Introduction:

PSCC50 proposed a CIC on stability in general in view of several recent stability related incidents. The primary contributing factor in all these incidents was a lack of assessment that the ship had adequate stability upon completion of cargo operations and before departure of the ship.

Purpose:

The purpose of the campaign on ship's stability in general is:

- to confirm that the ship staff are assessing the actual stability condition on completion of cargo operations before departure of the ship and on all stages of the voyage;
- to create awareness among ship staff and ship owners about the importance of calculating the actual stability condition of the ship on completion of cargo operations and before departure of the ship;
- to verify that the ship complies with intact stability requirements (and damage stability requirements, if applicable) under the relevant IMO instruments;

References:

- International Convention on Load Lines, 1966, as modified by the 1988 Protocol relating thereto, as amended (Load Lines Convention)
- International Convention for the Safety of Life at Sea, 1974 and the Protocol there to of 1988, as amended (SOLAS 74, as amended)
- MARPOL, Annex I & II
- International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW)
- Mandatory IMO Codes

Definitions:

KG: The position of the centre of gravity of the ship indicated by its height above the keel.

LCG: The position of the centre of gravity of the ship indicated by its distance from the after perpendicular.

GM: GM is the vertical separation between the centre of gravity (KG) and the transverse metacentre (KM) of the ship (GM= KM-KG). GM is termed positive when KG is less than KM and termed negative when KG is greater than KM.

Free Surface Correction (FSC): A virtual rise in the centre of gravity and a consequent virtual loss of GM occurs whenever there is a free surface of a liquid in any compartment in the ship. This loss is not present if the tank is either completely full or empty, as there is no free surface of liquid in either of these conditions

FSC= FSM/Displacement

Free Surface Moment (FSM): (Moment of inertia of the free surface area) x (Density of liquid in the tank)

GM (Fluid) or Corrected GM: Corrected GM= GM-FSC

Righting Lever (GZ): The Righting Lever GZ is the perpendicular distance between the ship's centre of gravity and the vertical line through the centre of buoyancy in an inclined condition. For small angles of heel, GZ= GM x sin (angle of heel)

Righting Moment or Moment of Statical Stability: Displacement x GZ

Intact stability criteria: (Cargo Ships-Generic)

- The area under the GZ curve should not be less than 0.055 meter-radians up to an angle of heel of 30 degrees.
- The area under the curve up to an angle of 40 degrees or the angle of flooding (whichever is least) shall not be less than 0.09meter-radians.
- The area under the curve between 30 degrees and 40 degrees or the angle of flooding (whichever is least) shall not be less than 0.03 meter-radians.
- The righting lever GZ shall be at least 0.20m at an angle of heel equal to or greater than 30 degrees
- The maximum righting lever should occur at an angle of heel preferably exceeding 30 degrees but not less than 25 degrees
- The initial metacentric height (GM) should not be less than 0.15m
- Provision shall be made for a safe margin of stability at all stages of the voyage, regard being given to addition of weight, such as those due to absorption of water and icing and to loss of weight, such as those due to consumption of fuel and stores.

Passenger ships, ships carrying timber deck cargo and using timber loadlines, ships carrying grain in bulk and offshore supply ships should comply with the intact stability criteria as appropriate.

Inspection:

The inspection must be performed in accordance with PMoU procedures. The campaign does not affect the type of inspection to be conducted in accordance with the procedures. The campaign consists of a list of questions to be answered in addition to the regular inspection. The CIC does not limit the PSCO during the regular inspection to check further compliance with the relevant IMO Instruments regarding the ship's stability in general. Where information is to be sought or consulted, the PSCO must be guided by the following guidance.

