

Session 1 Safety issue : Coordinator by Mr. Byeong-cheol Choi(KOSHIPA)

1. GBS

1-1. HCSR

Shipbuilders' perspective on the application of IACS Harmonized CSR

Speaker : Mr. Hiroshi Negayama(SHI-ME)

The speaker started with current situation and preliminary comments on Harmonized CSR. For the preliminary comments on HCSR, he emphasized three points such as delay in schedule, provision of software tool, and economic inefficiency.

In the ASEF presentation last year, SAJ pointed out that the development of HCSR is a hard challenge with many hurdles such as 1. Harmonization of the current CSR-O/T and CSR-B/C, necessitating combination of different technical backgrounds. 2. Implementation of the requirements of GBS, requiring solution for difficult technological subjects. 3. Tight schedule for harmonization work and industries review.

As a problem of delay in schedule, he pointed out that the completion of verification work is impossible by the deadline of the 1st External Review and emphasized that the sufficient analyses and verification will be required for the technically important parts such as Fatigue & Direct strength analysis. Therefore, the period of 3 months for the 2nd External Review is not sufficient considering a huge amount of analyses and verification. Furthermore, it is questionable that Consequence Analysis works by IACS are enough to justify the newly introduced parts of HCSR. Finally, it is requested that IACS will reconsider the master schedule.

As provision of software tool, the speaker told it is obvious that the verification work for HCSR needs the special software provided by the Classification Society. However, at this moment, provision of the software tool for HCSR is not sufficient. The readiness and promise of each Classification Society seems to be different and vague. Therefore, it is requested that IACS explain the schedule and the coverage of the software being developed by each Classification Society at the present moment.

For the case of economic inefficiency, the speaker pointed out that the number of structural details requiring strength analysis has drastically increased compared with the current CSR. HCSR requires the Finite Element Analyses not only for cargo holds in midship part of ships but also those in fore and aft parts. Furthermore, loading patterns considered by FE Analysis have also further increased. Finally, the number of analyses in HCSR will be ten to twenty times of that of the current CSR.

The mentioned fact leads to a big increase of followings.

- design period and working time in shipyard
- designing cost of bulk carriers and oil tankers

It is inevitable for shipyards to include this cost increase to the price of vessels. This will make a considerable influence on Shipowners and shipbuilding market.

The speaker pointed out that a shipyard makes the calculation sheets of FE analyses with more than 1,000 pages in case of the current CSR, and that when HCSR is introduced, a shipyard should make them with 10,000 or 20,000 pages.

The speaker concluded with three points.

1. IACS should reconsider the master schedule in view of extension, especially “External Review” period.
2. IACS should explain the schedule & coverage of the software being developed by each Classification Society at the present moment.
3. IACS should reduce the number of FE Analysis cases to acceptable degree.

Preliminary Consequence Assessment on Harmonized CSR from Chinese Shipbuilding Industry

Speaker : Ms. Zhang Fan(MARIC)

The speaker showed Consequence Assessments on Harmonized CSR for the various types of ships, and also showed plating and stiffeners difference with Rule reference(External Release 1 July 2012).

The speaker pointed out.

1. FE buckling of HCSR makes a great impact on BC.
2. FE yielding of HCSR makes a little impact on BC.
3. The FE model of CSR-BC should be modified according to the modeling requirement of HCSR, such as deleting the openings and so on.

The speaker explained weight increase estimation. (unit : ton)

Weight Increase (Preliminary)	VLCC	Suezmax	Aframax	Panamax	Handymax
	+71 (1.2%)	+22 (0.8%)	+31 (1.9%)	+15 (1.0%)	+15 (1.6%)

Note : Only one cargo tank in amidship, including one W.T. Trans. BHD

The speaker concluded by the preliminary Consequence Assessments on Harmonized CSR.

- Increase of scantlings due to prescriptive requirement is higher than that due to FE yielding.
- The impact of HCSR on Bulk Carriers is greater than that on Oil Tankers.
- More attention should be paid to some findings during IACS Consequence Assessment or industry review, especially for Bulk Carriers.

1-2. SCF

Development of SCF(Ship Construction File) Industry Standards

Speaker : Mr. Shigeru Tanaka(MES)

The speaker made his presentation with 4 topics such as 1. Review of Ship Construction File 2. The way of development of the SCF Industry Standards 3. Outline of the SCF Industry Standards 4. Short and long term milestones.

