SURVEY STATEMENT NARRATIVE ANNEX

DNV GL Id No: **27084** Job Id:

DNV·GL

644709-1 Revision No: a

<u>``CARLA MÆRSK "</u>
Maersk Tankers A/S
_9171503
_Miami
Freeport, Grand Bahama(BHS,Bahamas)
_2015-04-14
2015-07-13
Nikolopoulos, Grigorios

Hull Damage and Repairs

Reference is made to the survey statement for the job referenced above for the documentation of the result of survey.

Narrative Report

Upon Owner's request subject vessel was attended by the undersigned surveyor during her stay at the Grand Bahamas shipyard in Freeport, Grand Bahamas, between the 14th of April 2015 until the 13th of July 2015, in order to carry out permanent repairs on the Port side shell plating, bottom shell plating, internal structure and cargo tanks, after a reportedly collision incident at the Houston channel, and while she was under fully loaded condition. Upon vessel's arrival at the shipyard premises, she was initially placed alongside a repair pier and on the 30th of April she was docked. Vessel undocked on the 8th of July.

In detail, the damage extended from Frames 68 to 78; Water ballast tanks, 2(P) & 3(P) were affected. Cargo tanks 3(P), 4(P) and 5(P) were damaged as well, with the largest damage in way of Cargo Tank 4(P). The longitudinal bulkhead between Water Ballast Tank 2(P) and Cargo Tank 4(P) was renewed at approximately 90%. Corrugated bulkheads between Cargo Tank 3(P) and 4(P) as well as between 4(P) and 5(P) were partly inserted with newly fabricated corrugations.

Bilge keel side shell plates as well as internals, between frames 69 and 76 were complete renewed.

Upon entry to the dry-dock and due to the damaged condition, vessel was initially supported externally by I-beams. Damaged structure was partially cropped and in a sequence such that the longitudinal strength of the vessel would not be affected.

The shipyard presented the repair plan, in which it was indicated how the damaged structure would be replaced in sequence, by totally eight new hull blocks, which were fabricated inside the hull shop of the shipyard.

Drawing approval was not deemed necessary based on the assumption and agreement between the shipyard, Owners' representatives and DNVGL surveyor that the newly fabricated hull blocks would be of identical design as indicated in the original drawings.

Steel plates used were noted being of high strength steel, all ABS and LRS Certified. Re-certification of the steel plates according to DNVGL requirements took place. Steel plates received in the shipyard and intended for the vessel's new hull blocks were verified against presented material certificates and DNVGL / IACS requirements for mechanical properties and chemical composition.

WPS and Welders' qualification were randomly verified throughout the repair period. Some WPS were noted already approved, however, in some cases the shipyard had to prepare new WPS which were later approved by LRS.

Verification of the newly fabricated blocks took place in several stages. Initially at the hull shop during the fabrication, in the form of unscheduled joint surveys. Upon completion of each new hull block, a final visual examination was conducted with all parties present.

Nesting / Cutting plans were submitted and material traceability was verified on several occasions.

Upon final examination of each new hull block at the hull shop, the new structure was brought onboard and fit on the existing structure. A fit-up survey was carried for each and every new block, prior to the final welding. Particular attention was given to the critical points and details as marked in the original hull drawings, i.e. upper and lower knuckle points, were the alignment (of the new structure with the existing one) of three different plates in three different directions is very important. Another example is the externally installed transverse web frames on the upper deck and the end connection detail as well as alignment to the underdeck transverse web frames.

Upon final welding, a final examination was conducted for each new hull block. NDT points were indicated by both the DNVGL surveyor and Owner's representative. NDT methods requested were UT and Radiographic. NDT reports are available for review.

Water ballast tanks were noted coated with hard coating. New sacrificial anodes were noted installed.

Upon completion of the repairs, an air leak test was conducted for every new tank boundary. Tanks were filled with air up to a pressure of 0.2 Bar.

Finally, a hydrostatic pressure test was conducted for each tank, and tank boundaries were examined for leakages / structural deformations. Each tank was filled with sea water, using the ship's pumps, to the top of the tank access hatch.

Upon completion of all repair works and tests, the previously issued conditions of Class related to the hull damage, namely CC 9 and CC 10 were deleted by the attending surveyor.



View of damage in the underwater area.



Block No.2 being fitted onboard, without the side shell plate.



Block No.1 fabrication inside the shipyard's hull shop.



Welding surface preparation (groove) for butt joint connection of 32mm plates for the "ice belt" area



View of damage on the upper deck



Block No.1 fitted onboard.



Nearing completion of repairs on 22nd of June



Inserts on upper deck, in way of Cargo tank No.4(P)



View of Side shell and partly of internals damage from the pier



CTk 3(P) - Hydrostatic pressure test carried out on July 10th



CTk 5(P) - Hydrostatic pressure test carried out on July 10th



July 9th, vessel afloat.



Repairs completed, July 8th.



WBTk 3(P) - Hydrostatic pressure test carried out on July 11th



One side shell insert remaining on 29th of June for completion of steel repairs



Vessel entering the shipyard premises on the 14th of April 2015



Block No.3 fit-up survey



Several blocks installed from Fr.69 and forward. Preparation for fit-up survey.



View of damage in way of WBTk No. 2(P), after removal of the damaged side shell.



On the upper deck longitudinal stiffeners inserts - View 2



Repairs in progress.



Newly fabricated bilge keel fin installed



On the upper deck longitudinal stiffeners inserts - View 1