In arriving at a "YES" or "NO" answer to each of the questions of the questionnaire, the following should be considered:

- Should a question be answered "NO", a deficiency using the appropriate deficiency code listed in the guidance to the question must be used on the report of inspection Form "B"
- A "NO" answer in the questionnaire should not automatically lead to detention of the ship. In this case, the PSCO should use his/her professional judgement to determine whether the ship should be considered for detention.
- The column "N/A" can only be used for questions 3,6,7 and 8.
- The CIC will be considered as an initial inspection. However, if clear grounds are established to justify carrying out a more detailed inspection in other related areas, PSCOs may wish to consider the following:
  Damage control plans
  W/T doors, hatch covers
  Indicators of watertight doors and watertight access hatch covers

Questionnaire guidance

Q1*- Has the ship been provided with approved and correct stability information which can be understood and easily used by the Master?

The PSCO should check:

- whether the ship has been provided with stability information approved by the Administration or Recognised Organisation acting on behalf of the Administration.
- that the approved stability information can be understood by the Master and loading officer.
- whether the approved stability information has been amended to consider any alterations to the ship's structures.

Explanatory notes:

ICLL Regulation 10.1) and 2) states that the Master shall be supplied with sufficient information, in an approved form, giving guidance for the stability of the ship under varying conditions of service and to avoid the creation of unacceptable stresses (02103).

Note that:

From the damage stability point of view ICLL Convention Reg. 27 has specific requirements for damage stability of some ship types (A, B-60 and B-100). These damage stability requirements can be either treated separately in the Stability booklets or incorporated in the approval of damage stability requirements in SOLAS, MARPOL or in other instruments developed by the Organization.

The PSCO shall ensure that the approved Stability Booklet and strength data, if needed, is on board and where required, an approved Loading Manual is on board.

Convention references:

ICLL 1988 Protocol / ANNEX I / Reg. 10
(constructed on or after 21/07/1968 and before 01/01/2005)
ICLL 2003 Amend / ANNEX I / Reg. 10
(constructed on or after 01/01/2005)
SOLAS 1960 / Chapter II / Reg. 19 (for ships constructed before 25-5-1980)
SOLAS 1974 Convention / Chapter II-1 / Reg. 19 (for ships constructed On or after 25-5-1980 Before 1-9-1984)
SOLAS 1981 Amend / Chapter II-1 / Reg. 22 (for ships constructed On or after 1-9-1984 Before 29-4-1990)
SOLAS 1988 Amend / Chapter II-1 / Reg. 22 (for ships constructed On or after 29-4-1990 Before 1-2-1992)
SOLAS 1989/1990 Amend / Chapter II-1 / Reg. 25-8 (for ships constructed On or after 1-2-1992 Before 1-1-2009)
SOLAS 2006 Amend / Chapter II-1 / Reg. 5-1 (for ships constructed On or after 1-1-2009 Before 1-7-2020)
SOLAS 2017 Amendment (98th) / Chapter II-1 / Reg. 5-1 (for ships constructed on or after 1-7-2020)
SOLAS 2008 Amend, Ch.II-1, Reg.5-1 (S 74 Ch.II-1, Reg.19 / S 81 Ch.II-1, Reg.22)
SOLAS Ch.VI 1991/1992, Reg.9, Grain code Part A, 6

Deficiency Code:	01326- Stability Information Booklet
Nature of defect:	Not as required, Missing, Not approved, Incomplete,
Suggested action taken:	17, Ground for detention (tick box)

PSCOs are advised to refer to RULECHECK to decide on the appropriate convention reference.

Q2*- Is the data used in the stability check for departure complete and correct?

The PSCO should check:

- whether the correct light weight, including the position (LCG, VCG, TCG) of the ship has been applied in the stability calculation
- whether the correct density of liquids such as fuels (MGO/HFO), ballast water, fresh water have been used in the stability calculation
- whether the correct density has been used for the stability calculation (dock water, sea water, fresh water)
- whether the correct cargo information has been used for the stability calculation
  - Verified Gross Mass (Containers)
  - Stowage Factor and Gross mass (Bulk and general cargo)
  - Specific gravity/density (Liquid cargo)

- Number of vehicles, weight, VCG/LCG of freight vehicles (Ro-Ro cargo)
- Number of passengers (Passenger ships)

- whether the correct tank content volumes have been used for the stability calculation (cargo and ballast)
- whether the VCG/LCG have been applied correctly in the stability calculation
- whether the correction for trim has been applied for obtaining ballast and fuel tank volumes
- whether the effect of free surface of partially filled tanks has been considered in the stability calculation.
- whether the effect of the adverse environmental conditions such as ship's deck and superstructure icing has been considered in the stability calculation.

