Adriatic LNG project

Solid Ballast Installation and Scour Protection Installation

Adriatic LNG Terminal

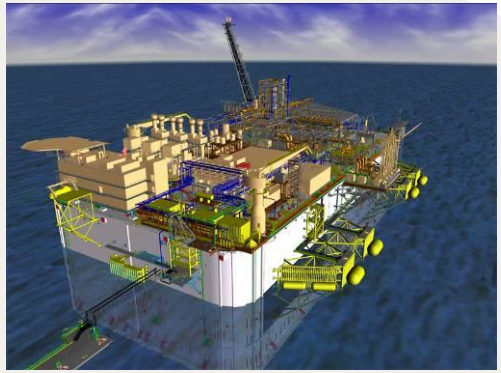
The Adriatic LNG Project involves the construction and installation of a LNG Terminal offshore Venice.

The **Gravity Based Structure (GBS)** will be the world's first in its kind. (90.000m^3 of concrete, total weight 250,000ton)

The Project is executed by **Qatar Petroleum, ExxonMobil and Edison**. Together they form the Company called **Adriatic LNG.**

Each third day a dedicated LNG carrier will deliver **153.000m^3 LNG**.

Storage capacity of the GBS: **250,000m^3 LNG**.



Adriatic LNG Terminal

The main structure of the Adriatic LNG Terminal, the **GBS**, has been constructed in Algeciras, Spain. Since 2005 until 30th of August 2008

Square **LNG tanks** specially designed for Adriatic LNG

Concrete structure adapted to the extreme low temperatures

Adriatic LNG Terminal

December 2005

November 2007

Adriatic LNG Terminal

- **Towing the GBS** over approx 1700 nm
- Estimated duration is 18 days @ average 4 knots
- Manned tow

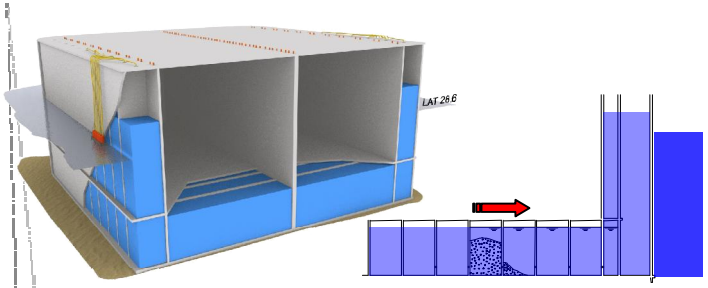
Adriatic LNG Terminal

- **Installation** at 17km from Italian shore
- Nearest port is Porto di Chioggia at the South end of the Venetian Lagoon

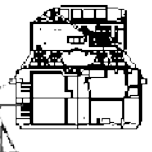
Adriatic LNG Terminal Simultaneous Operations

Activities when GBS arrives on site

1. **Ballasting** with water

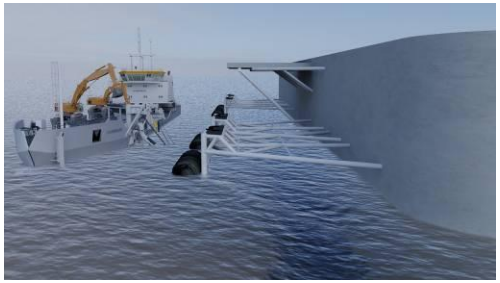


2. **Ballasting** with solid ballast => SCOPE FDC

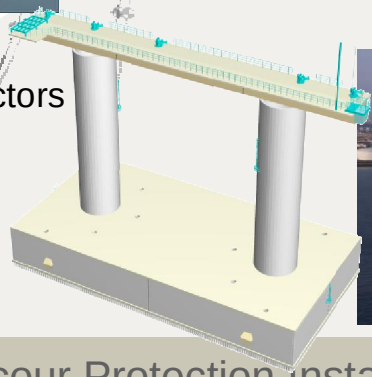


3. **Pipeline tie-in and Fibre optic connection :** scope Saipem

4. **Scour Protection Installation** => SCOPE FDC



5. **Mooring Dolphins Installation** : scope Aker Marine Contractors (with Rambiz)

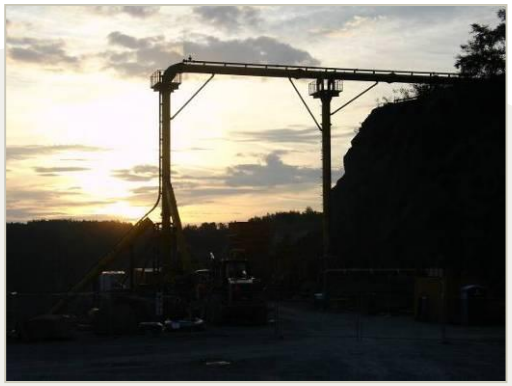


6. **Accommodation barge** 200pers

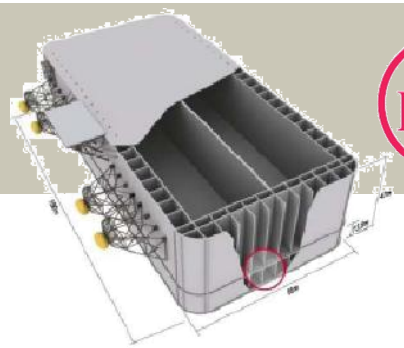
Adriatic LNG Terminal Simultaneous Operations

