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TRACK RECORD

ROONBORG

MAY 2022

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1 INTRODUCTION

Barge Master is dedicated to improving offshore workability. We provide motion compensation systems that help our clients to avoid weather downtime and remain in charge of their operations and schedules.

The Barge Master **Platform** can be installed on any vessel to serve as a working base for any kind of equipment, enabling secure operations in uneven waters.

The Next Generation **Gangway** provides continuous access for people and cargo, ensuring safe transfers to any offshore structure.

The Barge Master **Crane** enables controlled lifting operations in high sea states, making it possible to work at sea almost year-round.

Barge Master systems are developed in close cooperation with selected technology partners, such as Bosch Rexroth and our sister company Temporary Works Design (TWD). This cooperation allows us to ensure the highest quality in motion compensation systems.

Our products are designed to help you deliver your project safely, on time and cost-effectively.

3D MOTION COMPENSATED PLATFORM BM-T700

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2 MOTION COMPENSATED PLATFORM – BM-T700

The Barge Master Platform (BM-T700) can be installed on any vessel to serve as a motion compensated working base. Equipment such as cranes, excavators and drilling configurations can be placed on the platform to eliminate the effect of vessel motions, making it possible to operate the machinery with the same precision as onshore.

By compensating the motions of your vessel, the platform effectively turns your deck space into a perfectly stable working area. As a result the operations can continue even in adverse weather, enabling you to stay on top of the execution and timeframe.

Track Record:

- 2013 700 mT load test Crawler crane lifting operation 100 mT supply operation
- 2015 2016 Malampaya bridge installation
- 2016 2017 Drill operation
- 2017 Uxo removal
- 2019 Drill operation

Systems:

- 2013 Build of the first BM-T700 (available in Singapore)
- 2016 Build of the second BM-T700 (available in Rotterdam)





2.1 Compensating a 700mT load

The goal of this operation was to demonstrate the maximum payload capacity of the BM-T700, certify the BM-T700 and demonstrate the continuous performance of the system even for the highest loads. The operations were conducted in one day at the North Sea. In total the motions of the load were compensated in 16 runs with an average of 20 minutes per run. During the operations various conditions were encountered.



2.2 Crawler crane operations

Several crawler crane operations were conducted in two days with the BM-T700 during 41 runs with an average of 12 minutes. A Liebherr LR1250 crawler crane was placed and seafastened on the platform. The crane radius, cable length and slewing angles were varied over its full range.

Various loads have been lifted by the crane, figure 2 shows the crane lifting a 20ft container filled with water and slewing towards the aft of the barge.

The on-board lifting functionality allowed the BM-T700 to compensate for the relative motions between the load and a certain location on the deck. This means that roll and pitch are fully compensated, while the vertical motion between the selected barge location and load is compensated. The crane itself will have some vertical motion, depending on the selected location. The on-board lifting functionality increases the workability and safety; loads can gently be picked and placed of the barge without any damage of equipment.



2.3 Supply operation of a 100mT load

A supply operation was conducted with the Jack-Up Barge Goliath of GeoSea. A barge with Barge Master and a 100mT load was moored at Thorntonbank, Belgium.

The motion compensated supply barge was moored next to the Jack-Up Barge, subsequently the BM-T700 was set into compensation mode. With the load compensated, the riggers could safely and in a controlled manner connect the 100mT load to the crane hook. The crane then gently lifted the load from the BM-T700 and subsequently placed it back. The Barge Master system ensured that only very minimal motions were left between the crane hook and the supply load thereby significantly increasing the safety and workability of this operation. The vertical accelerations of the 100mT test load remained below 1.5 m/s².





2.4 Piping bridge installation for Malampaya gas field

For a safe and controlled lifting operation of a 300mT piping bridge between a gas platform and a depletion compression platform of Shell Philippines Exploration B.V., Boskalis used the BM-T700 in their Malampaya project in the first half of 2015. Positioned at the aft of their multipurpose vessel Ndeavor, the BM-T700 compensated for the sea induced motions, enabling the connection of the lifting arrangement from the platforms to the piping bridge.