  Unknown weight is counted in as "constants" or "unknown constants" in the stability calculation in general. Such weight consists of the residues in tanks, attached organisms on the bottom and side shell, additional paint, equipment etc. which created or fitted after delivery of the ship, and getting increased year by year usually. The constant is a number that only gradually changes over time. It shall not be adjusted per voyage to make numbers match (e.g. draught mark reading and calculated draughts). This should be verified by checking the constant of a series of previous voyages. If the constant varies per voyage there might be an issue with the cargo information presented to the vessel.
- whether the vessel has undergone alterations such as the installation of additional equipment or structures (e.g. scrubbers, cranes etc) which affects the stability data.
  Where any alterations are made to a ship so as to materially affect the stability information supplied to the master, amended stability information shall be provided. (2008 SOLAS Ch.II-1 Reg.5.4 / 2003 ILLC An.I Reg.10.4)

PSCOs should note that on passenger ships, the stability calculation is required to be carried out and records maintained by the retroactive requirement on SOLAS 1988 amendment Ch. II-1, Reg.8 /7.4 owever, there is no such requirement for cargo ships. For example, on cargo ships, it might be acceptable even if there is no evidence of stability calculation being made for voyages with almost the same loading condition as the one described in ships' stability booklet. The important matter is that stability condition is confirmed in any way for the next intended voyage.

Explanatory notes:

The stability information enables the master to operate the ship in compliance with the applicable requirements.

The master should ensure that the operating condition does not deviate from a studied loading condition or verify by calculation that the stability criteria are satisfied for this loading condition.
A studied loading condition can be found in the approved intact stability booklet. The calculation can be done either manually by use of the procedure described in the intact stability book or by use of an approved stability instrument.

Nevertheless, the master could use curves or tables for checking satisfaction with the stability criteria. This method could only be used when it is appropriate.
The curves or tables used for this method are:

- curves or tables of minimum operational metacentric height (GM) versus draught, or
- corresponding curves or tables of the maximum allowable vertical centre of gravity (KG) versus draught, or
- equivalents of either of these curves.

If the vessel is assigned a timber freeboard as per ICLL Reg. 44(7), provision shall be made for margins of stability if the vessel is carrying timber deck cargoes. In this regard, stability requirements as per IMO resolutionA.1048(27)) may be considered in the approved stability booklet.

As per SOLAS VI 1991/1992 Amend Reg 9 Cargo ships and bulk carriers, when loading grain, shall be loaded in accordance with the regulations of the International Code for the Safe Carriage of Grain in Bulk (MSC. 23 (59)) and must have a Document of Authorization for the carriage of grain (01110) issued either by the Flag Administration or by a Recognized Organization (RO) accompanying or incorporated into the approved grain Loading manual (01313), provided to enable the master to meet the stability requirements of the Code (06102).

The liquid in a partially filled tank is causing a free surface moment. The moment depends on the content of the tank and the density of the liquid. The intact stability book contains tables with the FSM for each tank and a calculation formula for the FSM. When an approved stability instrument is used, the calculation is made by the software.

The free surface effect has an adverse effect on the stability. Please see “definitions” for information on free surface effect, free surface moment and its formulae.

As a safety measure, the maximum value of FSM can be used in calculations. In this way any difference in tank volume, which could occur during the passage (e.g. fuel tanks, ballast tanks) will not affect the FSM.

The use of incorrect values results in either an overestimated value of FSM either an underestimated value of FSM. An overestimation increases the safe margin for the stability of the vessel and should not result in a deficiency. An underestimation reduces the stability of the vessel and should result in a deficiency.

The PSCO could, for example, ask the Master or other ship’s officers to demonstrate how they will carry out a stability check before departure. The Master may choose to demonstrate this by showing past records. (e.g. last departure)

The verification of the compliance can only be performed using correct data. The PSCO could check which method is used for the verification and check if the data is complete and correct.