Scope FDC - Solid Ballast Installation

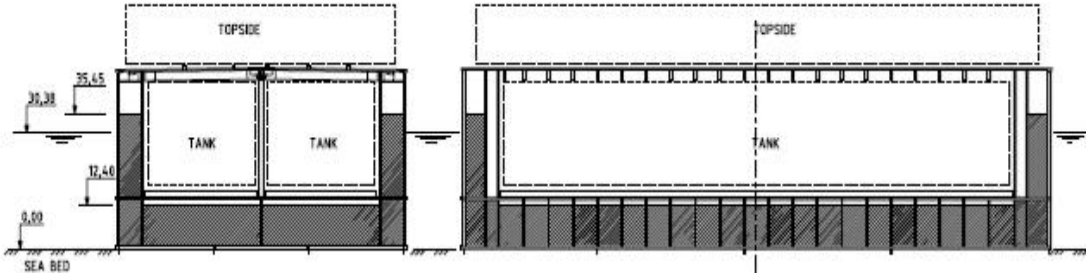
Due to the specialized requirements for the solid ballasting, a **full scale test** was done to optimize the inhouse engineering of the mixing and pumping plants in Quenast, Belgium.



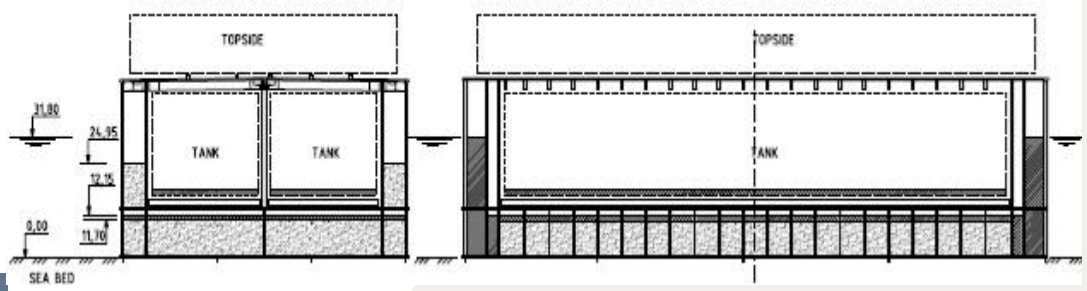
Scope FDC - Solid Ballast Installation



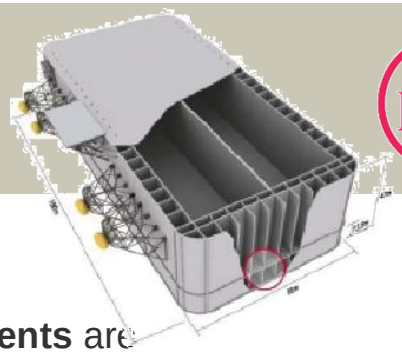
- After Towage to Venice, GBS will be set aground by ballasting with 235.500Tonnes of seawater
  - On-bottom pressure 20kN/m²
  - Stability to resist to **10-year return wave**



- Approximate 4 days after GBS is set aground Hydraulic Installation of **250,000Tonnes** of ballast sand
  - On-bottom pressure 195kN/m²
  - Stability to resist to **100-year return wave**

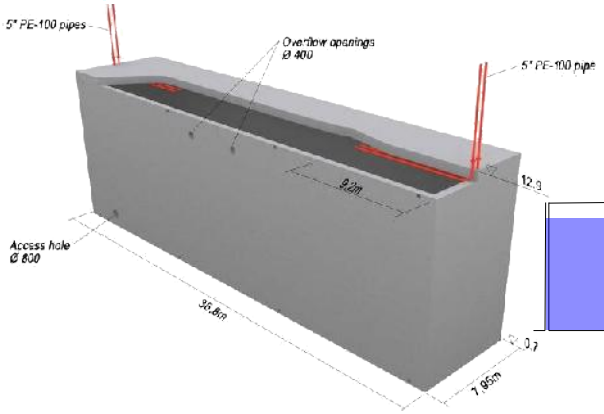


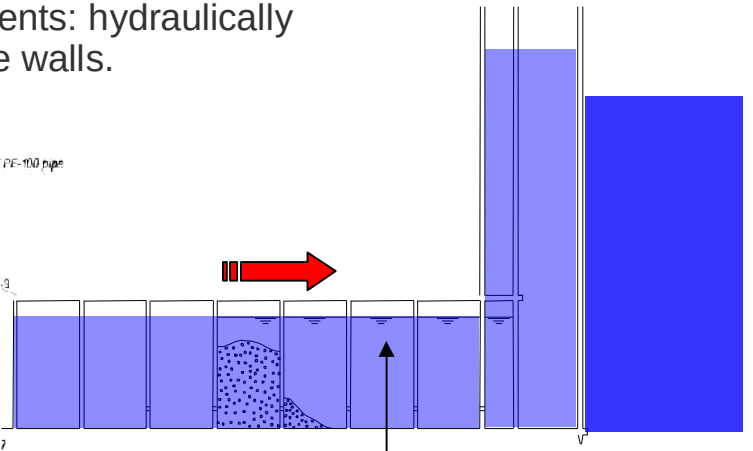
Scope FDC - Solid Ballast Installation



- **42 ballast cellar compartments and 46 ballast wing compartments** are situated underneath and next to the LNG tanks.

