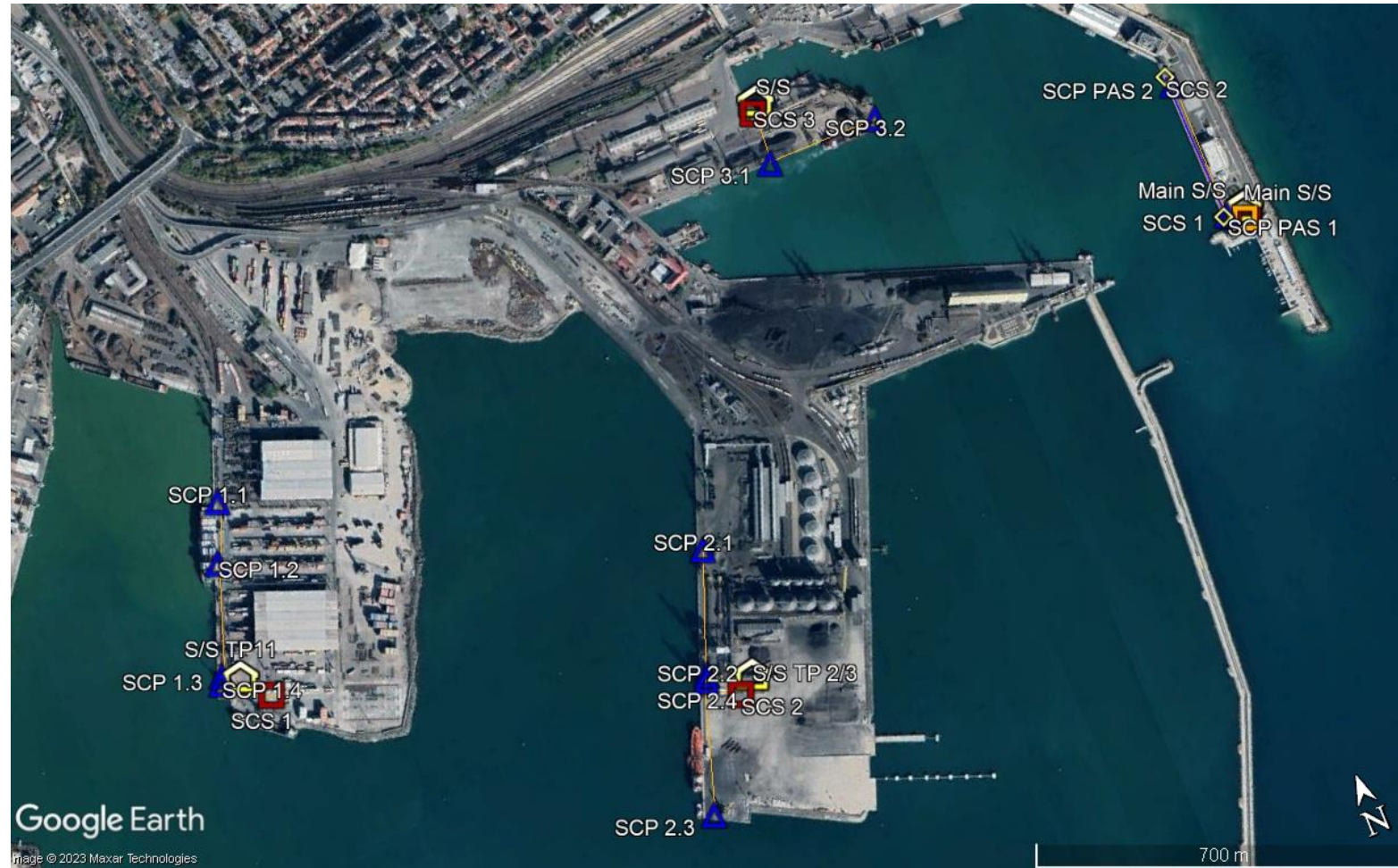


SSE Berthing Positions

SSE berthing position	Location	Power (MVA)	Voltage (kV)	Vessel Type
SCP 1.1	Berth 22 (West)	2.5	6.6	<i>Container/General Cargo</i>
SCP 1.2	Berth 23 (West)	2.5	6.6	<i>Container/General Cargo</i>
SCP 1.3	Berth 24 (West)	2.5	6.6	<i>General Cargo</i>
SCP 1.4	Berth 24 (West)	7.5	6.6	<i>General Cargo</i>
SCP 2.1	Berth 30 (East)	2.5	6.6	<i>Crude Oil/General Cargo</i>
SCP 2.2	Berth 31 (East)	2.5	6.6	<i>General Cargo</i>
SCP 2.3	Berth 32 (East)	2.5	6.6	<i>Crude Oil/General Cargo</i>
SCP 2.4	Berth 31 (East)	7.5	6.6	<i>General Cargo</i>
SCP PAS	PAS (East)	16	11	<i>Cruise</i>
SCP 3.1	Berth 11	4	11	<i>Passenger</i>
SCP 3.2	Berth 12	2	6.6	<i>General Cargo</i>



SSE Berthing Positions



Burgas West SSE – Berthing Position SSE 1

Shore Connection Substation 1

Incoming MV Switchgear

Step down transformer (8MVA, 20 kV/3.3 kV)

Frequency Converter (8 MVA)

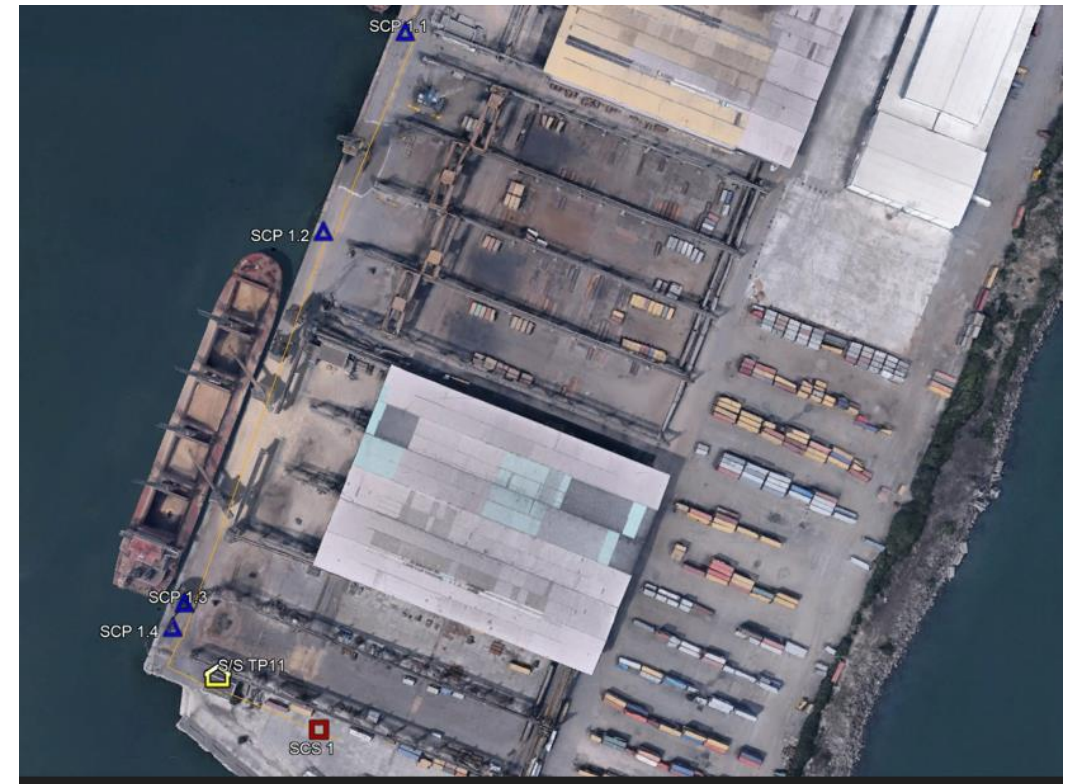
Step-up and Isolation Transformer for the SCP
1.4 (8MVA, 3.3 kV/6.6 kV)

Isolation Transformer for the SCP 1.1, 1.2 & 1.3
(2.5MVA, 6,6 kV/6.6 kV)

Outgoing MV Switchgear

Protection, Control and Monitoring System

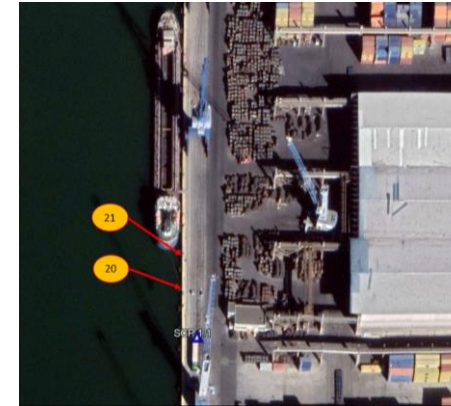
SCADA System



Burgas West SSE – Berthing Position SSE 1

Cable Management System

Shore Connection Point	Type of CMS	Position
SCP1.1	Mobile Type	Berth No22
SCP1.2	Fixed Connection Point	Berth No23
SCP1.3	Mobile Type	Berth No24
SCP1.4	Fixed Connection point	Berth No24