Convention references:

ICLL 2008 Amend / Chapter I / Reg. 1SOLAS 2014 Amend, Chapter VI, Reg 2;
2008 IS CODE 2018 Amend / PART A / Chapter 2 (for ships constructed on or after 1.7.2010)
SOLAS 2008 Amend, Chapter II-1, Reg.20.1
SOLAS 2006 Amend / Chapter II-1 / Reg. 20 (passenger ships constructed on or after 1.1.2009 before 1.7.2020)
SOLAS 2017 Amendment (98th) / Chapter II-1 / Reg. 20 (passenger and cargo ships constructed on or after 1.7.2020)
SOLAS 1988 Amend / Chapter II-1 / Reg. 8.7.4 (for passenger ship constructed On or after 29-4-1990 Before 1-10-1994 – retroactive requirement)
SOLAS 1991/1992 Amend / Chapter II-1 / Reg. 8.7.4 (for passenger ship constructed On or after 1-10-1994 Before 1-7-1997)
SOLAS 1994/1995 Amend / Chapter II-1 / Reg. 8.7.4 (for passenger ships constructed On or after 1-7-1997 Before 1-7-1998)
SOLAS 1996-1998 Amend / Chapter II-1 / Reg. 8.7.4 (for passenger ships constructed On or after 1-7-1998 Before 1-1-2009)
GRAIN Code / Annex / Part A / 7
SOLAS 1960 / Chapter II / Reg. 19 (for ships constructed before 25-5-1980)
SOLAS 1974 Convention / Chapter II-1 / Reg. 19 (for ships constructed On or after 25-5-1980 Before 1-9-1984)
SOLAS 1981 Amend / Chapter II-1 / Reg. 22 (for ships constructed On or after 1-9-1984 Before 29-4-1990)
SOLAS 1988 Amend / Chapter II-1 / Reg. 22 (for ships constructed On or after 29-4-1990 Before 1-2-1992)

Deficiency Code: 01316- Cargo Information, 02134- Loading/ballast condition, 06102- Grain
Nature of defect: Wrong information, lack of training, missing information, incomplete, not approved
Suggested action taken: 17, Ground for detention (tick box) (if the ship's stability for the next intended voyage is not assessed appropriately) 99 (if it is evident that the ship's stability for past voyages have not been assessed appropriately)
PSCOs are advised to refer to RULECHECK to decide on the appropriate convention reference.
Q3*- Does the ship comply with the stability criteria as applicable to the ship type?

The PSCO should check:

- for evidence of compliance with stability criteria, which could be from recent stability records or checking the current loading plan.
- When ship's stability information is appropriate and correct, the compliance may be confirmed by comparing ship's current loading condition with similar condition described in the information.

Intact stability criteria:

All passenger ships regardless of size and all cargo ships having a length of 24m and upwards shall comply with the intact stability criteria and those ships constructed on or after 01-July-2010 shall comply with the requirements of Part A of the 2008 Intact Stability Code. Please refer "Intact stability criteria" in definitions for more information.

Damage stability criteria:
Where a ship must comply with both intact and damage stability criteria it is essential that loading conditions are verified for compliance with both sets of criteria and not just those for intact stability. The following types of ships are required to comply with damage stability requirements:

Passenger ships
Cargo ships constructed on or after 01-Jan-2009 of 80m and more in length
Cargo ships constructed on or after 01-Jul-1998 of 80m and more in length
Cargo ships constructed on or after 01-Feb-1992 of 100m and more in length
Oil tankers, chemical tankers and Gas carriers

PSCOs should note that it is not necessary to verify compliance with damage stability criteria. It is only required to verify that ships which are required to comply with damage stability requirements use the damage stability booklet/ stability instrument incorporating the damage stability criteria.