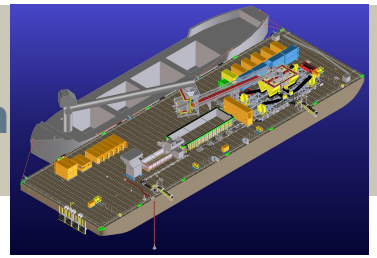
  - Installing ballast material into cellar compartments: hydraulically through **#4 5inch pipes** casted in the concrete walls.





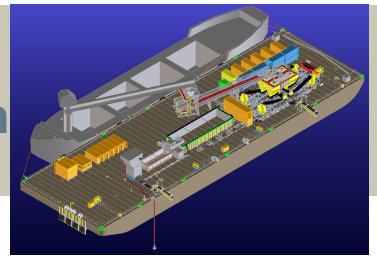
  - Installing ballast material into wing tanks: hydraulically through **opening on deck**.

Scope FDC - Solid Ballast Installation



- DN143 : 24,000tonnes barge
- Dimensions:
  - Length 135.8m
  - Width 42.0m
  - Depth 8.0m
  - Max draught 5.5m
- Has been outfitted at Antwerp Ship Repair
- Started mobilization 20/08/08

Scope FDC - Solid Ballast Installation



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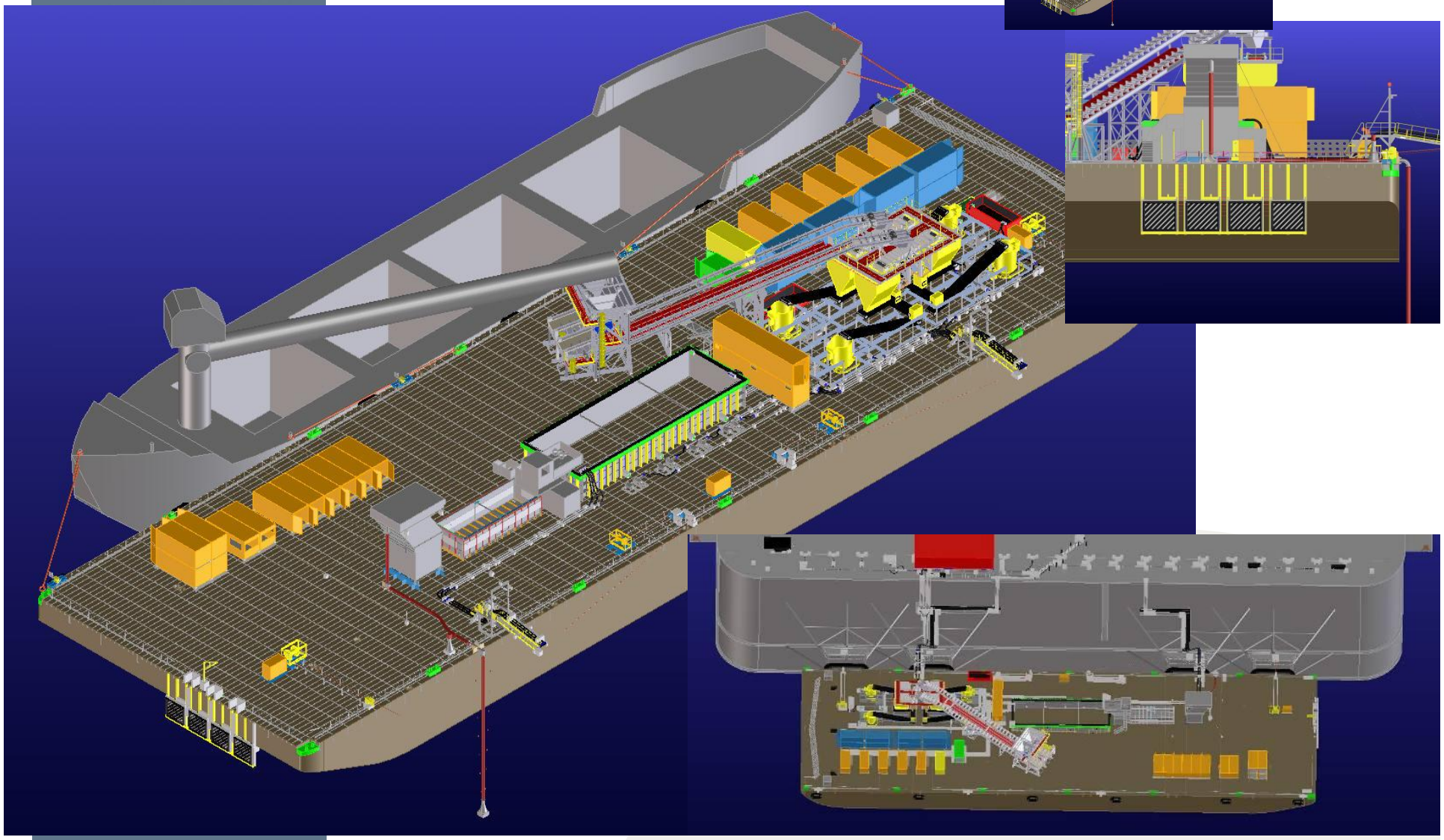