Burgas East SSE – Berthing Position SSE 2

Shore Connection Substation 2

Incoming MV Switchgear

Step down transformer (8MVA, 20 kV/3.3 kV)

Frequency Converter (8 MVA)

Step-up and Isolation Transformer for the SCP 2.4 (8MVA, 3.3 kV/6.6 kV)

Isolation Transformer for the SCP 2.1, 2.2 & 2.3 (2.5MVA, 6,6 kV/6.6 kV)

Outgoing MV Switchgear

Protection, Control and Monitoring System

SCADA System

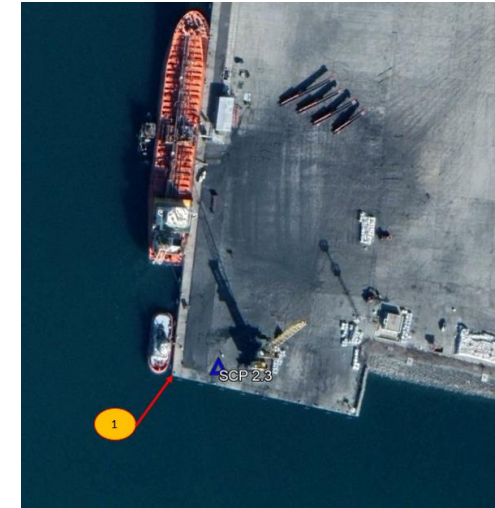
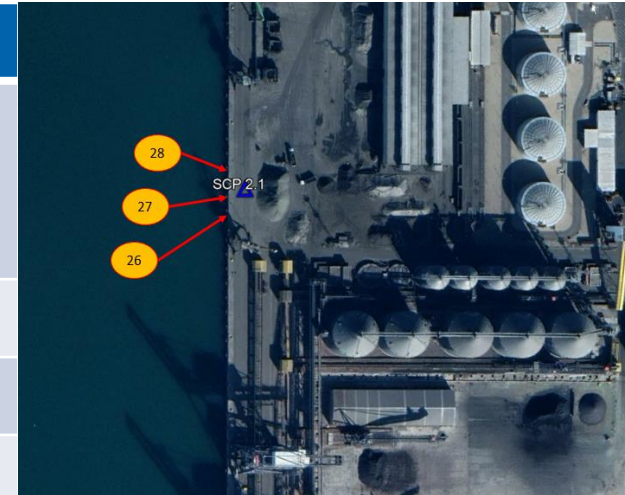




Burgas West SSE – Berthing Position SSE 2

Cable Management System

Shore Connection Point	Type of CMS	Position
SCP2.1	Mobile Type	Berth No30
SCP2.2	Mobile Type	Berth No31
SCP2.3	Fixed Connection point	Berth No32/33
SCP2.4	Fixed Connection point-junction box	Berth No31



Burgas East SSE – Berthing Position SSE 3

Shore Connection Substation 3

Incoming MV Switchgear

Outgoing MV Switchgear

Step-down Transformer (4MVA, 20 kV/3.3 kV)

Step-down Transformer (2MVA, 20 kV/0.4 kV)

Frequency Converter (4 MVA)

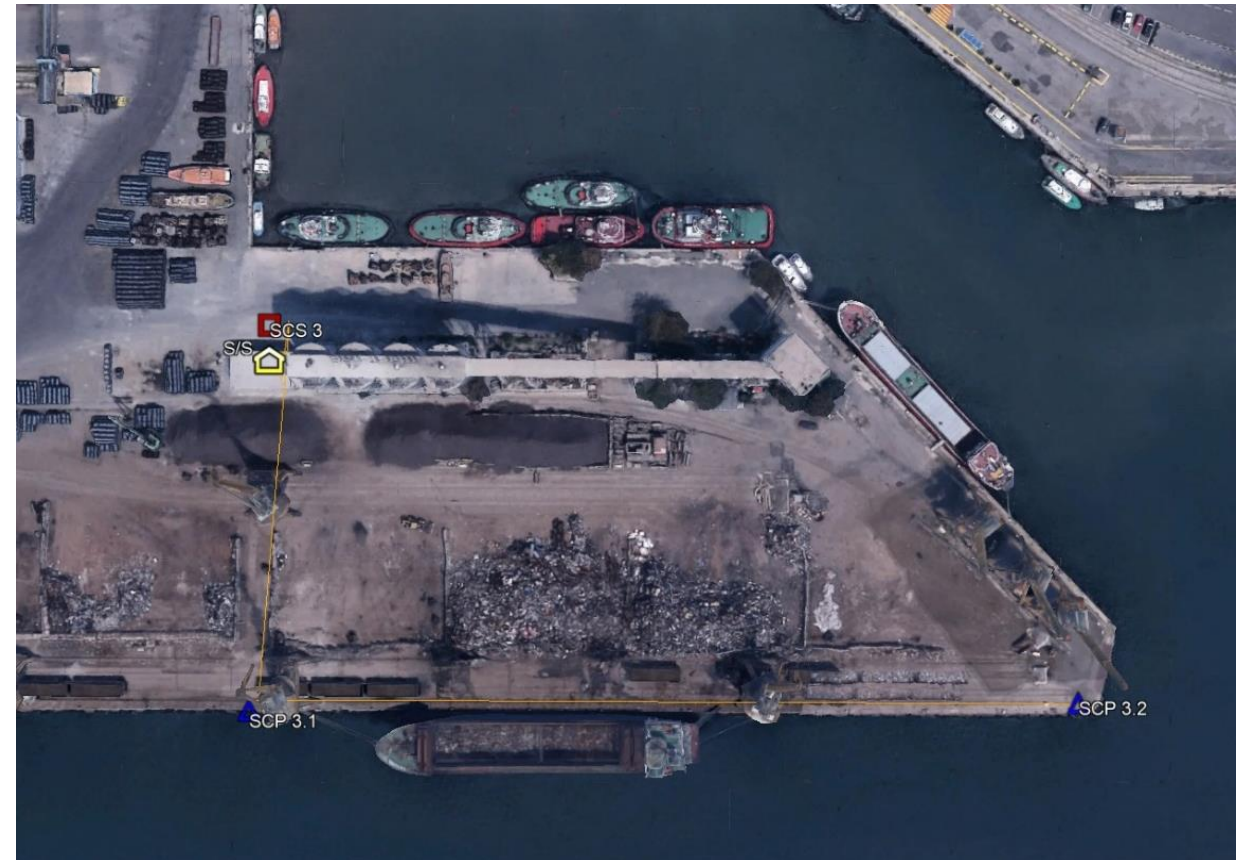
Frequency Converter (2 MVA)

Step-up Transformer (4MVA, 3.3 kV/11 kV)

Step-down Transformer (2MVA, 0.4 kV/6.6 kV)

Protection, Control and Monitoring System

SCADA System

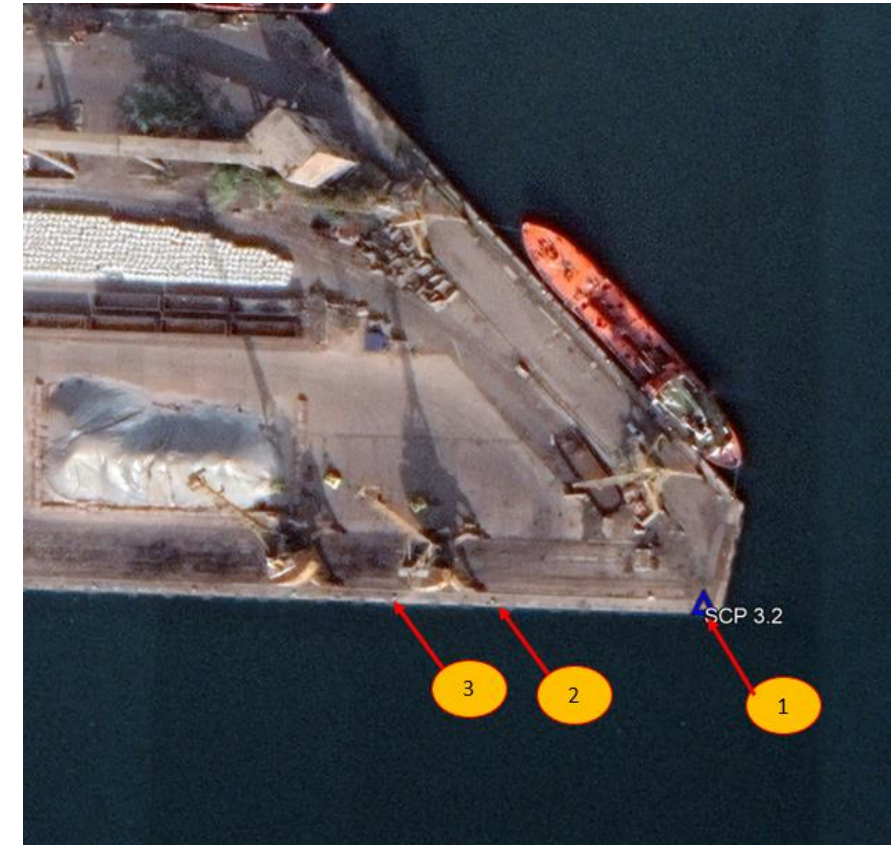




Burgas West SSE – Berthing Position SSE 3

Cable Management System

Shore Connection Point	Type of CMS	Position
SCP3.1	Mobile Type	Bollard No10/11
SCP3.2	Mobile Type	Bollard No1/2



