



## LNG PRESENTATION



DAMEN  
SHIPREPAIR  
BREST



WHO WE ARE

[WWW.DAMENSHIPREPAIR.COM](http://WWW.DAMENSHIPREPAIR.COM)

**DAMEN**



- Damen Shiprepair Brest is part of the large **Damen Shiprepair & Conversion Group**
- This is a well-established repair yard with modern facilities
- With several repair quays and 3 drydocks, the yard can accomodate the world's largest vessels
- The largest dock is 420 x 80 m, one of the biggest in Europe
- Large cranage capacity is available, and up to 150t

WHO WE ARE



- The shiprepair yard offers a broad range of services for many LNG vessels

Mark III	MOSS
Mark 1	IHI SPB
NO 96	CS1
NO 88	Q-Max Mark III
NO 85	Q-Flex Mark III
NO 82	

- Our highly skilled workforce is particularly well known for its vast LNG tanker expertise.

WHO WE ARE



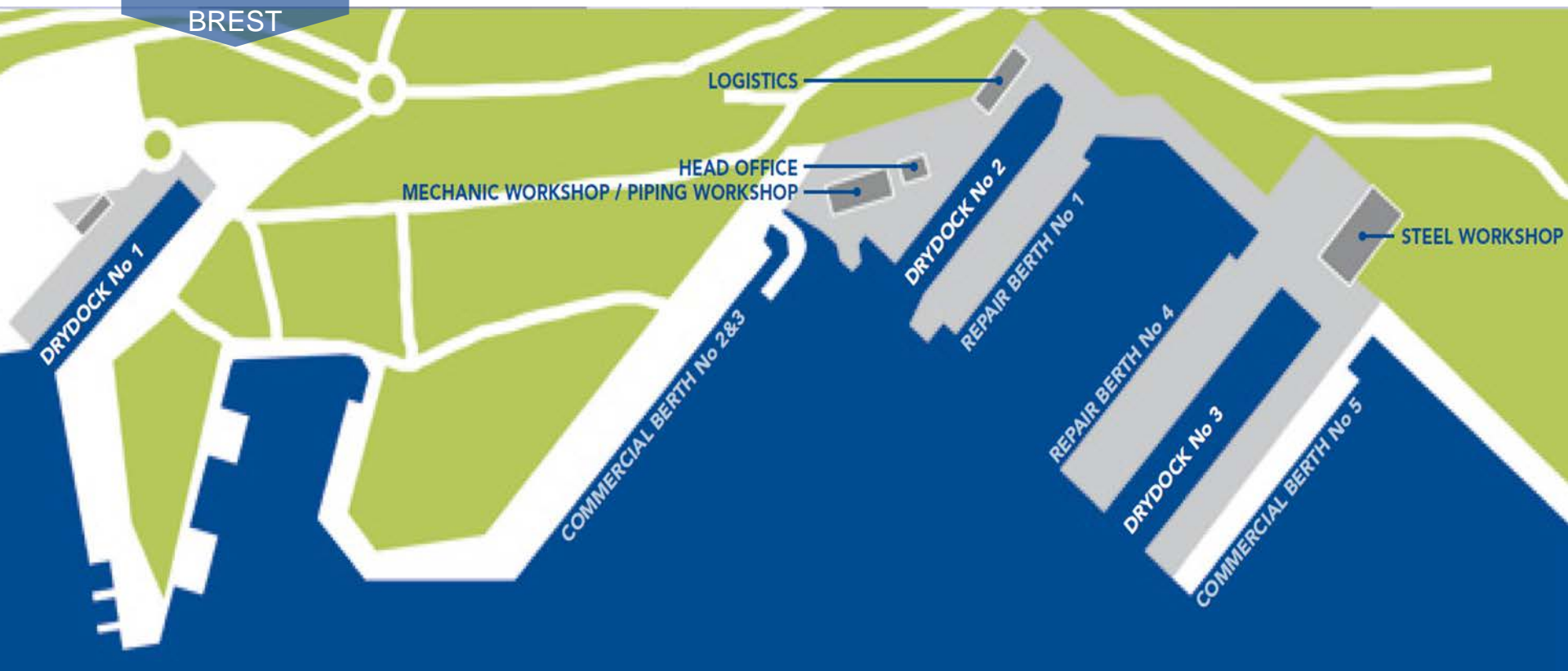


## DAMEN SHIPREPAIR BREST

- One of the biggest docks in Europe (420x80m), shore crane, tunnel access
  - Shipyard size and adjacent port terminal facilities
  - Specialized LNG services (GTT license)
