CARRIAGE OF CONTAINERS ON BULK CARRIERS

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ABS

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Current market conditions are allowing for bulk carrier owners to explore the possibility of carrying containers either in their holds or on their hatch covers. While this practice can be acceptable, it does require engineering review and survey to ensure compliance with the appropriate Rules and Statutory Conventions.

The following instructions are provided for the conversion of a bulk carrier to a vessel capable of loading containers.

For each project the owner of the vessel or their representative is to submit the necessary information to demonstrate compliance with the items listed in this document.

1. COMMON UNDERSTANDING

a. The type of vessel will still be listed as "Bulk Carrier" in Class and Statutory certificates.

b. The current hold and tank arrangement will be kept unchanged.

c. If a permanent conversion is desired and vessel designation is being altered with associated Class notations, more detailed arrangements are to be presented for review and approval by ABS and Flag.

d. Some of the items listed below may not be applicable, depending on the intended container carriage plan.

e. Prior to carriage of containers on board bulk carriers, the owner shall contact the concerned insurance companies and Flag Administration for concurrence. ABS will be able to assist with communication with the Flag Administration regarding statutory compliance.

2. HULL STRUCTURE

a. Hull Structures under container stack:

Option 1: The uniform loads on tank top, upper deck, and hatch covers are to be determined based on as-built scantlings. The bottom tier containers should be stowed on timber of sufficient thickness, arranged in such a way as to transfer the stack load evenly on to the structures of the stowage area. Calculations are to be submitted to confirm the timber strength.

Option 2: Fixed fittings (e.g., socket, cone, etc.) are to be provided on inner bottom, main deck or hatch cover similar to a traditional container carrier. The corresponding supporting structures are not to interfere with existing structural elements and are to be evaluated in accordance with the following applicable requirements:

- ABS MVR 5C-5-4/13.13 "Container Supporting Structures"
- ABS MVR 3-2-15 "Protection of Deck Openings"

b. The structural reinforcements in way of fixed securing device: The reinforcements in way of eye plates, D-rings, etc. for lashing are to be provided and submitted for review.

3. STABILITY

a. Intact stability in accordance with the 2008 Intact Stability Code, considering the windage profile of maximum container loadings.

b. Damage stability calculation in accordance with the SOLAS II-1/Reg.6 probabilistic damage stability requirements for cargo ships if the vessel is originally designed as Type B-60 freeboard.

c. The loading manual and trim & stability booklet are to incorporate the new minimum metacentric height (GM) limiting curve derived from the above intact & damage stability and intended container loading conditions.

d. Onboard stability software and loading instrument to be updated with the new minimum GM limiting curve and new function for container loading.

4. SOLAS

a. The navigational visibility is to be maintained with due consideration of containers on hatch covers. The Cargo Securing Manual and/or Container Securing Arrangement is in accordance with the Code of Safe Practice for Cargo Stowage and Securing

b. Fixed gas fire-extinguishing system complying with FSS code in cargo hold is to be provided.

c. For carriage of containers on or above weather deck,

   i. at least one water mist lance is to be provided.

   ii. if carriage of five or more tiers of containers, mobile water monitors as per SOLAS II-2/10.7.3.2 are to be provided (refer to UI SC270).

d. For carriage of International Maritime Dangerous Goods (IMDG) cargos on or above weather deck, applicable requirements in SOLAS II-2/19 are to be complied with, and compared with conventional bulk carriers, additional requirements are as follows:

   i. Portable extinguishers with total capacity of 12 kg of dry powder or equivalent shall be provided for cargo spaces.

   ii. All Dangerous Goods (DG) cargoes, except cargoes of Class 1.4S, Class 6.1 (liquids with FP>60 degree C and solids), Class 8 (liquids with SFP>60 degree C and solids) and Class 9, are not to be carried on or above the engine room unless the common boundaries are insulated to A-60 class standard with the exception that Classes 1.1~1.6 DG cargoes are to be stowed 3 m horizontally away from the machinery space boundaries in all cases.