Burgas East SSE – Berthing Position SSE PAS

Shore Connection Substation PAS

Incoming MV Switchgear

Outgoing MV Switchgear

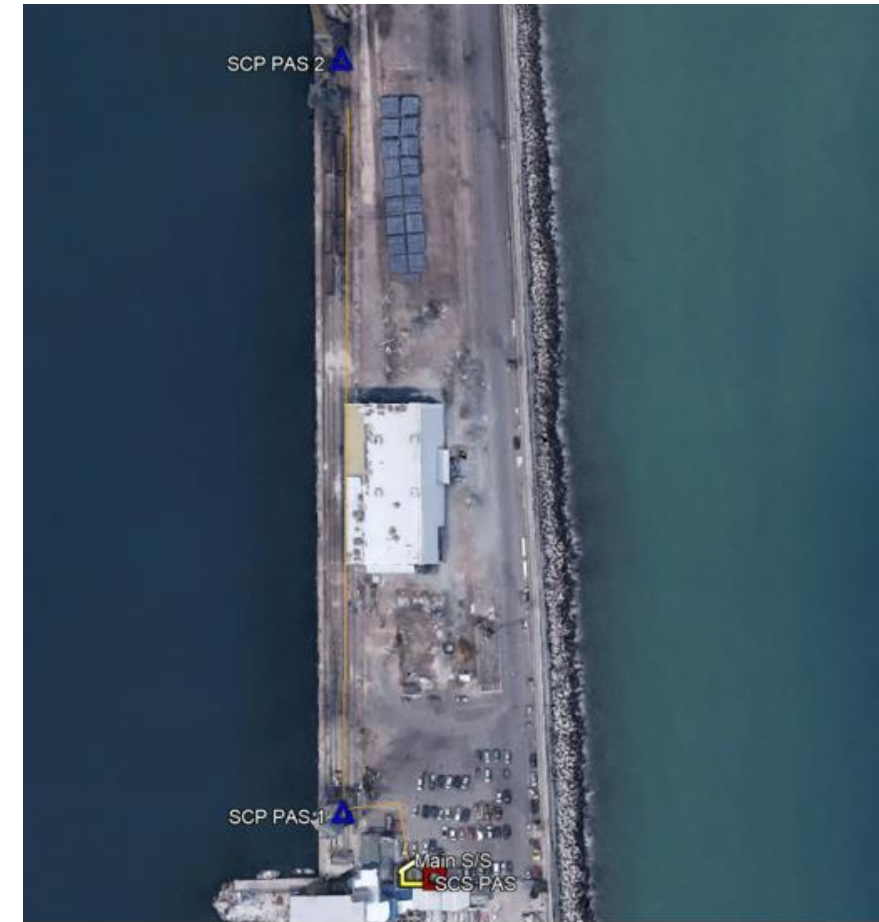
MV/MV Transformer (16MVA, 20 kV/4x1.85 kV)

MV/MV Transformer (16MVA, 3.3 kV/11 kV)

Frequency Converter (16 MVA)

Protection, Control and Monitoring System

SCADA System

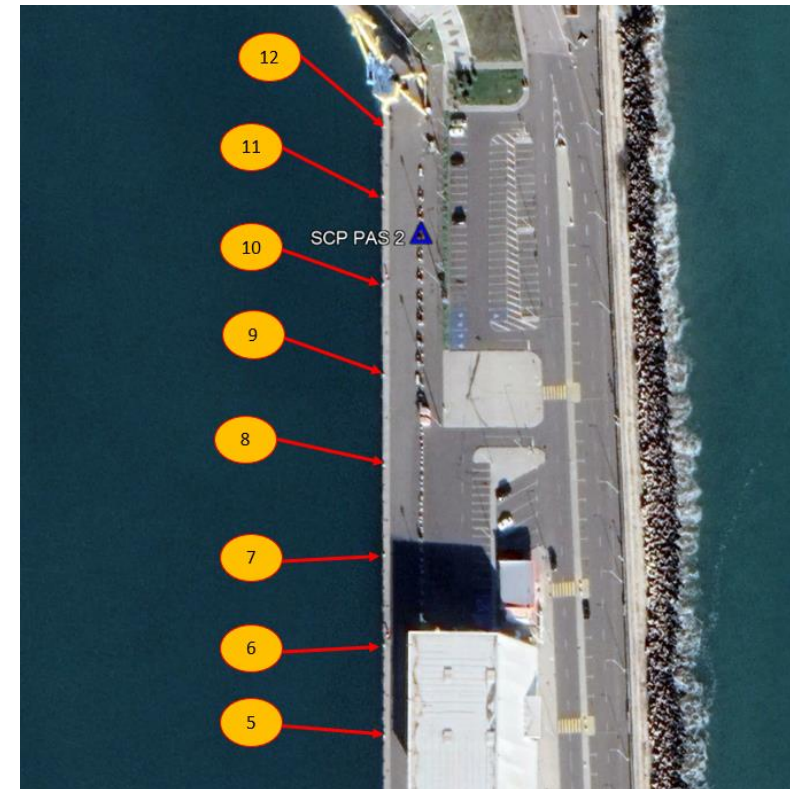
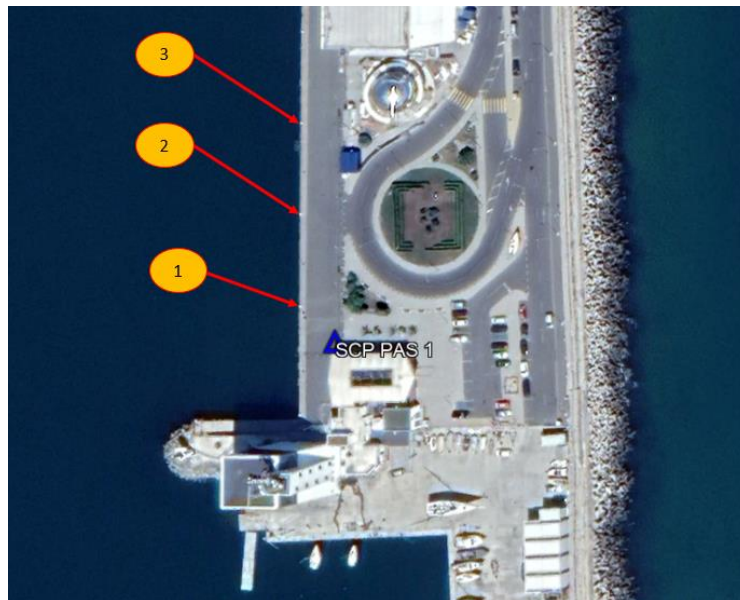




Burgas West SSE – Berthing Position SSE PAS

Cable Management System

Shore Connection Point	Type of CMS	Position
SCPPAS1	Mobile Type	Bollard No2
SCPPAS2	Mobile Type	Bollard No10/11



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FEED Studies for the port of Varna

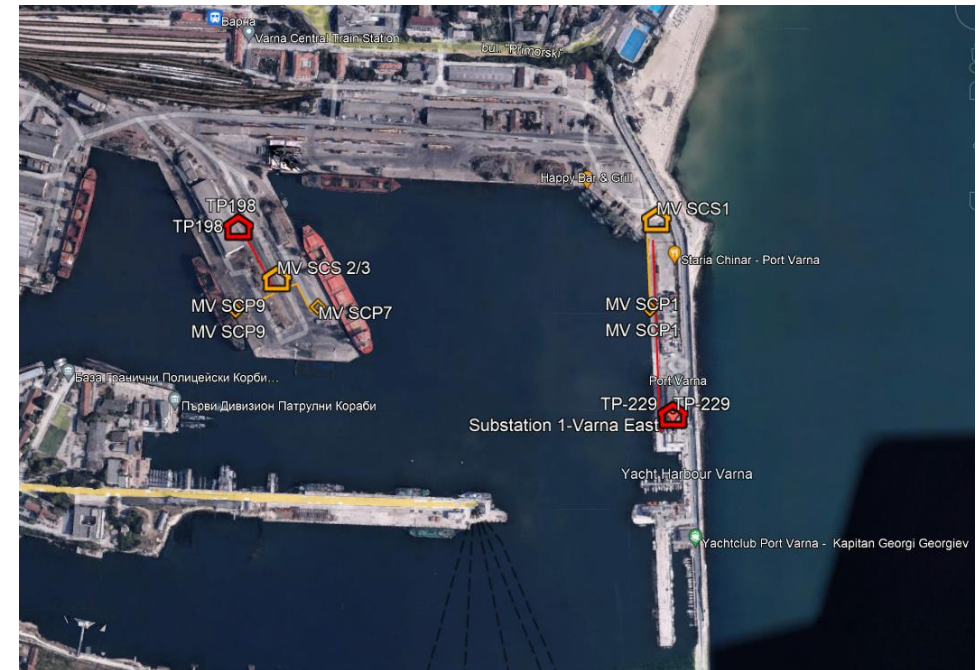
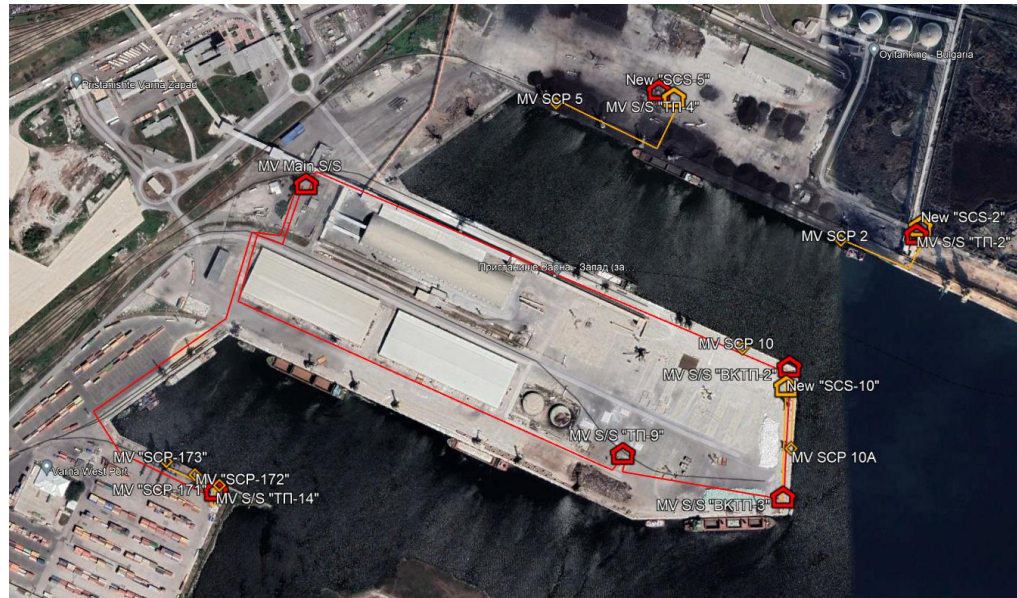