  - Deep water quay side possibilities
- 
- Employees: 172
  - ISO certificates: ISO 9001 : 2015







WHERE WE ARE



## DOCKS AND QUAYSIDES

	BERTH 1	BERTH 4	DOCK 1	DOCK 2	DOCK 3
Length o.a. (m)			225,0	338,0	420,0
Breadth (m)			27,0	53,0	80,0
Draft (m)	10,0	10,0	7,3	10,3	10,3
Number of cranes	3	4	1	4	4
Crane capacities (mt)	90	150	30	90	150



GRAVING  
DOCKS: 3



> 700 m  
BERTHS



- Shore power up to 800A – 440V – 60HRZ.
- Fire main up to 8 bars.
- Compressed air up to 7 bars.
- Fresh water / potable up to 5 bars.
- Ballast line up to 2,500m<sup>3</sup>/h.
- Cooling water line in Drydock No.3 up to 800 m<sup>3</sup>/h.
- Generator sets up to 2100 KVA .

## UTILITIES



Well equipped machine workshops of 5,500 m<sup>2</sup>, 50 machine tools, Gantry cranes up to 60t, balancing machine, etc...



## MECHANICAL WORKSHOP



- A 8,000 m<sup>2</sup>, steel workshop
  - Gantry cranes up to 40t
  - Module prefabrication up to 150t
  - Cutting benches, roller-presses
  - Welding machines, MIG, TIG, etc...