Convention references:

Intact stability requirements:

ICLL Chapter I, Reg 1/ANNEX I/ Reg.27
SOLAS 2008 Amend, Ch.II-1, Reg.5-1 (S 74 Ch.II-1, Reg.19 / S 81 Ch.II-1, Reg.22)
SOLAS Ch.VI, Reg.9, Grain code Part A 7.
SOLAS 1988 Amend / Chapter II-1 / Reg. 22 (For ships constructed On or after 29-4-1990 Before 1-1-2009 – retroactive requirement)
SOLAS 2006 Amend / Chapter II-1 / Reg. 5 (for ships constructed On or after 1-1-2009 Before 1-7-2010)
SOLAS 2008 Amend, Ch.II-1, Reg.5.-1 (for ships constructed On or after 1-7-2010 Before 1-7-2020)
SOLAS 2017 Amendment (98th) / Chapter II-1 / Reg. 5 (for ships constructed on or after 1-7-2020)

Damage stability requirements:

Passenger ships :

SOLAS 1974 Convention / Chapter II-1 / Reg. 7 (passenger ships constructed on or after 25-5-1980 Before 1-9-1984)

SOLAS 1981 Amend / Chapter II-1 / Reg. 8 (passenger ships constructed on or after 1-9-1984 Before 29-4-1990)
SOLAS 1988 Amend / Chapter II-1 / Reg. 8.1(passenger ships constructed on or after 29-4-1990 Before 1-10-1994)
SOLAS 1991/1992 Amend / Chapter II-1 / Reg. 8 (passenger ships constructed on or after 1-10-1994 Before 1-7-1997)
SOLAS 1994/1995 Amend / Chapter II-1 / Reg. 8 (passenger ships constructed on or after 1-7-1997 Before 1-7-1998)
SOLAS 1996-1998 Amend / Chapter II-1 / Reg. 8 (passenger ships constructed on or after 1-7-1998 Before 1-1-2009)
SOLAS 2006 Amend / Chapter II-1 / Reg. 8 (passenger ships constructed on or after 1-1-2009 Before 1-7-2020)
SOLAS 2018 Amendment (99th) / CHAPTER II-1 / Reg. 8 (passenger ships constructed on or after 1-7-2020)

Cargo ships :

SOLAS 1989/1990 Amend / Chapter II-1 / Reg. 23-1 (cargo ships constructed On or after 1-2-1992 Before 1-1-2009)
SOLAS 1996-1998 Amend / Chapter II-1 / Reg. 25-1 (cargo ships constructed On or after 1-7-1998 Before 1-1-2009)
SOLAS 2006 Amend / Chapter II-1 / Reg. 5-1 (cargo ships constructed On or after 1-1-2009 Before 1-7-2020)
Deficiency code: 02134- Loading / ballast condition
Nature of defect: Insufficient
Suggested action taken: 17, Ground for detention (tick box)- in case the calculated stability condition for next intended voyage is not in compliance with the stability criteria.
99- In case the stability calculation records on the previous voyages are not in compliance with the stability criteria)
PSCOs are advised to refer to RULECHECK to decide on the appropriate convention reference.

Q4*- Is there evidence to show that the Master or responsible officer can determine the stability of the ship under varying conditions of service using the approved stability information provided on board?

The PSCO should check:

- whether the Master and the officer(s) responsible for cargo operations have received familiarisation training on carrying out stability calculations and in using the stability instrument (if applicable).
- whether the Master or the officer(s) in charge is/are familiar with the verification and calculation on ship's stability.
- whether the master has been supplied with stability information satisfactory to the Administration as is necessary to enable him by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service. (SOLAS74/ Ch.II-1, Reg.19 (a), SOLAS1981/ Amend/ Ch.II-1/ Reg.22.1,SOLAS 2008/ Ch.II-1,/Reg.5.1)
- whether the effect of free surface of partially filled tanks has been taken into account by the officer in charge correctly.
- All criteria shall be applied for all conditions of loading as set out in part B, 3.3 and 3.4 (IS code 2008, Part-A, 2.1.1)
- part B, 3.4 Standard conditions of loading to be examined
- For a cargo ship:
  1. ship in the fully loaded departure condition, with cargo homogeneously distributed throughout all cargo spaces and with full stores and fuel;
  2. ship in the fully loaded arrival condition with cargo homogeneously distributed

throughout all cargo spaces and with 10% stores and fuel remaining;
3. ship in ballast in the departure condition, without cargo but with full stores and fuel; and
4. ship in ballast in the arrival condition, without cargo and with 10% stores and fuel remaining.