SSE Berthing Positions

SSE berthing position	Location	Power (MVA)	Voltage (kV)	Vessel Type
2	Berth 2/Varna West	3	6.6	<i>Chemical Tanker/Tanker</i>
5	Berth 5/Varna West	1	6.6	<i>Bulk Carrier Dry</i>
10	Berth 10/Varna West	1	6.6	<i>Bulk Carrier Dry/ General Cargo</i>
10a	Berth 10a/Varna West	1	6.6	<i>Bulk Carrier Dry/ General Cargo</i>
17	Berth 17/Varna West	3	6.6	<i>General Cargo Ship/Container</i>
1	Berth 1/Varna East	2	11	<i>Passenger</i>
7	Berth 7 Varna East	2	6.6	<i>General Cargo Ship</i>
9	Berth 9 Varna East	1.5	6.6	<i>Bulk Carrier Dry/ Chemical Tanker</i>



SSE Berthing Positions





Varna West SSE (chemical tanker) – Berthing Position SSE 2

Shore Connection Substation 2

Incoming MV Switchgear

Outgoing MV Switchgear

MV/LV Transformer (3MVA, 20 kV/0.4kV)

LV/MV Transformer (3MVA, 0.4 kV/6.6 kV)

Frequency Converter (2x1,5 MVA)

Protection, Control and Monitoring System

SCADA System



Cable Management System

Shore Connection Point	Type of CMS	Position
SCP2	Fixed Type	Bollards 21/22





Varna West SSE (bulk) – Berthing Position SSE 5

Shore Connection Substation 5

- Incoming MV Switchgear
- Outgoing MV Switchgear
- MV/LV Transformer (1MVA, 20 kV/0.4kV)
- LV/MV Transformer (1MVA, 0.4 kV/6.6 kV)
- Frequency Converter (1 MVA)
- Protection, Control and Monitoring System
- SCADA System

Cable Management System

Shore Connection Point	Type of CMS	Position
SCP5	Fixed Type	Bollards 40/41



Varna West SSE (container) – Berthing Position SSE 17

Shore Connection Substation 17

Incoming MV Switchgear

Outgoing MV Switchgear

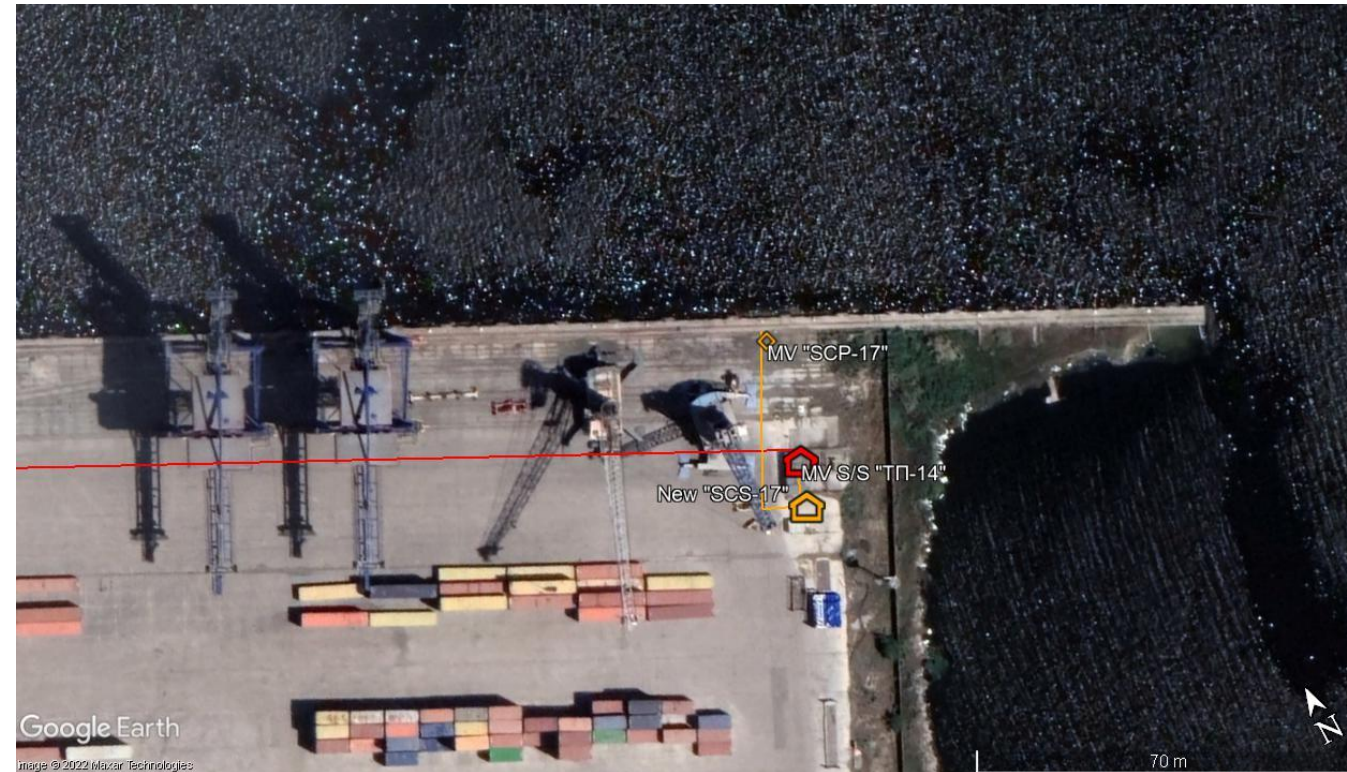
MV/LV Transformer (3MVA, 20 kV/0.4 kV)

LV/MV Transformer (3MVA, 0.4 kV/6.6 kV)

2xFrequency Converter (1.5 MVA)

Protection, Control and Monitoring System

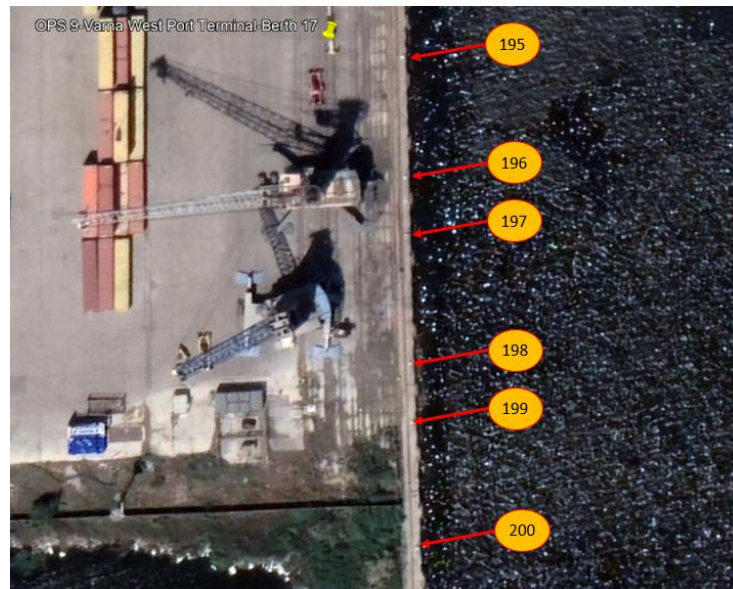
SCADA System



Varna West SSE (container) – Berthing Position SSE 17

Cable Management System

Shore Connection Point	Type of CMS	Position
SCP17.1	Fixed connection points/junction box	Bollard No197/198
SCP17.2	Fixed connection points/junction box	Bollard No188/189
SCP17.3	Fixed connection points/junction box	Bollard No199/200