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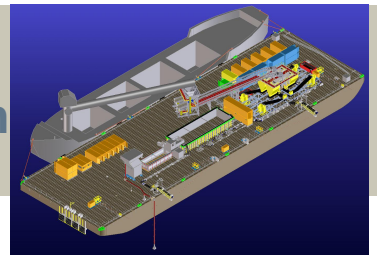
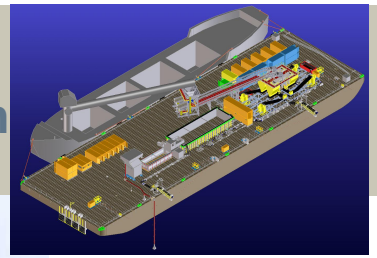
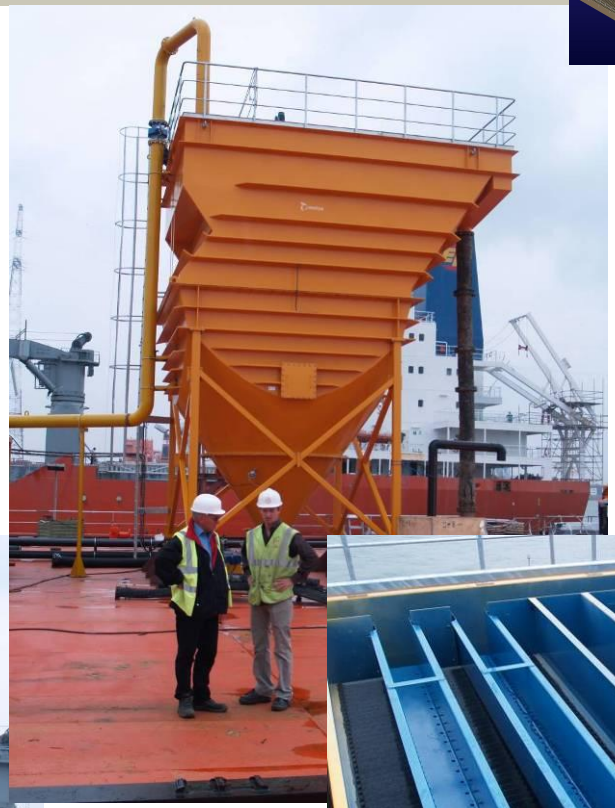