- SCF shall be required in SOLAS II-1/3-10(GBS).
- SCF shall include specific information on how the functional requirement of the GBS(Tier II items) is applied in the ship design and construction.
- SCF shall be kept on board the ship and/or ashore.
- SCF shall be duly complied with Intellectual Property(IP) rights.
- Highly IP sensitive information shall be stored at ashore archive center for Yard Plan, Lines Plan and Bulky Output of strength calculation.

Cross industry team(owners, shipbuilders and class) has been developing the SCF industry standard toward practical operation.

Since 2009 the SCF has become a Tripartite “lighthouse project”. Owners, shipbuilders and class have developed an industry model to implement the SCF requirements.

IMO has approved the process at MSC 87 and published MSC.1/Circ. 1343 in June 2010. The Cross Industry team discussed the way ahead and potential security measures at MSC 87 and 89. Since then the shipbuilding industry has worked globally to prepare the draft SCF Industry Standards(SCF IS) Ver. 1.0.

The activities after the last ASEF for the development of the SCF Industry Standards have been carried out through Shipbuilder’s Meeting in Busan in Oct. 2011, in Shanghai in May 2012 and Cross Industry Meeting in Denmark in Oct. 2012.

The speaker explained as rights and obligations of the parties in typical events.

- upon newbuilding of ships
- upon update of SCF information
- upon periodical renewal of SCF access security measures
- upon dismantling of ships

The speaker explained that access to SCF Info is defined according to each IP Security Level, and the procedure of Access to SCF Supplement Ashore with High IP Security Level in detail.

“Other” Access Right Holders are as follows.

- sub-contractor(repair shipyards, etc.)
- flag state
- port state
- the registered class
- coastal state

Finally, the speaker introduced a short and long term milestone.

1-3. SLA & Risk-Based design

[Study on the risk-based methodology for ship structural design](#)

[Speaker : Mr. Choung-ho Choung\(KR\)](#)

The speaker dealt with 1. Safety Level Based Hull Scantling Assessment 2. Safety Level of Local Supporting Member 3. Case Study.

The speaker explained the concept of risk-based design/approval of ships.

- new design paradigm based on the risk assessment
- probabilistic approach, not deterministic
- Safety level approach is one of the key methodology for RBD/A.
- activities to apply RBD/A into ship design/approval

The speaker touched assessment procedure, and explained a case study with a double hull oil tanker having the length of 234 m(LBP), and dead weight of 105,000 ton. The case study result shows that current design of the stiffener is safe enough both from the viewpoint of “safety level approach” and from the viewpoint of “deterministic approach”.

The speaker emphasized that specific safety level of a given structural design could be quantified in consideration of ship’s operating scheme(i.e. time dependent safety level) as well as deviation, that is potential while constructing, from the intended design.

The speaker concluded as the points of consideration on application.

1. Target safety levels for ship structural members should be established.
2. Design variables such as loads, material, fabrication and modeling are needed.
3. Calculation tools of software should be provided to users.

2. Noise on Board

Technical practices for revision as mandatory rule of the IMO Resolution A.468 for noise

Speaker : Mr. Sung-hoon Kim(Hyundai Heavy Industries)

The speaker touched progress of revision, regulation, and technical practices for noise, and explained that MSC 90(2012.6) approved the draft Code with a view to adoption at MSC 91(November 2012).

The speaker emphasized that new ships of 1,600 gross tonnage and above are to be applied and also explained that some types of ships as follows are not applied.

- dynamically supported craft
- high-speed craft
- fishing vessels
- pipe-laying barges
- crane barges
- mobile offshore drilling units
- pleasure yachts not engaged in trade
- ships of war and troopships
- ships not propelled by mechanical means
- pile driving vessels
- dredgers

The speaker compared noise level limits, sound reduction index, and noise measurement condition and procedures between IMO A.468(XII) and Regulation with tables, and introduced Development of Noise Prediction Method, Large Scale Noise Test Facilities, Advanced Noise Control Method, Noise Level of Various Ships, Countermeasures for Noise Reduction Index, Countermeasures for Cargo Handling & Outdoor Noise as technical practice.

The speaker exemplified some countermeasures for Standard Ships.

■ 318K VLCC

Cabins and hospital located on sunken deck or upper deck

→ Changes of arrangement(Noise reductions : 5 dB)

Pipelines of cargo pump

→ Separated arrangement from the noise sensitive areas(Noise reductions : 3 dB)

■ 5000 TEU Container Carrier

Recreation rooms on upper deck

→ Floating floor on deck structure(Noise reductions : 6 dB)

Public spaces on A deck

→ Separation of exhaust pipes and countermeasures for deck structures(Noise reductions : 5 dB)

Cabin on B deck

→ Noise reduction of transmission from ducts connected to engine ventilation fans(Noise reductions : 4 dB)

The speaker concluded as follows.