Varna West (Bulk) SSE – Berthing Position SSE 10

Shore Connection Substation 10

Incoming MV Switchgear

Outgoing MV Switchgear

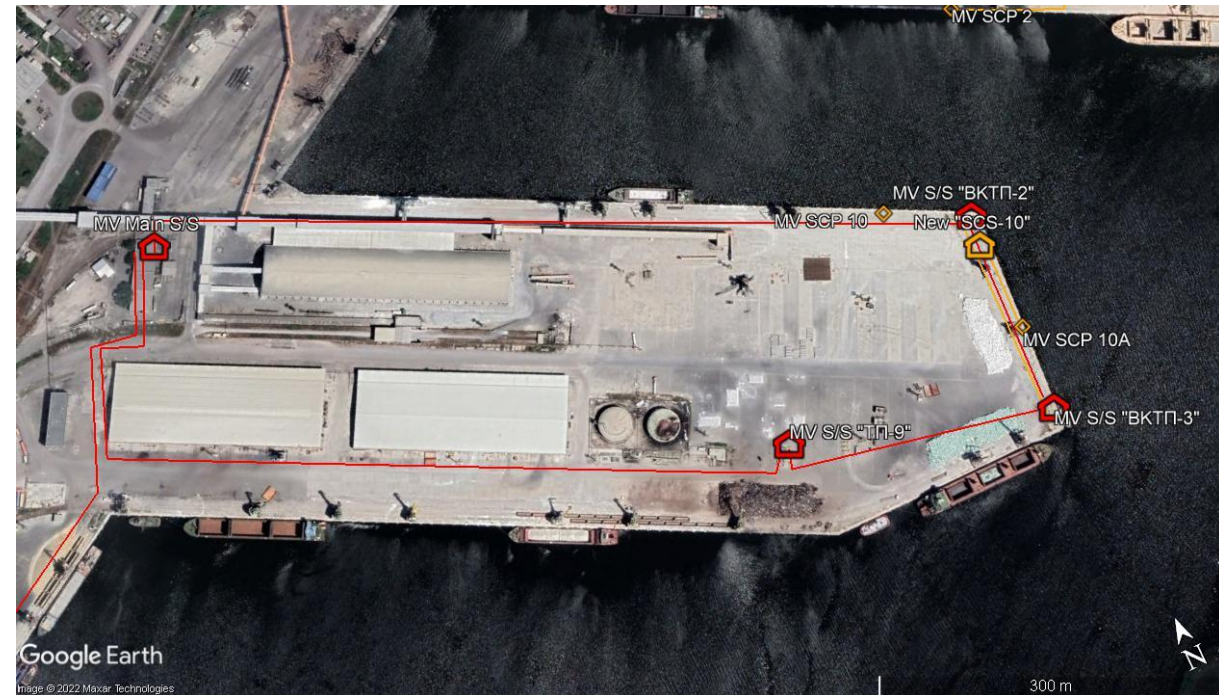
2xMV/LV Transformer (1MVA, 20 kV/0.4 kV)

2xLV/MV Transformer (1MVA, 0.4 kV/6.6 kV)

2xFrequency Converter (1 MVA)

Protection, Control and Monitoring System

SCADA System



Varna East 2 SSE – Berthing Position SSE 10

Cable Management System

Shore Connection Point	Type of CMS	Position
SCP10	Mobile Type	Bollard No101/102
SCP10A	Mobile Type	Bollard No108/109



Varna East SSE – Berthing Position SSE 1

Shore Connection Substation 1

Incoming MV Switchgear

Outgoing MV Switchgear

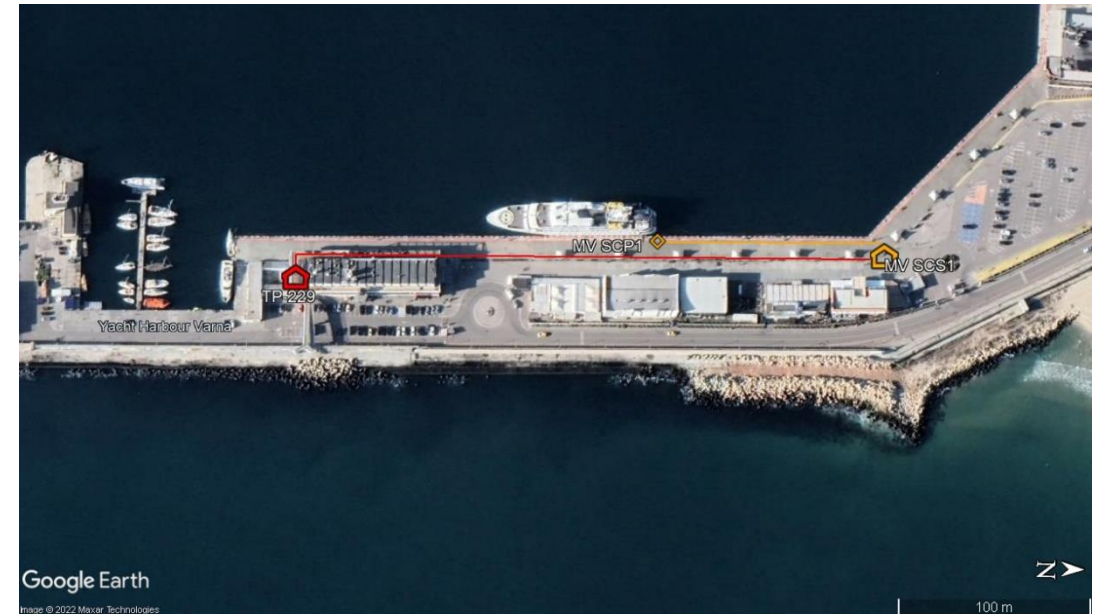
MV/LV Transformer (2MVA, 20 kV/0.4 kV)

LV/MV Transformer (2MVA, 0.4 kV/11 kV)

Frequency Converter (2 MVA)

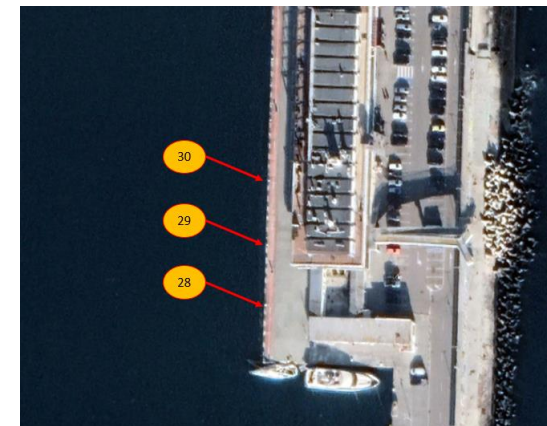
Protection, Control and Monitoring System

SCADA System



Cable Management System

Shore Connection Point	Type of CMS	Position
SCP1	Mobile Type	Bollard No28/29



Varna East SSE (general Cargo & Bulk) – Berthing Position SSE 7 & 9

Shore Connection Substation 23

Incoming MV Switchgear

Outgoing MV Switchgear

MV/LV Transformer (2MVA, 20 kV/0.4kV)

MV/LV Transformer (1.5MVA, 20 kV/0.4kV)

LV/MV Transformer (2MVA, 0.4 kV/6.6 kV)

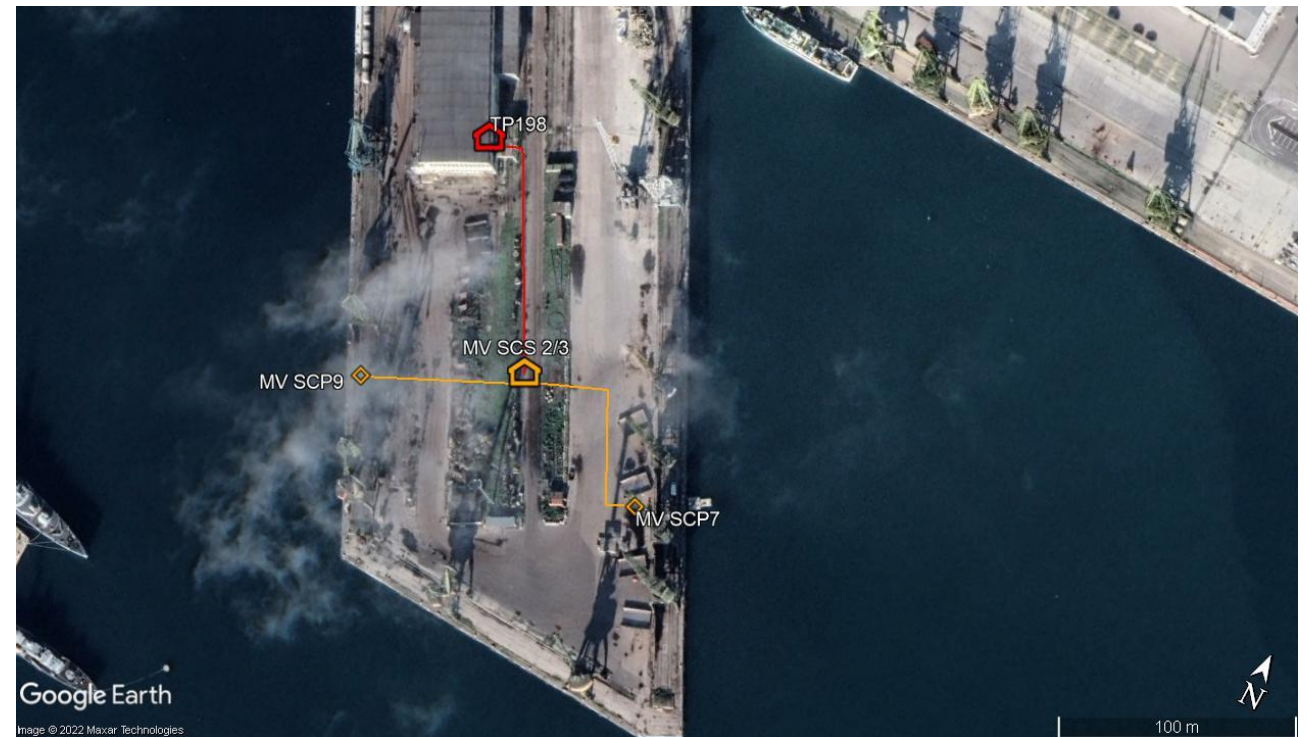
LV/MV Transformer (1.5MVA, 0.4 kV/6.6 kV)