## STEEL WORKSHOP

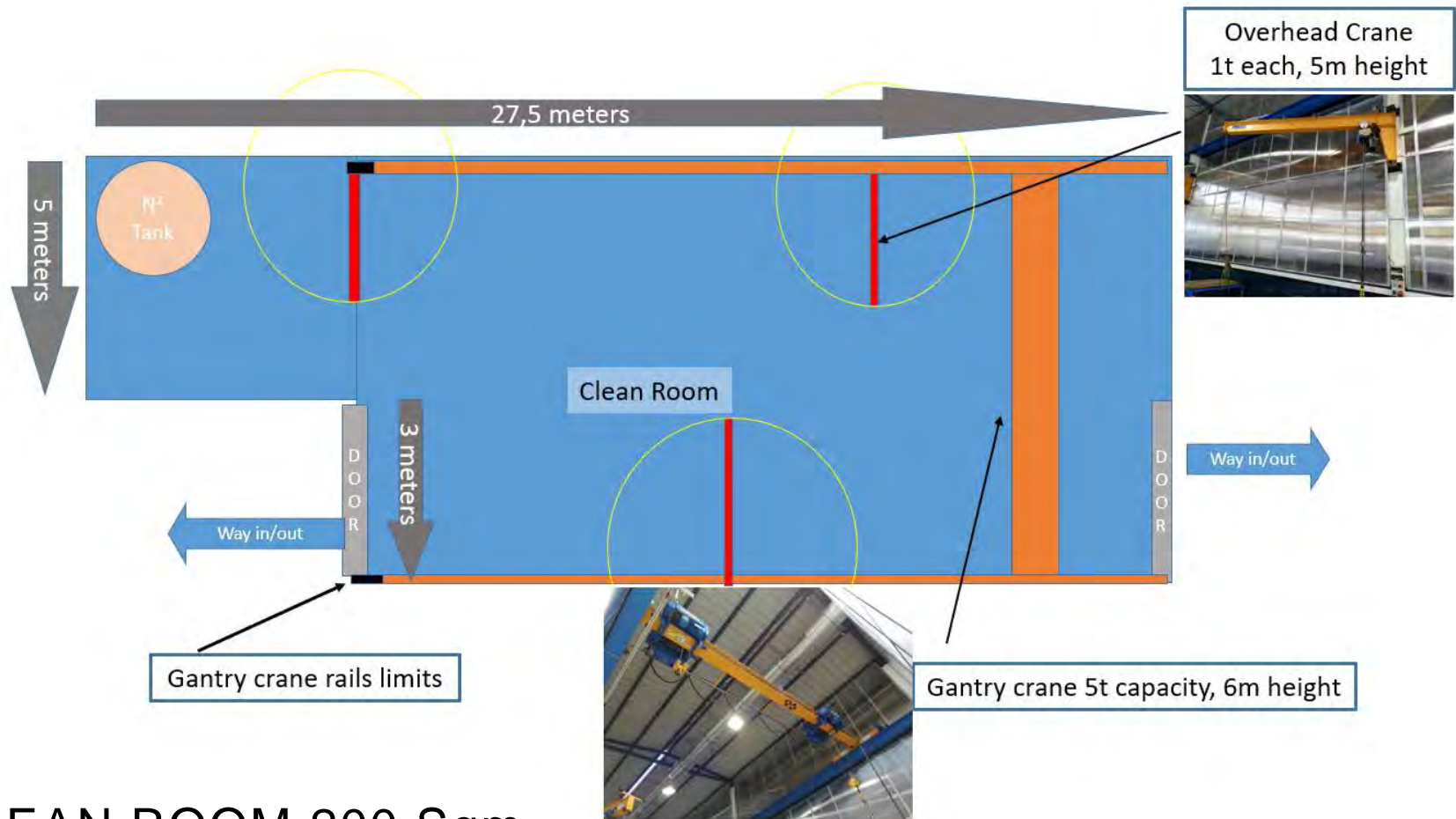


- Piping prefabrication capacity up to 1,200mm diameter.
  - Certified Welders & NDT operators
  - Hydraulic pickling and flushing plant
  - High pressure testing of piping systems
  - Boiler works
  - Own piping technicians to provide customers advanced of prefabrication drawings



## PIPING WORKSHOP





CLEAN ROOM 200 Sqm



LARGE  
ENTRANCE

DOOR

3 X 3 M



Nitrogen tank for safety valve  
pressure tests



Electric power

- Up to 200 A single-phase current
- Up to 200 A three-phase current



Compressed air power

- Up to 100 m<sup>3</sup>/h at 7 bar



6 fully equipped large workbenches  
3 x 1m



CLEAN ROOM



- Tank opening procedures
- Tank cleaning procedures
- Tank inspection procedures
- Tank closing procedures
- Material certificates
- End documentation of all works executed and signed off.