Scope FDC - Solid Ballast Installation

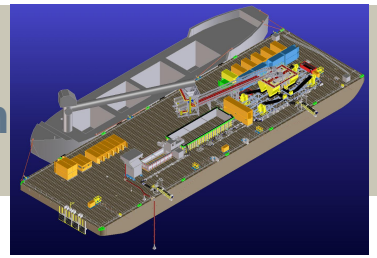


Water treatment installation

- Hydro cyclones
- Lamellae separator

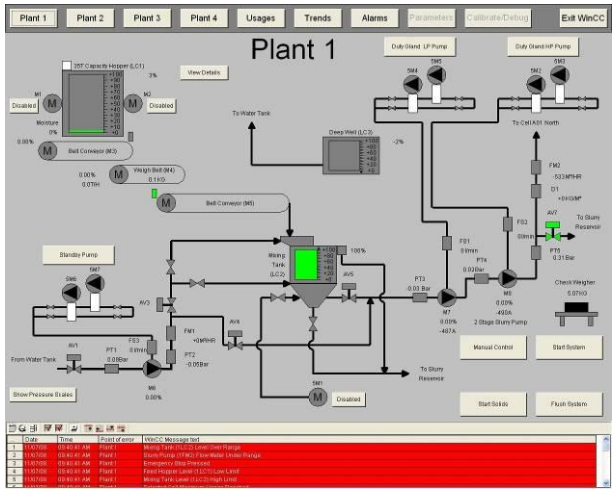


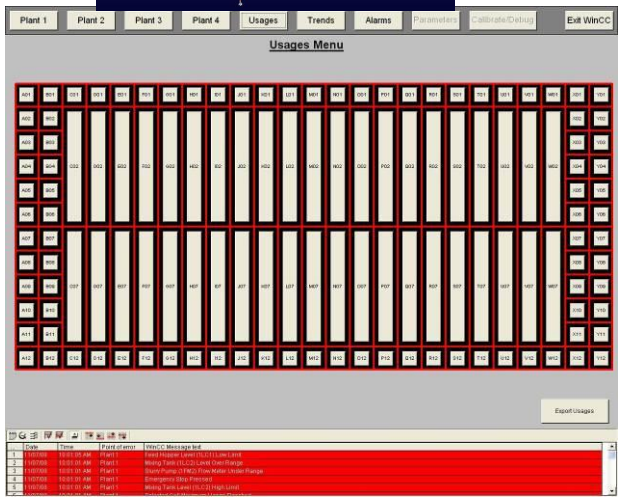
Scope FDC - Solid Ballast Installation

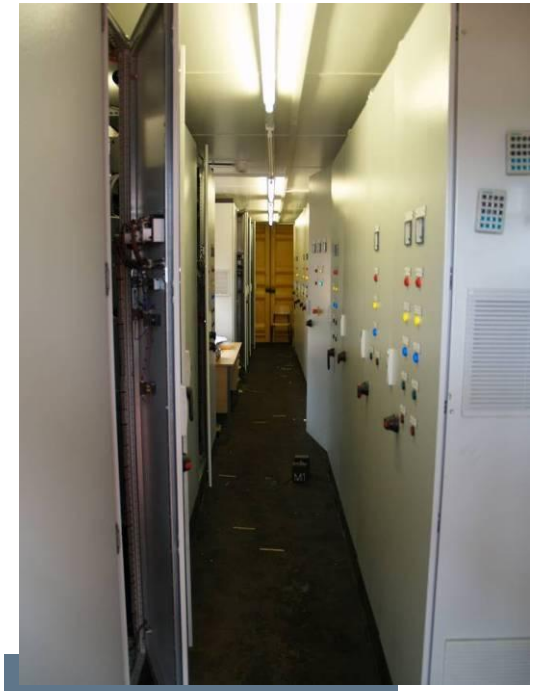


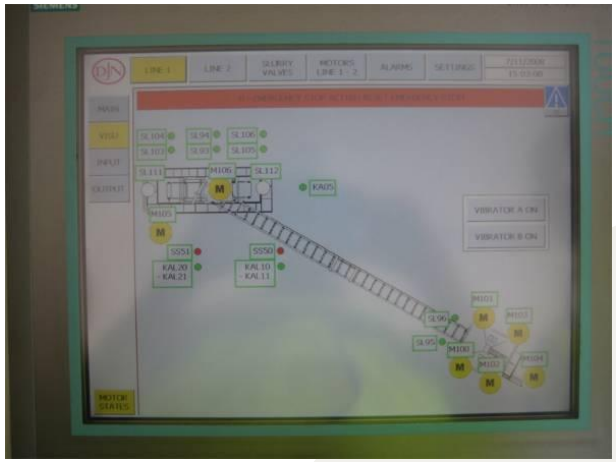
- Power supply
- 5 x 1250kVa
- 8 x 20m^3 fuel tanks

Scope FDC - Solid Ballast Installation



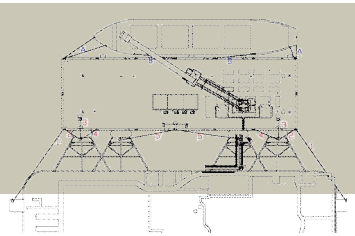






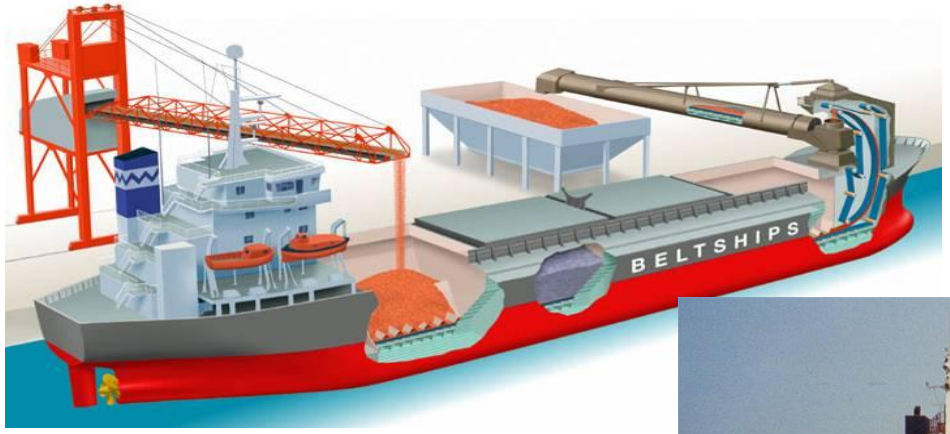
- Control room
- Mixing and Pumping Plants
- Bulk Handling Installation

Scope FDC - Solid Ballast Installation



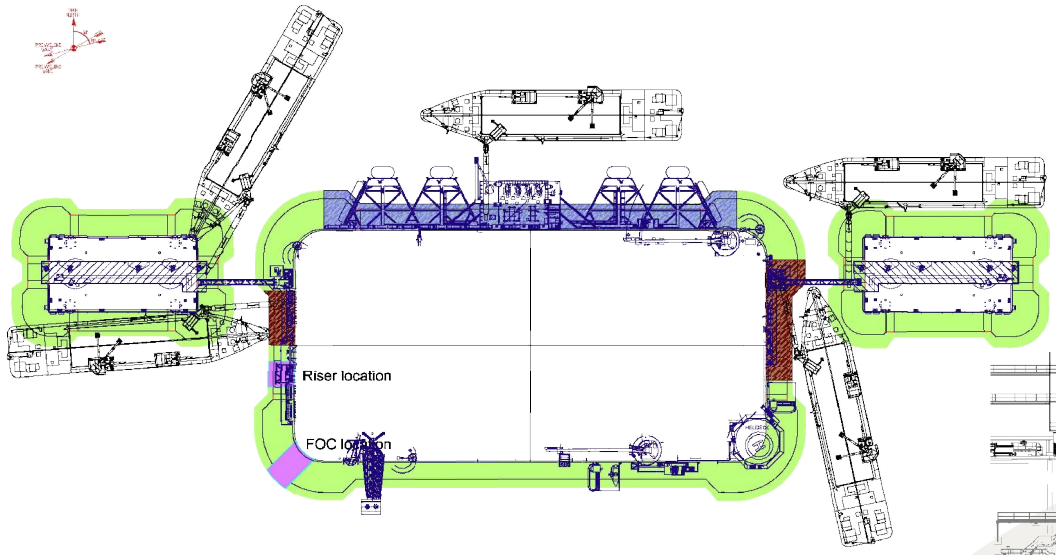
- Sand supply will be executed by Jebsen subcontracted by Mantovani