Frequency Converter (1.5 MVA)

Frequency Converter (1.5 MVA)

Protection, Control and Monitoring System

SCADA System



Varna East SSE – Berthing Position SSE 7 & 9

Cable Management System

Shore Connection Point	Type of CMS	Position
SCP7	Fixed type	Berth No7
SCP9	Fixed type	Bollard No99/100



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FEED Studies for the port of Constanta

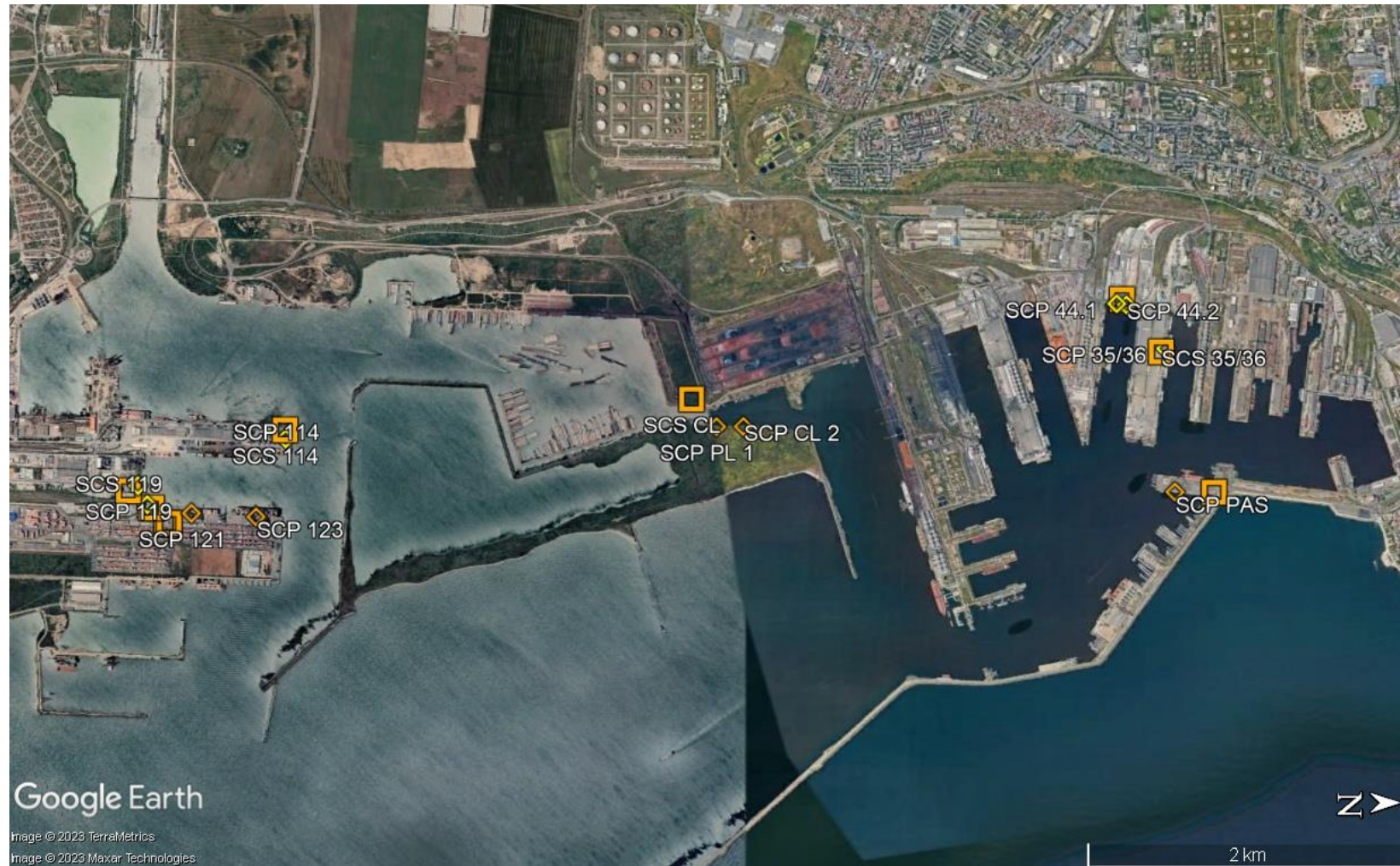


SSE Berthing Positions

SSE berthing position	Location	Power (MVA)	Voltage (kV)	Vessel Type
SSE 1	PAS	5	11	<i>Ro-Pax</i>
SSE 2	Berth 35/36	1	0.44/0.4	<i>Bulk</i>
SSE 3	Berth 44	1	0.44/0.4	<i>Bulk</i>
SSE 4	Berth CL	5	6.6	<i>LNG Carriers</i>
SSE 5	Berth PL6	1	0.44/0.4	<i>Ro-Ro</i>
SSE 6	Berth 114	1	0.44/0.4	<i>Bulk</i>
SSE 7	Berth 119	1	0.44/0.4	<i>Bulk</i>
SSE 8	Berth 120	1	0.44/0.4	<i>Car carriers</i>
SSE 9	Berth 121	5	6.6	<i>Container</i>
SSE 10	Berth 123	5	6.6	<i>Container</i>



SSE Berthing Positions

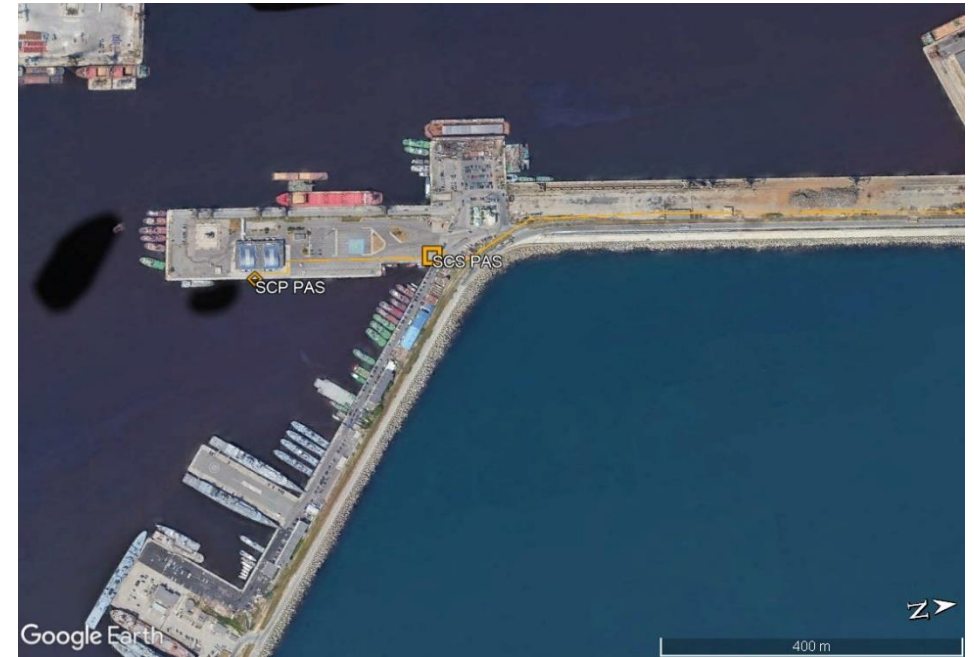




Passenger Terminal-Berthing Position SSE 1

Shore Connection Substation 2

- Incoming MV Switchgear
- Outgoing MV Switchgear
- MV/MV Transformer (20 or 6.6 kV/3.3 kV)
- MV/MV Transformer (3.3 kV/11 kV)
- Frequency Converter (5 MVA)
- Protection, Control and Monitoring System
- SCADA System



Cable Management System

Shore Connection Point	Type of CMS	Position
SCP1	Fixed Type/Telescopic crane	Bollards 21/22