Where the master or responsible officer is not able to understand the stability information and calculate ship's stability, detention may be considered.

Convention references:
STCW Code Section A-VIII/2, Part 5 (102.6)

SOLAS 1960 / Chapter II / Reg. 19 (for ships constructed before 25-5-1980)
SOLAS 1974 Convention / Chapter II-1 / Reg. 19 (for ships constructed On or after 25-5-1980 Before 1-9-1984)
SOLAS 1981 Amend / Chapter II-1 / Reg. 22 (for ships constructed On or after 1-9-1984 Before 29-4-1990)
SOLAS 1988 Amend / Chapter II-1 / Reg. 22 (for ships constructed On or after 29-4-1990 Before 1-2-1992)
SOLAS 1989/1990 Amend / Chapter II-1 / Reg. 25-8 (for ships constructed On or after 1-2-1992 Before 1-1-2009)
SOLAS 2006 Amend / Chapter II-1 / Reg. 5-1 (for ships constructed On or after 1-1-2009 Before 1-7-2020)
SOLAS 2017 Amendment (98th) / Chapter II-1 / Reg. 5-1 (for ships constructed on or after 1-7-2020)
Deficiency Code: 06107 (for cargo ships carrying cargo), 10133 (for passenger ships and for cargo ships on ballast)
Nature of defect: Def: Code 06107-Cargo operation- lack of training, Def Code: 10133- Bridge Operation- lack of training
Suggested action taken: 17, Ground for detention (tick box)
PSCOs are advised to refer to RULECHECK to decide on the appropriate convention reference.

Q5*- If the ship is provided with a Stability Instrument, is it approved by the Administration?

The PSCO should check:

- whether the stability instrument is approved by the Administration or a Recognised Organisation acting on behalf of the Administration.
- whether a document of approval for the stability instrument issued by the Administration has been provided on board, if applicable.

Explanatory notes:

An approved stability instrument is not a substitute for the approved stability booklet. The approved stability instrument is used as a supplement to the approved stability booklet to facilitate stability calculations.

The stability instrument is mandatory for:

a) all "oil tankers"; "oil tankers" constructed before 1 January 2016 shall install the stability instrument at the first scheduled renewal survey of the ship on or after 1 January 2016 but not later than 1 January 2021. For the purpose of the control under Reg.11, the Administration shall issue a document of approval for the stability instrument. (MARPOL 2014 Amend (66th) / Annex I / Reg. 28);
b) all "chemical tankers"; "chemical tankers" constructed before 1 July 1986 shall install the stability instrument at the first scheduled renewal survey of the ship on or after 1 January 2016 but not later than 1 January 2021 (BCH 2018 Consolidated Edition / 2.2).
"chemical tankers" constructed on or after 1 July 1986 and before 1 January 2016 shall install the stability instrument at the first scheduled renewal survey of the ship on or after 1 January 2016 but not later than 1 January 2021. For the purpose of the control under Reg.16

of MARPOL An.II, the Administration shall issue a document of approval for the stability instrument. (IBC / IBC 2014 Amend / 2.2).

c) all "gas carriers"; "gas carriers" constructed before 1 July 1986 shall install the stability instrument at the first scheduled periodical survey of the ship on or after 1 January 2016 but not later than 1 January 2021. (GC Code / 2.2).
"gas carriers" constructed on or after 1 July 1986 and before 1 July 2016 shall install the stability instrument at the first scheduled renewal survey of the ship on or after 1 July 2016 but not later than 1 January 2021. For the purpose of the control under Reg.4 of SOLAS Ch.XI-1, the Administration shall issue a document of approval for the stability instrument. (IGC 2014 Amend / Chapter 2 / 2.2).

d) "bulk carrier" of less than 150 m in length constructed on or after 1 July 2006 shall be fitted with a loading instrument capable of providing information on the ship's stability in the intact condition.