## QUALITY CONTROL



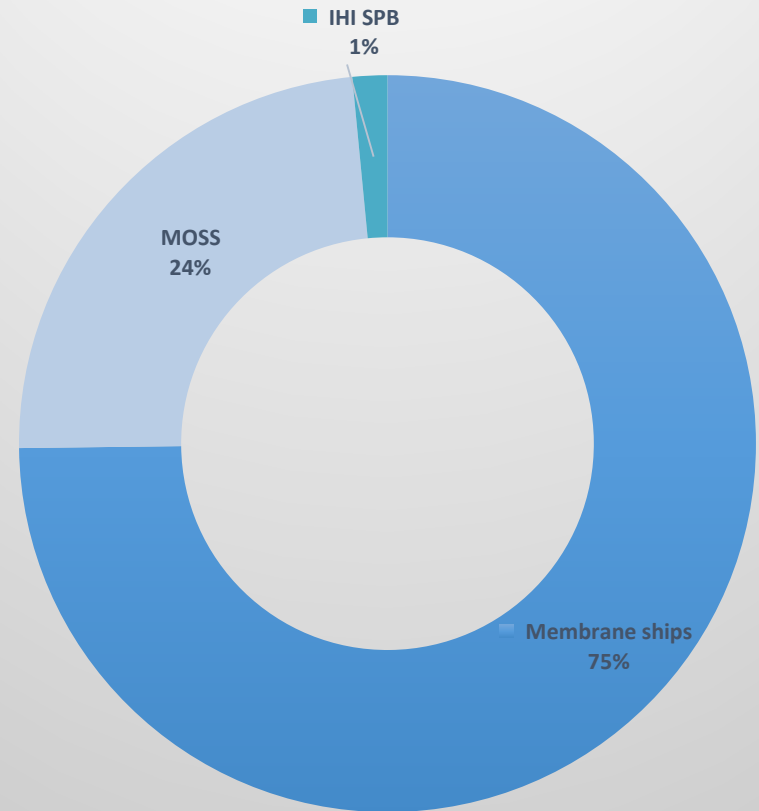
SEVILLA KNUT

- Subcontracting company
- Painting towers installed in the dock ensure fast hull treatment work.
- Large-blasting pressure vessels and robot controlled blasters for efficient and fast painting.
- UHP possibilities
- Airless spray equipment also used for silicon paint work.
- New, covered, booth blasting for prefabricated new/ repair parts or vessel equipment (mushrooms, winches, etc )



## HULL TREATMENT





132 LNG Tankers have docked at DSBr



DAMEN  
SHIPREPAIR  
BREST



REFERENCE LIST





GAZTRANSPORT & TECHNIGAZ S.A.

**CERTIFICATE for REPAIRS & MAINTENANCE on  
Membrane LNG carriers**

This certificate is issued to:	<b>DAMEN SHIPREPAIR BREST</b>
Date of Agreement:	<b>Effective since 01<sup>st</sup> October, 2013</b>
Scope of Agreement:	<b>Repairs &amp; Maintenance of Membrane Type Cargo Containment and Cargo Handling Systems</b>
Term of Validity:	<b>September 30<sup>th</sup> 2021 with automatic renewal and possible termination with 3 months notice</b>

This is to confirm that GTT has entered into a Technical Services Agreement (TSA) with DAMEN for repair and maintenance work in Membrane type cargo tanks of LNG carriers.

Done in Saint Rémy Lès Chevreuse  
On September 17<sup>th</sup>, 2020

Certified by:  
Rémy DIRLES  
In-service Manager, Operations

Gaztransport & Technigaz S.A.

**GTT (Gaztransport & Technigaz) SA**  
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Tel. : +33 (0)1 30 23 47 89 - Fax : +33 (0)1 30 23 47 00



DAMEN  
SHIPREPAIR  
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DAMEN SHIPREPAIR BREST MAJOR REPAIRS ON LNG VESSELS

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**DAMEN**





- Development (workshop tests, procedures, agreements) and carrying out controls & repairs of cracks in inner hull (against insulation of tanks)
- Repair of large areas of tank cargo insulation (primary & secondary membrane)



- Integration of new generator room and complete renewal of cargo manifold
- Main and auxiliary condenser full re-tubing, main boilers FW retubing
- Chair repairs on all cargo tanks
- Leak repairs on secondary barrier on a CS1 type





- Deck piping protection
  - Tank entrance protection
  - Tank entry monitoring
  - Tank floor protection
- Global tests
  - Tank atmosphere
  - Tank staging