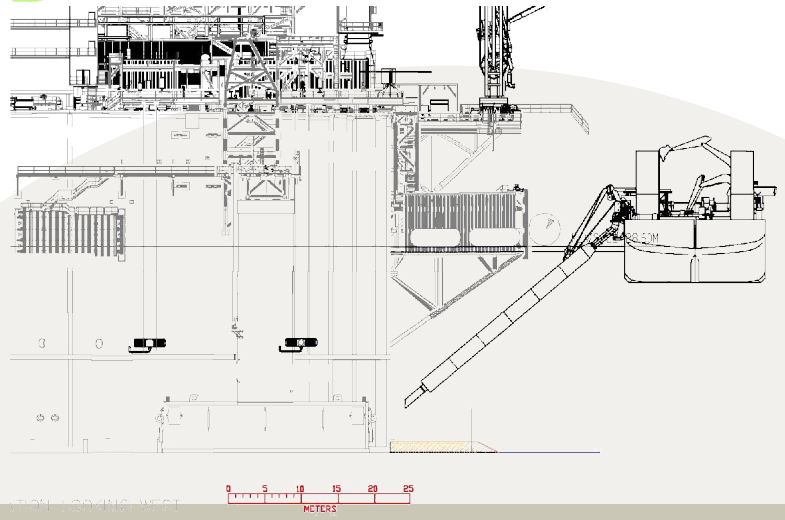
LENGTH OA	112.2	m
WIDTH OA	20.5	m
DEPTH	13.0	m
DEADWEIGHT	10,000	Tonnes
DISCHARGE RATE	800	T/hr



Scope FDC - Scour Protection Installation

- FDC will install 15,000m^3 of **scour protection material (rock)** around the perimeters of the GBS and the Mooring Dolphins with the **Inclined Fallpipe vessel La Boudeuse**
- **Using the Inclined Fallpipe** La Boudeuse will be able to install rock underneath the breasting structure.