Berth 35/36 (bulk) - Berthing Position SSE 2

Shore Connection Substation 2

Incoming MV Switchgear

Outgoing MV Switchgear

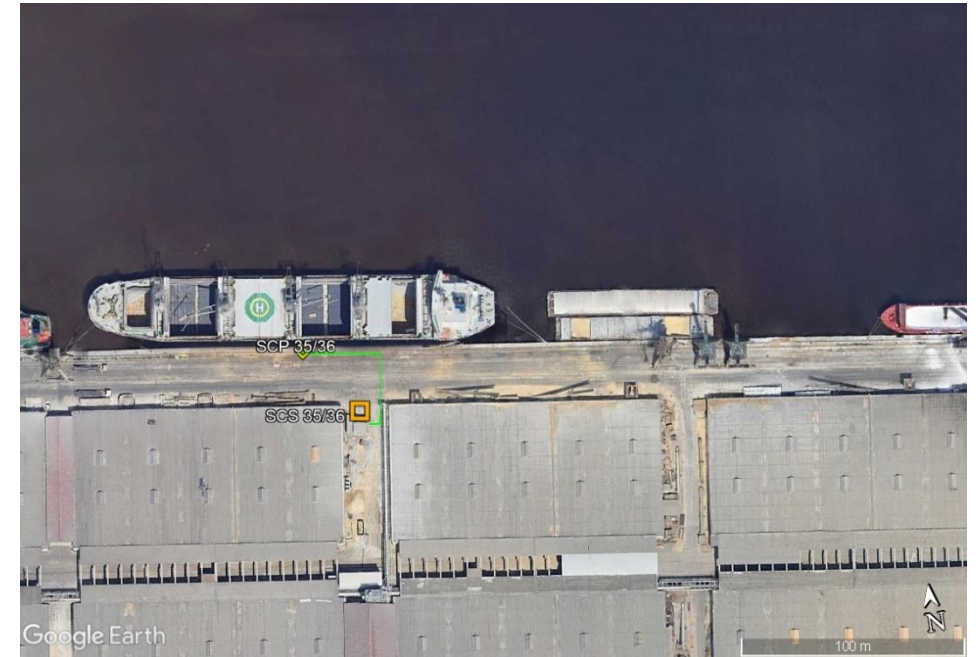
MV/LV Transformer (1MVA, 20 or 6.6 kV/0.4 kV)

LV/LV Transformer (1MVA, 0.4 kV/0.4 or 0.44 kV)

Frequency Converter (1 MVA)

Protection, Control and Monitoring System

SCADA System



Cable Management System

Shore Connection Point	Type of CMS	Position
SCP2.1	Mobile Type	Berth 35/36
SCP2.2	Mobile Type	Berth 35/36





Berth 44 (bulk) - Berthing Position SSE 3

Shore Connection Substation 3

Incoming MV Switchgear

Outgoing MV Switchgear

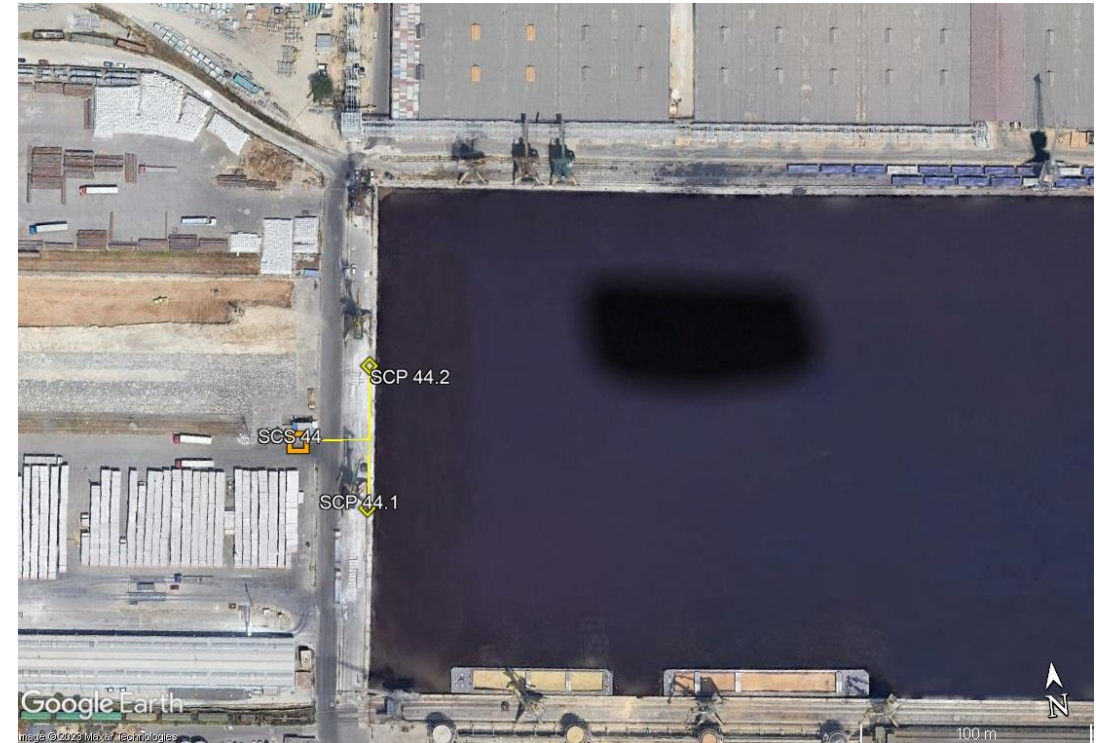
MV/LV Transformer (1MVA, 20 or 6.6 kV/0.4 kV)

LV/LV Transformer (1MVA, 0.4 kV/0.4 or 0.44 kV)

Frequency Converter (1 MVA)

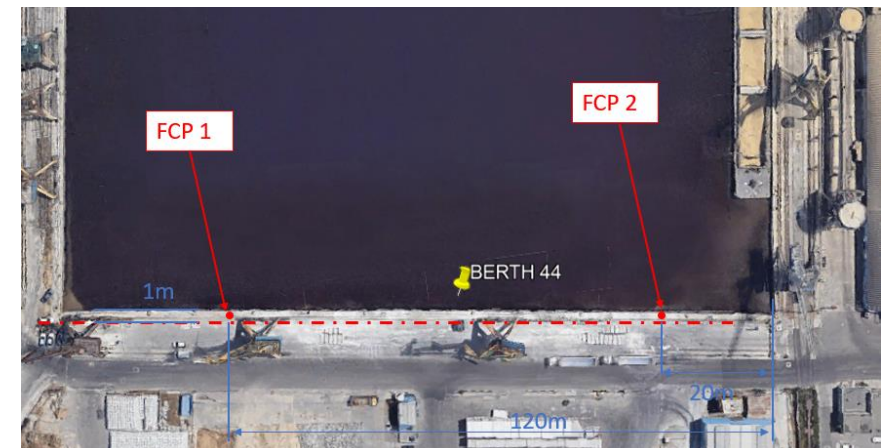
Protection, Control and Monitoring System

SCADA System



Cable Management System

Shore Connection Point	Type of CMS	Position
SCP3.1	Fixed Connection Point	Berth 44
SCP3.2	Fixed Connection Point	Berth 44





Berth CL (LNG) -Berthing Position SSE 4

Shore Connection Substation 4

Incoming MV Switchgear

Outgoing MV Switchgear

MV/MV Transformer (20 or 6.6 kV/3.3 kV)

MV/MV Transformer (3.3 kV /6.6 kV)

Frequency Converter (5 MVA)

Protection, Control and Monitoring System

SCADA System



Cable Management System

Shore Connection Point	Type of CMS	Position
SCP4.1	Mobile Type	Berth CL
SCP4.2	Mobile Type	Berth CL





Berth PL6 (Ro/Ro) -Berthing Position SSE 5

Shore Connection Substation 5

Incoming MV Switchgear

Outgoing MV Switchgear

MV/LV Transformer (20 kV/0.4 kV)

LV/LV Transformer (0.4 kV /0.4 or 0.44 kV)

Frequency Converter (1 MVA)

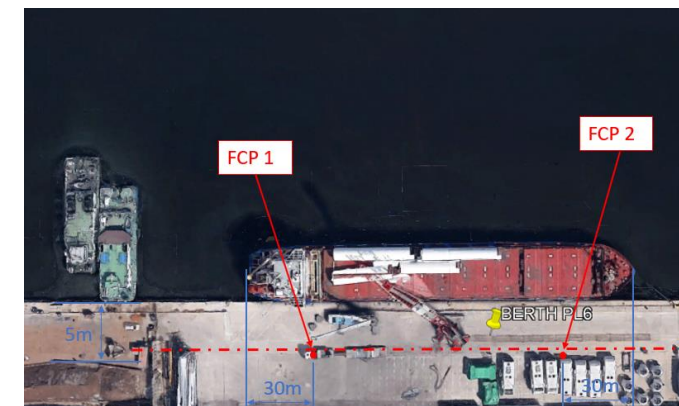
Protection, Control and Monitoring System

SCADA System



Cable Management System

Shore Connection Point	Type of CMS	Position
SCP5.1	Mobile Type	Berth PL6
SCP5.2	Mobile Type	Berth PL6