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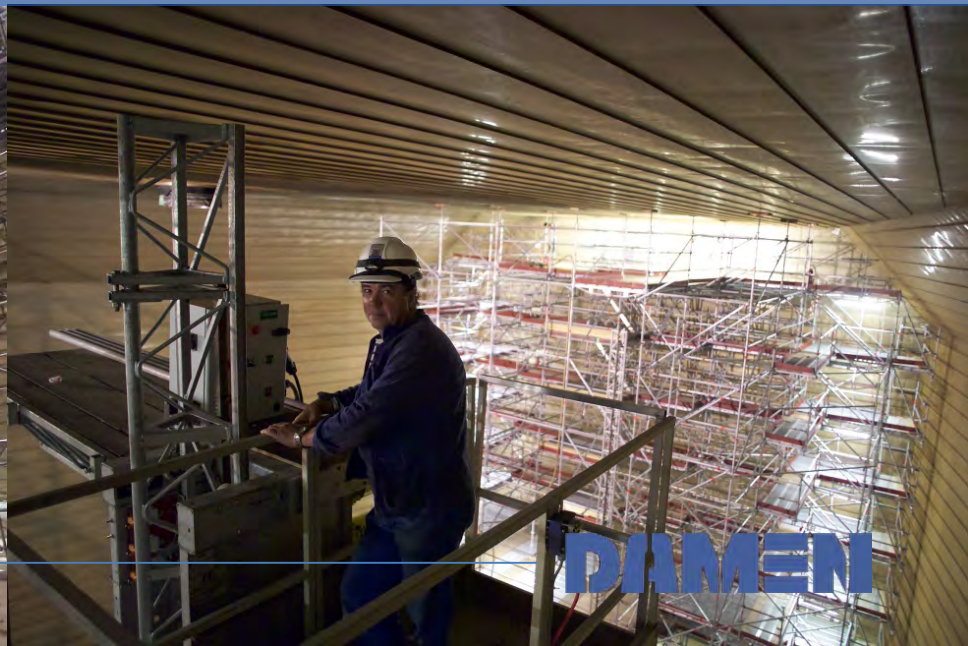
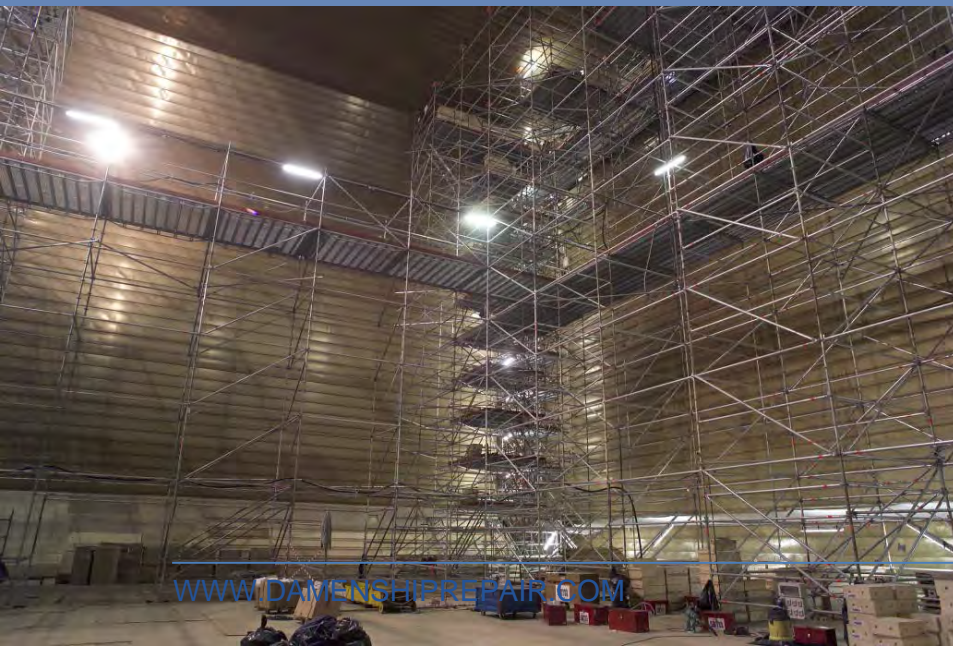