   iii. Except for Classes 1.1~1.6, Class 1.4S and some inappropriate Class 9 DG cargoes, four sets of full protective clothing resistant to chemical attack and two self-contained breathing apparatuses with two spare charges for each, in addition to those required by SOLAS II-2/10.10, are to be provided onboard.

e. For carriage of IMDG cargoes in the bulk cargo holds, subject to intended cargos to be carried, the following requirements in addition to those for conventional bulk carriers are to be complied with:

   i. Water spray system is to be provided in the bulk cargo holds if cargoes of DG Classes 1.1~1.6 are intended to be carried therein.

   ii. No electrical equipment is to be installed within dangerous areas unless electrical equipment is of certified safe type.

   iii. Mechanical ventilation is to be provided for the bulk cargo holds at the required hourly change rate for the DG cargoes. The ventilation fans are to be of certified safe type for intended use, and suitable mesh guards are to be fitted over inlet and outlet of ventilation openings for DG cargoes of Class 2.1, Class 3 with FP<23 degree C, Class 6.1 liquids with FP<23 degree C, Class 8 liquids with FP<23 degree C and Class 9 evolving flammable vapor listed in the IMDG Code.

   iv. Where the flammable or toxic liquids (Class 3 with FP<23 degree C, Class 6.1 liquids, Class 8 liquids with FP<23 degree C and Class 8 liquids with FP≥23 degree C but having subsidiary risk of Class 6.1) are carried, bilge in cargo spaces is to be isolated from the bilge line served by machinery space piping, and an additional pumping system is to be provided for such purpose.

   v. Common bulkhead between the Engine Room (ER) and the cargo hold is to be insulated to A-60 class standard in the case that DG cargos, except Class 1.4S, Class 6.1 (liquids with FP>60 degree C and solids), Class 8 (liquids with FP>60 degree C and solids) and Class 9, are intended to be loaded in the cargo hold adjacent to ER, unless the cargoes are stowed away from the common bulkhead for at least 3 m. However, Classes 1.1~1.6 DG cargoes are to be stowed 3 m horizontally away from the machinery space boundaries in all cases.

   vi. Fire detection system or sample extraction smoke detection system is to be provided for container cargo space.

   vii. Except for Classes 1.1~1.6, Class 1.4S and some inappropriate Class 9 DG cargoes, four sets of full protective clothing resistant to chemical attack and two self-contained breathing apparatuses with two spare charges for each, in addition to those required by SOLAS II-2/10.10, are to be provided onboard. (Note: Whether the DG cargoes are carried on or above the weather deck or in the bulk cargo holds, the total required additional numbers onboard are just 4+2)

   viii. The requirements in e) and f) above are not to be considered as prescriptive requirements covering any class of Dangerous Goods. The requirements of SOLAS Tables II-2/19.1 and 19.3 for the specific classes of dangerous goods are to be verified during the review. The Document of Compliance (DOC) and/or cargo list are to be reviewed against additional requirements that might be required for the carriage of DGs in packaged form. See also Marine Vessel Rules (MVR) 5C-5-7/Table 3.

   ix. Safe access to bow arrangements

5. REFRIGERATED CONTAINER

Where the refrigerating plant is electrically driven, the capacity of the generating sets is to ensure the operation of the services essential for the propulsion and safety of the ship and services for providing minimum comfortable conditions of habitability and required container service. The electrical power sockets for these refrigerated containers are to be considered.

6. CONTAINER STOWAGE AND SECURING

The number of containers that can be stowed depends on the following:

a. The hatch geometry and the flat tank top area in the hold, which define the row and bay numbers on hatch cover/ in hold.

b. The securing method and the strength of the container, securing device and hull supporting structures, which limit the maximum tier number, stack vertical center of gravity (VCG) and weight. For containers stowed on deck/ hatch cover forward of the accommodation deckhouse, visibility requirement may also limit the highest tier of the container stack. In this regard, the container stowage plan is to be submitted for our reference.