1. IMO Resolution A.468(XII) adopted on November 1981 will be revised as more severe regulation which is mandatory as SOLAS regulation.
2. The Committee in MSC 90(July, 2012) approved the draft Code with a view to adoption at MSC 91(November, 2012)
3. The main items are noise levels of accommodation and work space, and sound reduction index in accommodation.
4. Various operating conditions such as cargo handling should be considered in ship design stage.
5. Noise level of relatively small gross tonnage normally has a higher noise level of cabin than large gross tonnage. The main causes are that the accommodation will not be sufficiently far away from propeller and engine room. It is expected that the relatively small size ship needs more countermeasures to meet the new noise code than large size vessel.

[The design technique of cabin noise control on merchant ships](#)

[Speaker : Mr. Qi Libo\(CSSRC\)](#)

The speaker started saying that the pollution and harm of the ship cabin noise to human and the environment have already attracted attention of international community and related organizations.

The speaker explained the draft Code on noise levels on board ships approved by MSC 90

The speaker emphasized that industry partners' attention should be paid to the IACS submission(MSC 91/3/14), and pointed out, with some examples, that a dozen of comments/problems proposed/identified by IACS were also identified.

The speaker also emphasized that IACS' submission is timely and major ambiguities/impracticality in the draft Code shall be addressed/cleared up before IMO finally adopts the Code.

The speaker mentioned that the mechanism study and control of cabin noise also get the concern of more and more scholars.

As general control method, the speaker explained sound-absorbing material, acoustic shield, and packing block.

The speaker explained prediction technique with an example of 80,000t Panama cargo ship, and also emphasized that prediction technique is the core of cabin noise control.

The speaker concluded for the design technique of cabin noise control on merchant ships as follows.

1. There are still some issues to be clarified in MSC before adoption.
2. The prediction method is the key technique of cabin noise control design.
3. The cabin noise prediction is the crux process of the cost control.

3. Polar Code

Brief instruction on IMO Polar Code

Speaker : Mr. Bai Yugang(CSDC)

The speaker made a presentation with the topics of

1. brief introduction of two poles
2. human activity and problems on polar waters
3. rules/regulations on polar waters

There is relatively little multi-year ice in the Antarctic; conversely, a significant amount of multi-year ice in Arctic. The Arctic is currently less protected by international law compared to the Antarctic. The marine environments of both Polar seas are similarly vulnerable.

The speaker told that huge oil and gas reserves in the Arctic area are estimated up to 25 % of the world's undiscovered resources. The Arctic is warming up now. The multi-year ice covering the Arctic Ocean has effectively vanished. An increasing number of experts feel that the North Pole will be ice free in summer by 2030 at the latest, for the first time in a million years.

The speaker showed two main routes on the map and explained.

- Northwest Passage(NWP)
- Northern Sea Route(NSR)

The speaker pointed out that these two routes are short for the international trade, though subject to ability to operate in severe ice conditions and very cold climate.

The speaker also showed some threats on polar region environment.

- spill
- operational discharges
- ship air emissions
- black carbon emissions
- introduction of alien invasive species
- ship strikes on marine mammals
- anthropogenic noise
- loss of containers with packaged dangerous goods
- anti-fouling systems which release biocides

The speaker explained Baltic system, Russian system, and Canadian system as current regulatory regimes.

The speaker also touched Polar Class by IACS and specific guidelines for the polar regions by IMO. Especially the speaker emphasized that other Class Societies have their own ice class or polar class, and that harmonized, mandatory Polar Code by IMO is urgently needed for safety and environmental protection.

The speaker explained the IMO Polar Code progress in detail.

Categories of ships operating in polar waters

Ship Category A(Polar class) : Operating in waters with 10 % or more ice

Ship Category B(Ice-strengthening) : Operating in waters with less than 10 % ice, but may pose a structural risk

Ship Category C(No ice-strengthening) : Operating in waters with 0 % to 10 % ice, but does not pose a structural risk

The speaker finally concluded.

1. It is very necessary for human being to explore, investigate, research and develop polar.
2. Under ensuring safety of people and property, human being has responsibility and obligation to protect polar environment.
3. Shipbuilding industry should strengthen cooperation and address a reasonable polar code.

Thank you very much for your kind attention.