The Barge Master kept the piping bridge steady which enabled gently lifting of the piping bridge, with minimal shut down period of the Malampaya gas field. Installation without the Barge Master at this location would be extremely difficult and uncertain due to wave conditions and seabed conditions.







2.5 Motion compensated drilling for offshore wind project

In the second half of 2016 a project started for offshore wind farm installation. Together with a crawler crane a drilling unit is installed on the BM-T700. Using this setup holes are drilled into the seabed at approx. 40m water depth, for the installation of foundation piles. The soil conditions at the project location don't allow the use of a jack-up barge. Precision drilling from a floating barge would not have been possible without motion compensation.

The crawler crane is used to lift the 70 mT drill into position. Using the onboard lifting mode the crane then continuously feeds drill string. Once the drill is lowered into the foundation pile drilling starts. This operation can take up to 70 hours, where the BM-T700 is compensating the vessel motions continuously.



2.6 Motion Compensated subsea Survey & Excavation

In the first half of 2017 the 3D motion compensated platform BM-T700 was used for subsea excavation in the North Sea by Belgium. The platform was equipped with an excavator also containing subsea survey sensors. Because a quick start was needed all the engineering and the mobilization was done in two and a half weeks.

For the operation it was crucial that the excavator was held completely still in the swell and wave heights of the North Sea.



2.7 Motion Compensated drilling for Buoy installation

In Q1 & Q2 of 2019 Barge Master was contracted by Large Diameter Drilling (LDD) for a drilling job in the Caribbean, for SBM Offshore. Together they have installed the foundations for a CALM Buoy, for the Limetree Bay Terminal.

Difficult seabed conditions and water depths up to 270 m. made conventional methods not possible, therefore an inventive solution was needed, based on the proven technology of Barge Masters' motion compensated platform the BM-T700.

The platform was equipped with LDD's drill rig, for safe motion compensated drilling of the anchor foundations.

3D MOTION COMPENSATED CRANE BM-T40

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3 MOTION COMPENSATED CRANE – BM-T40

The Barge Master Motion Compensated Crane enables controlled lifting operations with a high crane capacity, making it possible to work at sea almost year-round. It has proven to increase workability in the North Sea from 180 to 330 days.

The Barge Master Crane is designed for maintenance support vessels and platform supply vessels. It ensures safe lifting operations for all headings in higher sea states. The motion is compensated at the basis of the crane, ensuring a steady operator cabin as well as a steady load.

The crane features a small footprint and is able to lift 32 metres above sea level at a reach of up to 20 metres or 15 tonnes at a reach of 10 metres. In addition to its lifting capacity, the crane is also manriding certified for safe personnel transfer.

Track Record:

2015 - current
 Servicing Shell/NAM platforms at the North Sea

Systems:

- 2014 2015 Installation of first BM-T40 on Wagenborg's the 'Kroonborg'
- 2017 2018 Build of the second system for Wagenborg's 'Kasteelborg'





3.1 Servicing Shell/NAM platforms at the North Sea

The Barge Master Crane is installed on the famous first walk-to-work vessel the Kroonborg. It was the first vessel where multiple functions where combined for the first time, to service the Shell/NAM platforms.

Offshore platforms have become smaller and more flexible during the last forty years. They no longer have a resident crew or helicopter pads which means frequent journeys to and from the platform by vessel in order to perform maintenance work. With this vessel these operations can be executed in a safer, more efficient and effective manner.

The motion compensated crane on the Kroonborg has increased the workability from approximately 180 to 330 days per year, even in the North Sea's famously rough conditions.

Winner OTC Houston 2016





3.2 Second system for walk-to-work vessel Shell/NAM

Wagenborg has awarded Barge Master with an additional contract for a 3D motion compensated crane, the BM-T40. The second motion compensated crane is installed on the 'Kroonborg' vessel. The new Walk-to-Work vessel will also support offshore operations for the combined NAM and Shell UK business unit at the gas production facilities in the Southern North Sea. It will operate as a stand-by and support vessel for inspection and maintenance of the unmanned platforms in both Dutch and British waters

MOTION COMPENSATED GANGWAY

ARGE MASTER Rexroth Bosch Group

MOTION COMPENSATED GANGWAY 4

Barge Master's fully motion compensated Next Generation Gangway provides continuous access to any offshore structure. This motion compensated gangway ensures safe and efficient transfer of crew irrespective of weather conditions.