Berth 114 (bulk) - Berthing Position SSE 6

Shore Connection Substation 6

Incoming MV Switchgear

Outgoing MV Switchgear

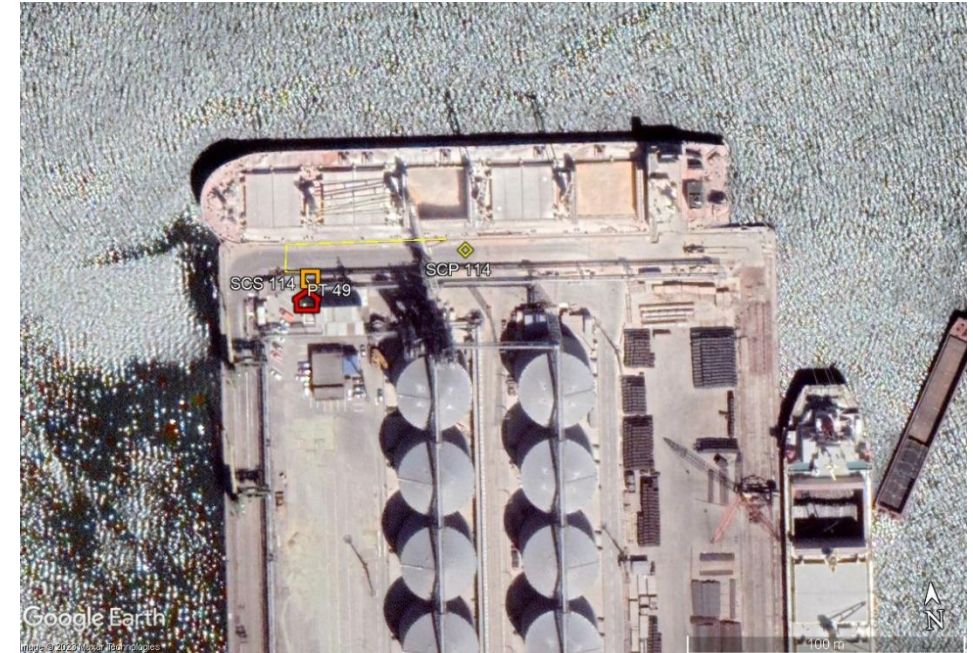
MV/LV Transformer (20 kV/0.4 kV)

LV/LV Transformer (0.4 kV /0.4 or 0.44 kV)

Frequency Converter (1 MVA)

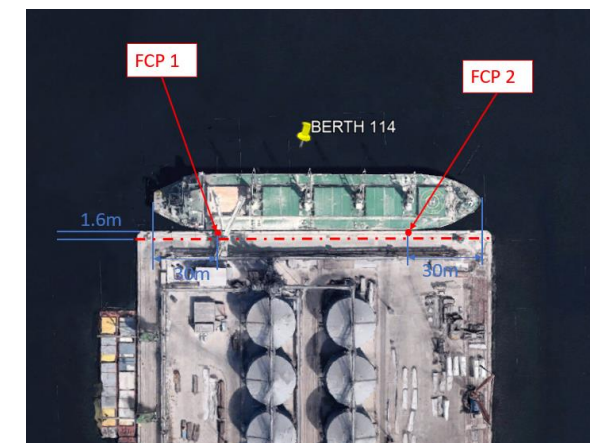
Protection, Control and Monitoring System

SCADA System



Cable Management System

Shore Connection Point	Type of CMS	Position
SCP6.1	Mobile Type	Berth 114
SCP6.2	Mobile Type	Berth 114





Berth 119 (bulk) - Berthing Position SSE 7

Shore Connection Substation 7

Incoming MV Switchgear

Outgoing MV Switchgear

MV/LV Transformer (20 kV/0.4 kV)

LV/LV Transformer (0.4 kV /0.4 or 0.44 kV)

Frequency Converter (1 MVA)

Protection, Control and Monitoring System

SCADA System



Cable Management System

Shore Connection Point	Type of CMS	Position
SCP7.1	Mobile Type	Berth 119
SCP7.2	Mobile Type	Berth 119





Berth 120 -Berthing Position SSE 8

Shore Connection Substation 8

Incoming MV Switchgear

Outgoing MV Switchgear

MV/LV Transformer (20 kV/0.4 kV)

LV/LV Transformer (0.4 kV /0.4 or 0.44 kV)

Frequency Converter (1 MVA)

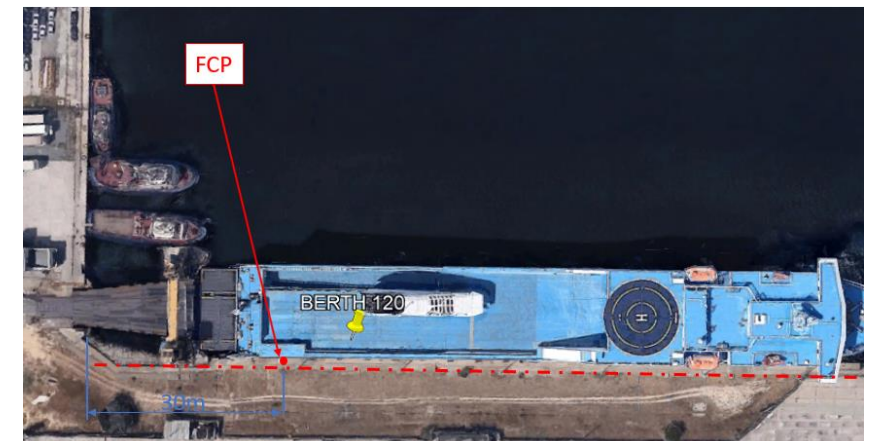
Protection, Control and Monitoring System

SCADA System



Cable Management System

Shore Connection Point	Type of CMS	Position
SCP8	Mobile Type	Berth 120





Berth 121 -Berthing Position SSE 9

Shore Connection Substation 9

Incoming MV Switchgear

Outgoing MV Switchgear

MV/MV Transformer (20 kV/3.3 kV)

MV/MV Transformer (3.3 kV /6.6 kV)

Frequency Converter (5 MVA)

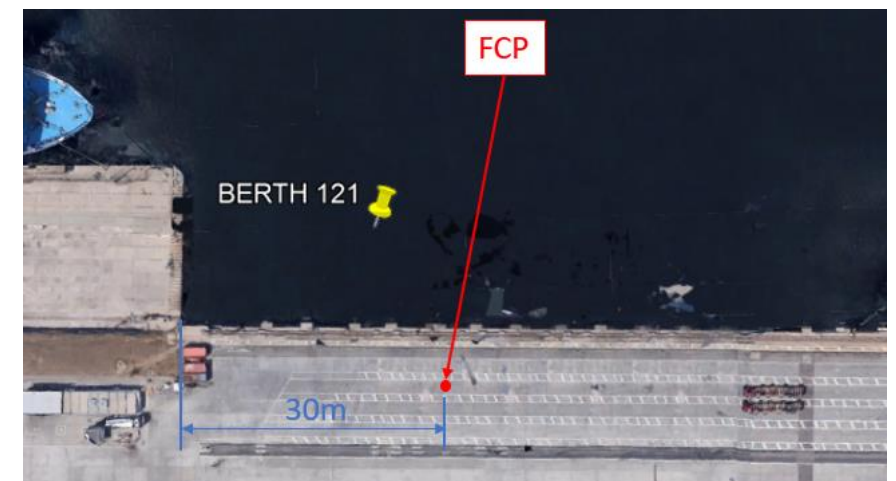
Protection, Control and Monitoring System

SCADA System



Cable Management System

Shore Connection Point	Type of CMS	Position
SCP9	Fixed Connection point	Berth 121





Berth 123 -Berthing Position SSE 10

Shore Connection Substation 10

Incoming MV Switchgear

Outgoing MV Switchgear

MV/MV Transformer (20 kV/3.3 kV)

MV/MV Transformer (3.3 kV /6.6 kV)

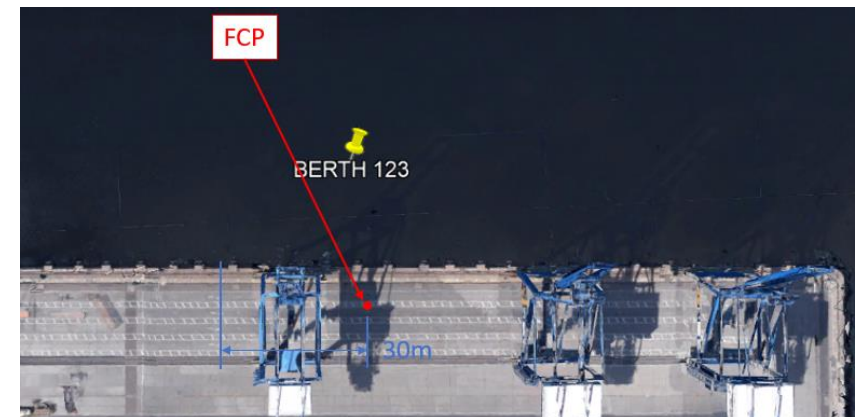
Frequency Converter (5 MVA)

Protection, Control and Monitoring System

SCADA System



Shore Connection Point	Type of CMS	Position
SCP10	Fixed Connection point	Berth 123



Thanks!



European flagship Action for coLd ironING in ports

Contacts in Activity 3:

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