## CARGO CONTAINMENT Cargo Pump Overhaul





## FULL OR PARTIAL STAGING







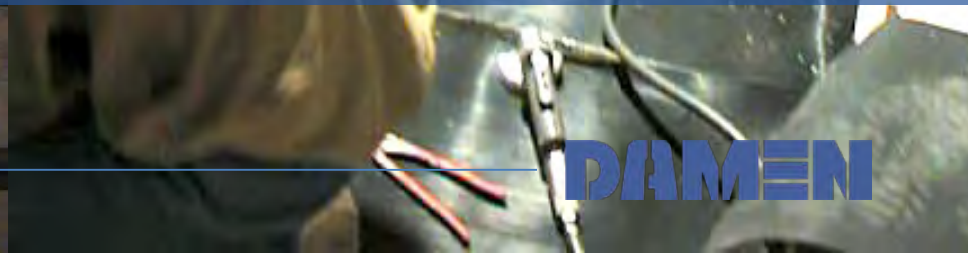
SPECIAL TOOLS FOR TRANSPORT THE MATERIAL INTO TANKS



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## MEMBRANE REPAIR WORKS in LNG CARGO TANKS



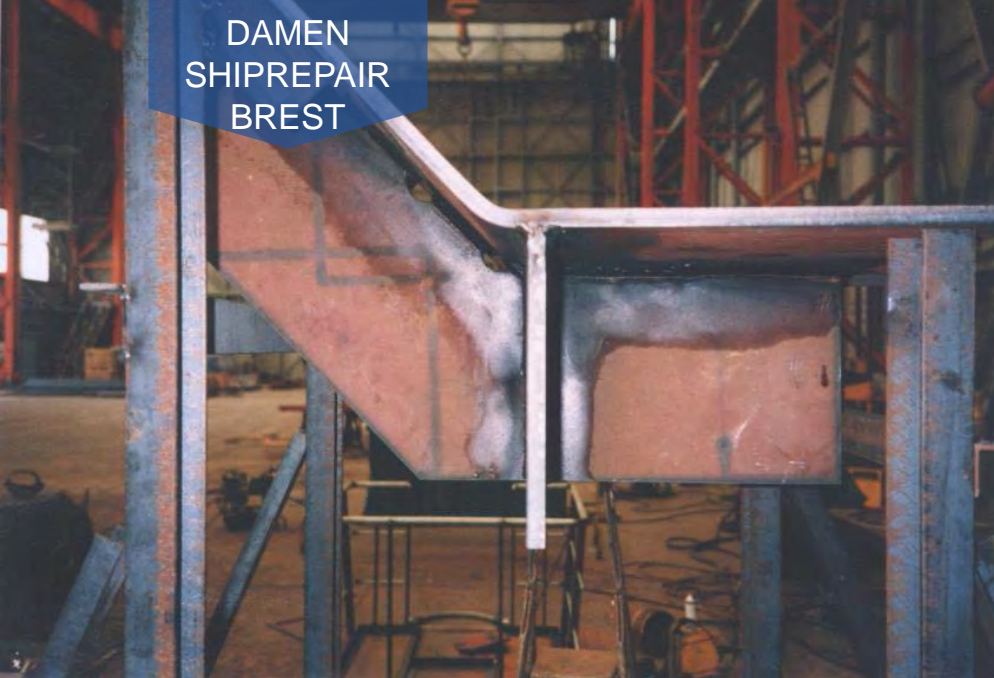


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## MEMBRANE REPAIR WORKS





TESTING TEMPLATE



A large industrial LP turbine is mounted on a blue balancing machine in a workshop. A worker in a blue uniform stands next to the machine, pointing at the turbine. The turbine has multiple rows of blades. The workshop has a tiled floor and various tools and equipment in the background.

## LP TURBINE ON THE BALANCING MACHINE





TANK INERTING UP ON COMPLETION OF REPAIRS





- Flow of nitrogen 5000 m<sup>3</sup> per hour
- Total operation duration: 3 days 24/7





- Permanent monitoring in close contact with ship's Cargo Engineer
- Operation accomplished with vessel in dock to save ship movement.



*POLAR SPIRIT*

## DAMEN SHIPREPAIR BREST STRENGTHS

- More than 30 years of experience in repairing LNG Vessels
- Skilled people
- Good yard location
- Wide range of customers
- Excellent yard facilities for all works and logistics
- Good network of specialists LNG related
- Cryogenic workshop
- N2 supplying opportunity

*SONANGOL SAMBIZANGA*





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THANK YOU FOR SAILING ALONG !