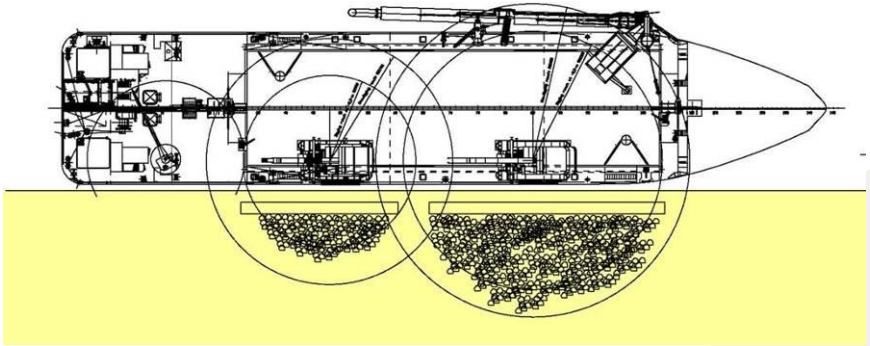


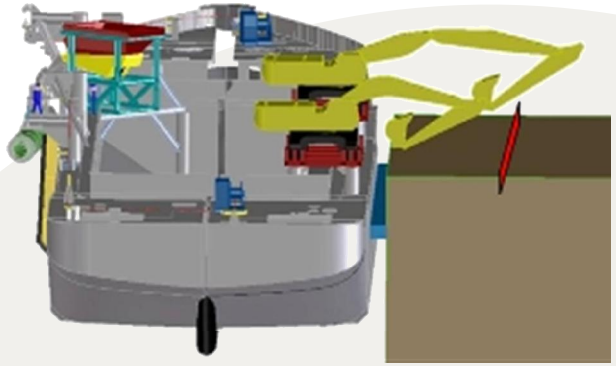


Scope FDC - Scour Protection Installation

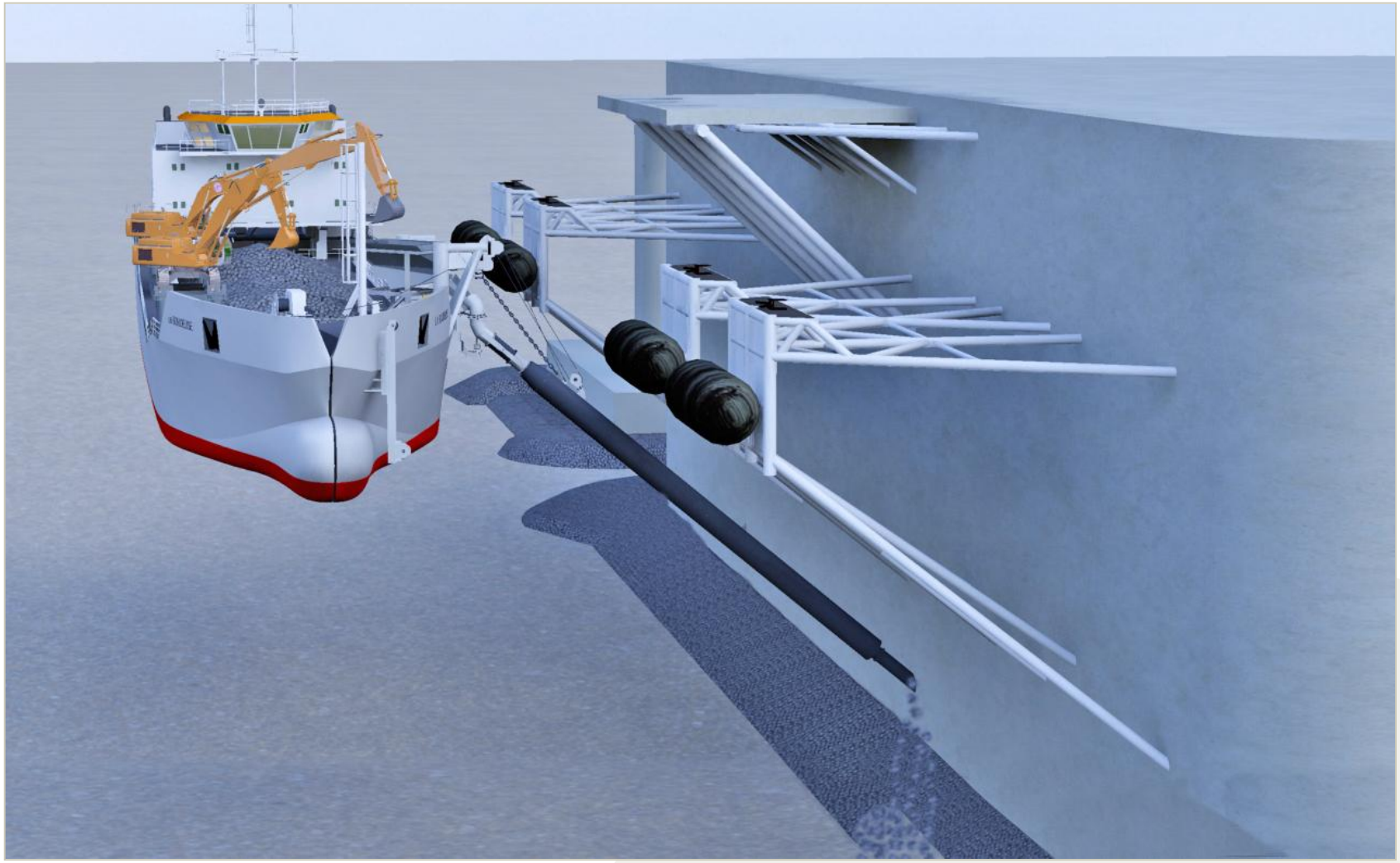
- **The scour protection material (rock)** will be produced in a Croatian quarry and transported to a quaywall near Pula.

- **The Inclined Fallpipe vessel La Boudeuse** will load this material in the hopper using its excavators mounted on its Starboard side.

