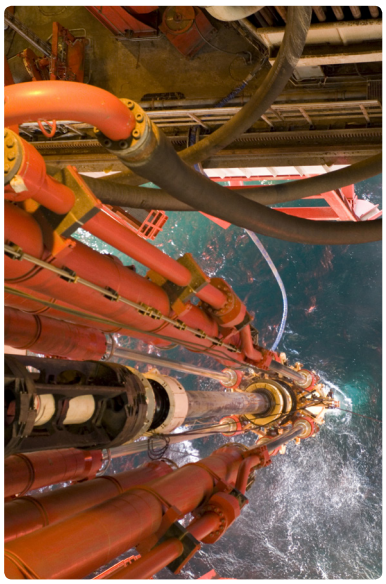
CASE STUDY

Shore-Connection LNG NOGA Terminal
National Oil & Gas Authority (Bahrain)



Applications:

Metals: Mill stands, winders, pumps, fans.

Marine: Main propulsions, thrusters, pumps and compressors, dredgers.

Oil & Gas: Drillings, pumps, compressors, blowers. Water,

Wastewater and Power Generation: Fans and pumps.

Cement, Mining and Minerals: Mine hoists, grinding mills (SAG mills, ball mills, etc.), conveyors, crushers, fans

In the second quarter of 2017, Ingeteam was awarded a contract for supplying a 7 MVA Shore Connection Power Supply 50/60 Hz Static Frequency Converter for the LNG Import Terminal located in Bahrain.

This facility will import LNG brought by LNG Carriers which will be transferred to a Floating Storage Unit (FSU) for storage. Later, LNG will be re-gasified and sent through a pipeline to the land-based gas system for further distribution

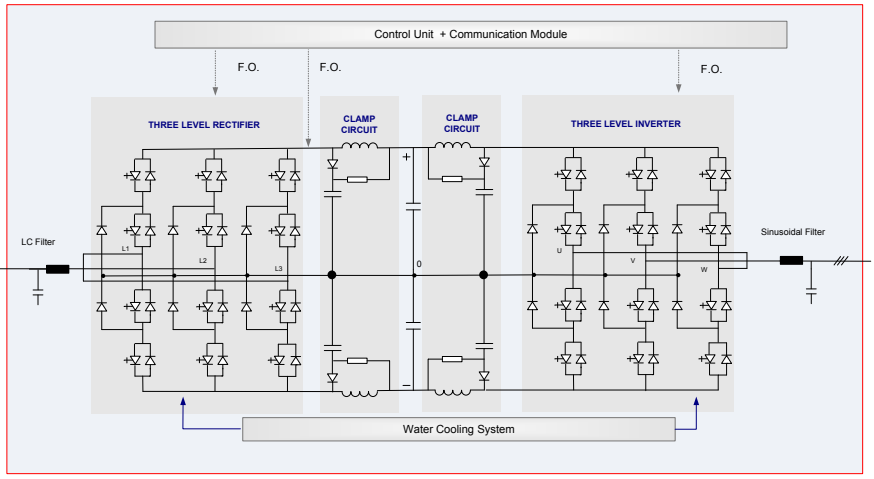
This Shore connection, which is based on Ingeteam´s in-house development called INGEDRIVE MV500 will connect the 50Hz-based Bahrain electrical grid with the LNG ship which is being used as FSU facility, which has a 60 Hz grid

Shore connection allows all diesel engines to be switched off, with the subsequent reductions in emissions and fuel savings. Noise and vibrational levels are also reduced to a minimum.

This contract shows the trust our clients place on the state-of-the-art equipment designed and manufactured by Ingeteam.

Ingeteam's solution is based on a water-cooled Ingedrive MV500 with Active Front End (AFE) rectifier, which features a 3-level NPC topology, and high power density press-pack IGCTs semiconductors.

Ingedrive MV500 delivers a power ratings between 6 MVA and 44 MVA.



www.ingeteam.com
ingedrive.info@ingeteam.com

Ingeteam

General Description

INGEDRIVE

	Scope of Supply
Supplied equipment	Project management Basic and detailed engineering Equipment supply: · Ingedrive MV500 Shore to ship 50/60 Hz Shore Converter Commissioning After sales services (360ºCRS)

	Technical Features
Converter type	**Ingedrive MV500**
Rectifier	Fully-regenerative Active Front End (AFE) type, based on HV-IGCT, 3- level NPC topology
Inverter	Totally controlled HV-IGCT bridge, 3-level NPC topology, using PWM modulation techniques based on voltage vectors
DC-Bus system	Consisting of high-capacity long-life polypropylene capacitors
Cooling method	Water cooled

	Electrical Features
Rated Output Power	7000 kVA
Input Side Voltage	3300 Vac
Input Side Frequency	50 Hz
Output Side Rated Voltage	3300 Vac
Output Side Frequency Range	60 Hz
Overload	150 % during 30 seconds every 1 min
Dimensions W/H/D	6410 mm / 2320 mm / 1260 mm

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