The system provides horizontal gangway access for people and trolleys up to 800 kg., with a lifting capacity of 2.000 kg. Making the system truly unique are its distinctive reliability features, designed especially to guarantee uptime. These features safeguard the workability of the gangway to the highest degree, a single failure will never lead to any loss in compensation.

The gangway can be fitted on a height adjustable pedestal with integrated elevator, making it possible to land on any height and maintain a continuous horizontal workflow.

The Barge Master Gangway is developed in close collaboration with our partner Bosch Rexroth, the drive and control company. Therefore it is of the highest standard, combining Barge Masters's motion compensation knowledge with the drive and control knowledge of Bosch Rexroth. Next to that it ensures global service coverage. The gangway is DNV-GL certified.

Track Record:

- 2017 2018
- In use for MHI Vestas for the Walney Extension at the Irish Sea 2018 - 2019 In use for MHI Vestas at Borkum Riffgrund II at the North Sea
- Spring 2019

2019 - 2020

2019

2019

In use for Total E&P Nederland B.V. for maintenance campaign In use for MHI Vestas at Burbo Bank and Walney at the Irish Sea Rental system on Bokalift 1 for Viking Vulcan and L10 project Rental system on Boka da Vinci for Viking Vulcan project

2019 - 2020 Rental system on Seaway Strashnov for Triton Knoll project Winter 2020/2021 Rental system on Boka Nicobar for floating wind farm installation

Systems:

- 2017 Gangway with Height adjustable pedestal with integrated elevator for Vroon's 'VOS Start
- 2018 2019 Build of second and third system for the rental market
- Dec. 2020 Start construction fourth system for the rental market





4.1 In operation at Walney Extension

This first charter, which commenced in August 2017, involved offshore logistics support, accommodation and walk-to-work services during the first commissioning phase of the Walney Extension Offshore Wind Farm in the Irish Sea.

The Walney Extension Offshore Wind Farm has been built in two phases using turbine technology from two different manufacturers – MHI Vestas and Siemens Gamesa. Vroon was commissioned for the project by MHI Vestas. Once fully complete, later this year, Walney Extension will become the world's largest offshore wind farm.

Throughout the first phase of the project, VOS Start's Barge Master Motion Compensated Gangway provided improved access to the wind turbines. Over nine months, VOS Start facilitated more than 10,000 safe transfers of personnel and trolleys. Considering its first-time deployment, the Barge Master Gangway handled transfers very well, making use of its height-adjustable pedestal, built-in elevator and unique safety features.

As Niek Spiljard, Managing Director of Vroon Offshore Services Den Helder says, "The innovative Barge Master Gangway, integrated with our advanced walk-to-work vessel design, offers an exceptional service level to clients. The step-less transfers are very much in line with the latest walk-to-work market philosophy."



4.2 In operation at Borkum Riffgrund II

The performance by both vessel and crew has resulted in the award of a subsequent contract. From May 2018, VOS Start has been supporting the commissioning phase of the Borkum Riffgrund II Offshore Wind Farm.

"The ship with its gangway system enabled us progressing with operations, during shorter weather windows and in rougher weather conditions" Laurens van Pijkeren, Project Manager at MHI Vestas Offshore Wind states. "The award of a second contract underlines the good relationship between Vroon and MHI Vestas Offshore Wind and is recognition of the service quality delivered by VOS Start and her crew during the commissioning phase at the Walney Extension Offshore Wind Farm."



4.3 Maintenance campaign for Total E&P Nederland B.V.

In the first quarter of 2019 the VOS Start was chartered by E&P Nederland B.V. to deliver offshore logistics support to a planned maintenance campaign on Total's offshore assets in the Dutch sector of the Southern North Sea.

During the first seven days of operation, the Barge Master gangway completed 34 gangway connections, transferring a total of 185 people.