For stowage and securing of the containers, two options corresponding to 2.a) are presented below:

Option 1: Container stacks are secured to each other and considered as a whole cargo piece. In this way, rows of containers are stacked in close proximity with appropriate securing and contact elements/spacers fitted in between the adjacent containers to ensure no relative motion. The lashing calculation and the securing operation could be performed in accordance with the approved Cargo Securing Manual and the Code of Safe Practice for Cargo Stowage and Securing (CSS Code) under the responsibility of the Master. In this case, the Cargo Securing Manual is to be submitted for approval if not available on board and the structural reinforcements are to be reviewed for the new fixed securing fittings added on the vessel.

Option 2: Each container stack is secured by fixed and portable securing devices as a purpose-built container vessel does to maximize the number of stowed containers, stack weight and VCG. The container stack is secured individually at both ends and the two ends are normally assumed to be independent from each other in the lashing calculation. The ABS Guide for the Certification of Container Securing Systems and C-Lash software may be applied to quickly perform the assessment. Special attention is to be paid to the draft and GM of the loading condition in the Loading Manual since a bulk carrier stowing containers is generally at light draft and high GM. In this case, the Cargo Securing Manual including container securing arrangement and the drawings indicated in 2.a) & b) are to be submitted for our review.

7. SURVEY REQUIREMENTS

During the Initial Survey for the modifications, the Surveyor will:

a. Verify all changes in accordance with approved drawings.

b. Verify cargo securing manual for the minimum amount of lashing gear provided.

c. Verify updated cargo loading manual/computer and test cases.

d. Verify arrangements for temporary generators packs for reefers, if installed.

e. If any dangerous goods to be carried, as approved by ABS Engineering, then the Initial DOC survey to be completed as per engineering review and “DOCUMENT OF COMPLIANCE, Special Requirements for Ships Carrying Dangerous Goods” will be issued.

   i. Note that Engineering review is required, and all fire-fighting appliances are to be in place and safety gear provided.

f. Advise the owner that the Safety Management System (SMS) to be revised to include the additional use of containers, and that the vessel will be subject to an additional audit to verify additional risks have been addressed and operational and emergency procedures verified.

After the modifications, the Annual Surveys requirements in addition to the requirements already in place for bulk carriers are as follows:

a. Container Carrier Annual Hull Survey requirements.

b. The DOC for Dangerous Goods Annual Survey will be examined, as applicable.

c. If installed, the Surveyor will verify arrangements for temporary generators packs for reefers, including power leads.

d. The Surveyor will perform additional examination of weather decks, hatch covers and coamings, plus any suspect areas, for corrosion, fractures and/or deformation.

e. The Surveyor will perform an internal examination of all cargo holds for:

   i. Bulk Carriers – Non-Double Skin Enhanced Survey Program (ESP) and Bulk Carrier Features of Combination Carriers – Non-Double Skin ESP at vessel 10 < Age ≤ 15 years

   ii. Bulk Carriers - Double Skin ESP and Bulk Carrier Features of Combination Carriers - Double Skin ESP after Age > 15 years.

f. The Surveyor will test the bilge system, water ingress detection and alarms for all cargo holds as bulk carriers subject to SOLAS XII/12 and XII/13 (2007) 7-3-2/1.19.3(a).

g. Vessels complying with SOLAS XII/12 only require water ingress detection and alarm systems for cargo holds, ballast and dry spaces to be examined and tested at the request of the attending Surveyor.

After the modifications, the Intermediate and Special Surveys in addition to the requirements already in place for Bulk Carriers are as follows:

a. Container Carrier Intermediate and Special Hull Survey requirements.

b. Above Annual Survey requirements.

c. Additional survey of inner bottom and hatch cover lashing installations.

If any questions or comments, please contact your local engineering or survey office or email us at abs-worldhq@eagle.org.

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