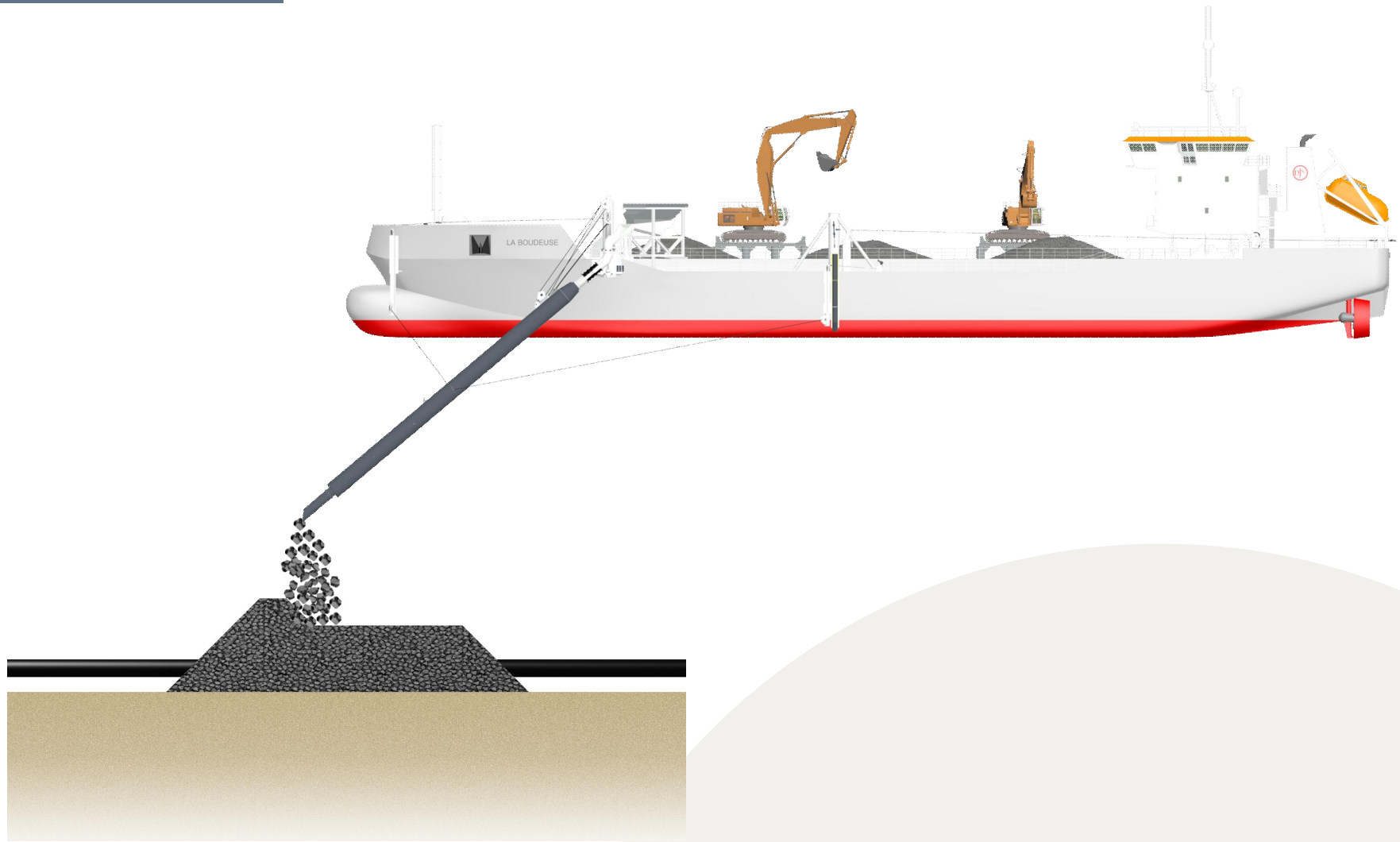


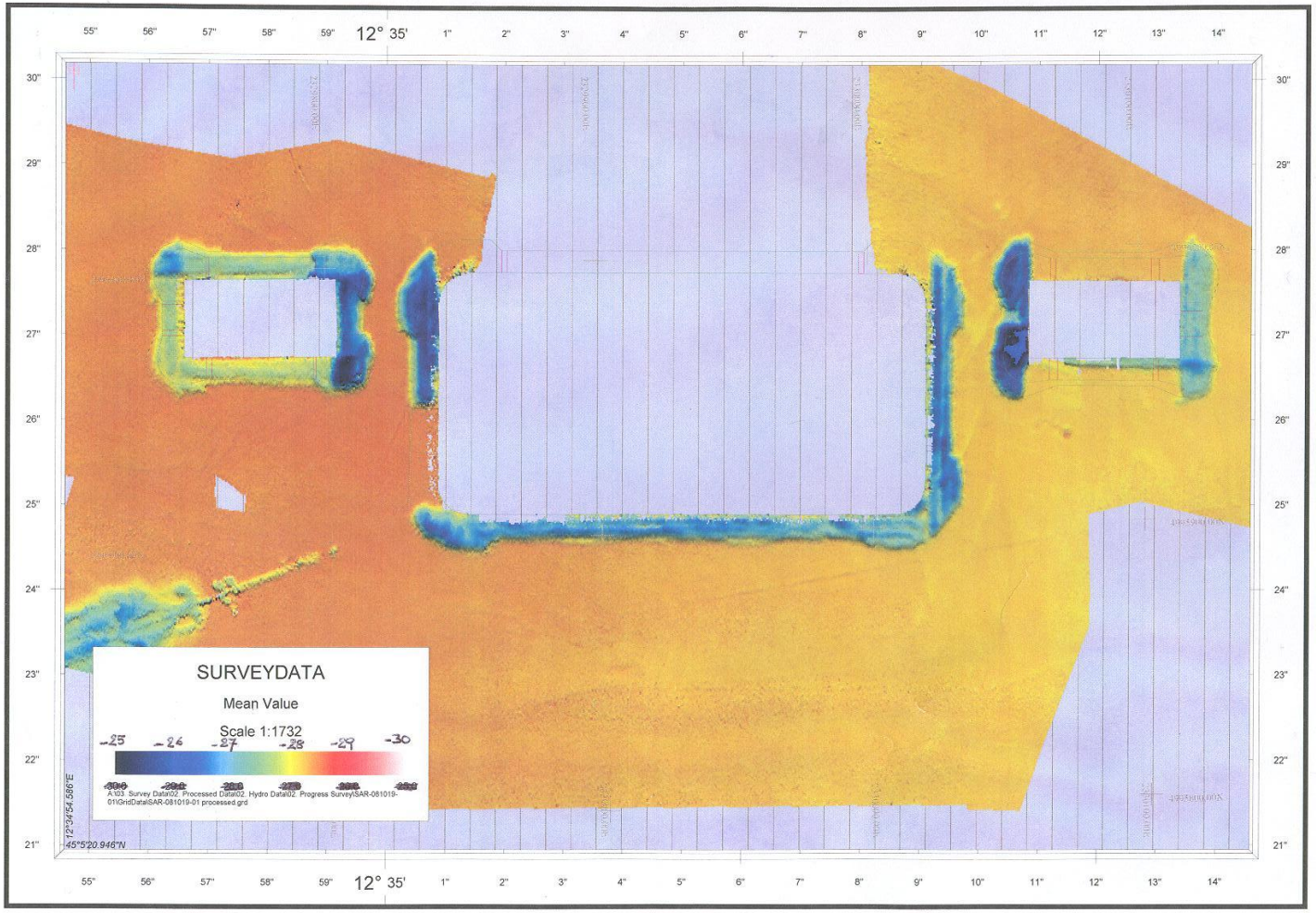


Scope FDC - Scour Protection Installation




HITACHI
LIEBHERR


LA BOUDEUSE


12° 35'
SURVEYDATA
Mean Value
Scale 1:1732
-25
-26
-27
-28
-29
-30
A:\03. Survey Data\02. Processed Data\02. Hydro Data\02. Progress Survey\SAR-081019-01\Grid\Data\SAR-081019-01 processed.grd
12°34'54.586"E
45°5'20.946"N

Questions?

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