4.4 Rental gangway on Bokalift 1

Barge Master has delivered two rental motion compensated gangways to Boskalis for their Viking & Vulcan decommissioning project, which started in June 2019.

The gangways are mounted on a fixed pedestal with continuous staircase access via modular units. The systems are installed on the Bokalift I and the Boka da Vinci dive support vessel.

For the Viking & Vulcan decommissioning project Boskalis needs gangway access to the oil and gas platforms at different heights, performing different operations.



4.5 Rental gangway on Boka da Vinci

Barge Master has delivered two rental motion compensated gangways to Boskalis for their Viking & Vulcan decommissioning project, which started in June 2019.

The gangways are mounted on a fixed pedestal with continuous staircase access via modular units. The systems are installed on the Bokalift I and the Boka da Vinci dive support vessel.

For the Viking & Vulcan decommissioning project Boskalis needs gangway access to the oil and gas platforms at different heights, performing different operations.





4.6 Rental gangway in use on Heavy Load Carrier

In December 2019 a Barge Master rental gangway was installed onboard the Heavy Load Carrier Seaway Strashnov.

For this project the gangway was further equipped with a lifting winch up to 1.000 kg. and a gangway 'tip ladder'. The tip ladder allows for landing over an existing structure and adds an additional 2 m. to the operational range.



4.7 Rental system on Boka Nicobar

In the winter of 2020/2021 the Barge Master gangway was mobilized on the anchor hander Boka Nicobar, from Boskalis.

The gangway was used for the installation of a floating windpark, which made it the first opportunity to use the floating to floating landing possibility. Furthermore the gangway was equipped with a 1.000 kg lifting winch, making the system fit for purpose.

APPENDIX A: CERTIFICATION BM-T700

		Certificate no:	RET0236136/1C
Lloyd's Register _{Ce}	ertificate	Page 1 of 1	
Project:	Barge Master C400		
Client:	Barge Master bv Karel Doormanweg 9d 3115JD Schiedam	Offs	e: Rotterdam
Clients Order Number:	BM-01	Da	te: 04.10.2013
		Order Stat	5: Complete
Inspection Dates First:	13.04.2011	Fir	at 17.02.2013
References - Lloyd's Register R	<u>1 (ONE) BARGE MASTER UNIT - C40</u> tules for Lifting Appliances in a Marin	e Environment, August 2009	
References - Lloyd's Register R - DNV 2.7-3 for Por - BM Technical Spec	1 (ONE) BARGE MASTER UNIT - C40 tules for Lifting Appliances in a Marin table offshore units, May 2011, the c cification doc. no. BM-PR010-PC-PF-R	0 e Environment, August 2009 ontainer certification scheme 2011 and -0042	ISO 1496-1
References - Lloyd's Register R - DNV 2.7-3 for Por - BM Technical Spec Design appraisal as per foll Structure – DAD OGL/TEC/1 Control – DAD ROT/12E.197 Container – DAD RET02415 Cylinders – DAD RDS/ENG/ Hydraulic system – DAD RD	1 (ONE) BARGE MASTER UNIT - C40 tules for Lifting Appliances in a Marin table offshore units, May 2011, the o cification doc. no. BM-PR010-PC-PF-R lowing documents: 120029, issue 3 7/GJV/vho, issue 2 39-01, issue 02 120148, issue 1 15/ENG/120132 – issue no. 1	© e Environment, August 2009 ontainer certification scheme 2011 and -0042	ISO 1496-1
References - Lloyd's Register R - DNV 2.7-3 for Portical Spectron Portical Spectron - BM Technical Spectron Design appraisal as per foll Structure – DAD OGL/TEC/1 Contrainer – DAD ROT/12E.197 Container – DAD RDS/ENG/ Hydraulic system – DAD RD The following scope of surrial a) Review of PQR's, c) Monitoring of fabres Schiedam, the Net O d) Witnessing of Ioa g) Witnessing of Ioa g) Witnessing of test	1 (ONE) BARGE MASTER UNIT - C40 tules for Lifting Appliances in a Marin table offshore units, May 2011, the of cification doc. no. BM-PR010-PC-PF-R lowing documents: 120029, issue 3 7/GJV/vho, issue 2 39-01, issue 02 (120148, issue 1 5/ENG/120132 – issue no. 1 Vey was carried out with satisfactory al certificates .WPQ's and NDE procedures prication activities at the sites of v.d therlands. ting of components at Bosch-Rexroth f unit and parts. d variation test of unit with a load of ting of Barge Master with 700T load.	© e Environment, August 2009 ontainer certification scheme 2011 and -0042 results: . Ploeg , Leeuwarden, Bosch –Rexroth, , Boxtel and Barge Master. f 155 T at port conditions	ISO 1496-1 Boxtel, and Barge Master,
References - Lloyd's Register R - DNV 2.7-3 for Pori - BM Technical Species Design appraisal as per foll Structure - DAD OGL/TEC/1 Control - DAD ROT/12E.197 Container - DAD RET02415: Cylinders - DAD RDS/ENG/ Hydraulic system - DAD RD The following scope of surval a) Review of materia b) Review of PQR's, c) Monitoring of fab Schiedam, the Nei Ol Witnessing of test d) Witnessing of test g) Witnessing of test Uoyd's Register, its affiliates and f Register Group'. The Lloyd's Register foroup' the Lloyd's Register information or advice in this docu	1 (ONE) BARGE MASTER UNIT - C40 tules for Lifting Appliances in a Marin table offshore units, May 2011, the c cification doc. no. BM-PR010-PC-PF-R lowing documents: 120029, issue 3 7/GJV/vho, issue 2 39-01, issue 02 120148, issue 1 15/ENG/120132 - issue no. 1 vey was carried out with satisfactory al certificates WPQ's and NDE procedures brication activities at the sites of v.d therlands. ting of components at Bosch-Rexroth f unit and parts d variation test of unit with a load of ting of Barge Master with 700T load. subsidiaries and their respective officers, empl ster Group assumes no responsibility and shal subsidiaries and their respective officers, empl in that case any responsibility or liability is excle	over sor agents are, individually and collectively in the liable to any person for any loss, dama on has signed a contract with the relevant Lloys sively on the terms and conditions set out in than the terms and conditions set out in the terms a	ISO 1496-1 Boxtel, and Barge Master , referred to in this clause as the 'Lloyd ge or experse caused by reliance on th 's Register Group entity for the provisio contract.



APPENDIX B: CERTIFICATION BM-T40

		Certificate no:	RET0263621/1D
		Page 1 of 2	
IS I			
	Certificate		
Project	Barge Master T40 including 15T knuckle boom crane /no. 1236		
Client	Barge Master , Capelle a/d IJssel, the Netherlands	Office:	Rotterdam
Client's Order Number	BM-26112013	Date:	04 October 2015
		Order Status:	Complete
Inspection Date: First	26 November 2013	Final:	28 April 2015
This certificate is issued to the Machinery by , Genemuide Netherlands on and betwee lifting equipment:	above named dient in order to certify that th n ; Bosch Rexroth , Boxtel ; Lagendijk B.V. , We en above mentioned dates in order to survey	e undersigned Surveyors did att meldinge and Shipyard Niesterr the fabrication and witness the t	end the sites of Breman 1 Sander , Delfzijl , the testing of the undernoted
	ONE (1) BARGE MASTER T40 UNIT wi Knuckle Boom Crane (SWL 15T)	th	
References: Lloyd's Register Code for Li testing and certification of The following scope was ca	ONE (1) BARGE MASTER T40 UNIT wi Knuckle Boom Crane (SWL 15T) fting Appliances in a Marine Environment, edt materials, July 2013 and NEN-EN 13852-1 / Ger	th . August, 2009, Lloyd's Register l ieral purpose offshore cranes (po	Rules for the manufacture, ersonnel lifting).
References: Lloyd's Register Code for Li testing and certification of The following scope was co a) Certification of Barge M b) Certification of 15T Knu	ONE (1) BARGE MASTER T40 UNIT wi Knuckle Boom Crane (SWL 15T) fting Appliances in a Marine Environment, edt materials, July 2013 and NEN-EN 13852-1 / Ger mied out with satisfactory results: aster T40 unit as per LR certificate RET026362 ckle Boom Crane as per LR Certificate RET02666	th . August, 2009, Lloyd's Register I teral purpose offshore cranes (p 1/1B dated 28.04.2015 411/1A dated 23.04.2015	Rules for the manufacture, ersonnel lifting).
References: Lloyd's Register Code for Li testing and certification of The following scope was ca a) Certification of Barge M b) Certification of Barge M b) Certification of 15T Knu c) Witnessing of load test of Overload test in offshore n with a load of 25 mT (1.25 Carried out thorough visua d) Witnessing of site accep in LR VR RET0259658 / JME f) Witnessed sea trials of as	ONE (1) BARGE MASTER T40 UNIT wi Knuckle Boom Crane (SWL 15T) fting Appliances in a Marine Environment, edt materials, July 2013 and NEN-EN 13852-1 / Ger arried out with satisfactory results: aster T40 unit as per LR certificate RET026362 ckle Boom Crane as per LR Certificate RET026560 of assembly (crane and T40) as carried out acco tode with a load of 18.75 mT (1.25 x 15 mT) at k WLL) at 10 m and 8.625 mT at 24m. (main ho al inspection after the load testing , observed stance testing (SAT) of T40 unit executed accor 2015-02. Review and endorsement of (test) re sembly (T40 unit including crane) according B	th . August, 2009, Lloyd's Register / teral purpose offshore cranes (po 1/1B dated 28.04.2015 411/1A dated 23.04.2015 rding BM-PR077-EN-WM- R-039 10 m. and 5.0 mT at 24 m. (main ist) . no deformations and/or defects. ding BM -PR 077-EN -WM- R -042 sport(s).	Rules for the manufacture, ersonnel lifting). 6, rev. 0. hoist) and in harbour mode 18, rev. 0. Results as specified WM-R-0369 , rev. 0. Results
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Certificate no: RET0263621/1D Page 2 of 2 Notes: - T40 /crane assembly is suitable for manriding (also when motion compensating system is in operation). - For application of the crane in combination with the T40 unit , AOPS will be activated for all crane positions and orientations both during on and off board lifting. AOPS is only deactivated when the mode for personnel lifting is selected as described in NEN-EN 13852-1 2011. Rotterdam Office oyd's Lloyd's Register Nederlan P. Kuijpers for A.J. Meijer , C. de Tempe, F. Blankestijn and self Surveyor to Lloyd's Register Nederland b.v. A subsidiary of Lloyd's Register Group Limited Form 1123 (2013.12)



APPENDIX C: CERTIFICATION BM GANGWAY

		DNVGL		
CERTIFICATE		Certificate No: N141FBYA		
FOR GANGWAY				
This is to certify				
that the product:	Motion C Height A	ompensated Gangway (MCG) & Eccentric djustable Pedestal (EHAP)		
Type designation:	TYPE 2 0 system	ffshore gangway with motion compensating		
Application/context:	Person a	nd Cargo Transport		
Serial/tag no:	Please se	ee below		
DNVGL-ST-0358 Certificatiom of offshore gang Edition December 2015	jways for personnel 1	Fransfer		
The product is intended for				
Yard:				
Yard No:				
Name of vessel:	VOS STA	VOS START		
DNV GL Id No:	37761			
Particulars of Vendor an	d Purchaser			
Vendor:	Bosch Re	exroth B.V.		
Vendor reference:	NL00212	NL002123 / 4505607735		
Purchaser:	Vroon B.	Vroon B.V		
Purchaser reference:	PO 2016	00197		
Issued at Rotterdam, Product	Certification /Verifica	ation on 2017-08-08		
	BAFEGUARDING	for DNV GL		
/	18 64	This document has been digitally signed and will therefore not have handwritten signatures		
ME NO	DNV-GL	Ven, Arjen van der		
NUMER		Surveyor		
ONME.	AND THE EA			
	ANT ONA H			