- For ships having a length of 24 m and upwards constructed on or after 1 July 2010 (SOLAS 2008 Amend / Ch.II-1 Reg.5.1, IS code Part A. Ch.2 / 2.1.6) a stability instrument is not mandatory but if it is being used as to supplement to the stability information book, it shall be approved by the Administration. In all other cases, a stability instrument may be used, but the approval by the Administration is not required. In such cases, the question should be answered N/A.

Convention reference:

SOLAS 2008 Amendments II-1/5.1
Intact Stability Code 2008, Part A, Chapter 2, 2.1.6,
SOLAS 2004 Amendments XII/11.2 (Bulk carriers of L < 150 m, KL ≥ 01.07.2006)
MARPOL 2014 Amend (66th) / Annex I / Reg. 28 (oil tankers)
BCH 2018 Consolidated Edition / 2.2 - IBC / IBC 2014 Amend / 2.2 (chemical tankers)
GC Code / 2.2 - IGC 2014 Amend / Chapter 2 / 2.2 (gas carriers)

Deficiency Code:	02103- Stability/strength/loading information and instruments
Nature of defect:	Not as required
Suggested action taken:	17, Ground for detention (tick box)

PSCOs are advised to refer to RULECHECK to decide on the appropriate convention reference.

Q6- If the ship is provided with a Stability Instrument, does the type of stability software in use meet the requirements for the relevant ship type?

The PSCO should check:

- whether the type of stability software in use is relevant to the ship type. This can be found from the user manual for the stability instrument

Explanatory notes:

The types of stability software applicable to stability instruments are given below.

Type 1: Software calculating intact stability only (for ships not required to meet a damage stability criterion)
Type 2: Software calculating intact stability and checking damage stability based on a limit curve or previously approved loading conditions
Type 3: Software calculating intact stability and damage stability by direct application of pre-programmed damage cases for each loading condition.
Type 4: Software calculating damage stability associated with an actual loading condition and actual flooding case, using direct application of user-defined damage, for providing operational information for safe return to port (SRtP). (at present only relevant to passenger ships)

Damage stability of both Type 3 and Type 4 stability software shall be based on a hull form model that is directly calculated from a full three-dimensional geometric model.

For tanker ships, only type 2 and type 3 stability software are acceptable.

Convention reference:

Intact Stability Code, Part A 2.1.6, 2.1.1 It is not applicable for a ship where the 2008 IS Code does not apply.
SOLAS Ch.XII Reg.11.3 (Bulkers), MARPOL An.I Reg. 28.6 (Tankers), IBC code 2.2.6 (Chemical tankers), IGC code 2.2.6 (Gas carriers))
SOLAS 2004 Amendments XII/11.2 (Bulk carriers of L < 150 m, KL ≥ 01.07.2006)
MARPOL 2014 Amend (66th) / Annex I / Reg. 28 (oil tankers)
BCH 2018 Consolidated Edition / 2.2 - IBC / IBC 2014 Amend / 2.2 (chemical tankers)
GC Code / 2.2 - IGC 2014 Amend / Chapter 2 / 2.2 (gas carriers)

Deficiency Code:	02103- Stability/strength/loading information and instruments
Nature of defect:	Not as required, Not approved
Suggested action taken:	17, 16

PSCOs are advised to refer to RULECHECK to decide on the appropriate convention reference.

Q7- Is there evidence on board to show that the master/loading officer confirms that the "calculated" displacement and trim corresponds with the "observed" draughts?

The PSCO should check:

- that the ship staff are verifying that the calculated displacement and trim corresponds with the actual observed draughts. This can be ascertained by the PSCO by checking the previous stability calculation record and draught record on the ship's logbook, voyage plan or so on. (if available). The PSCO can request the Master/Chief Officer to calculate the displacement at the time of the inspection and verify whether the observed draughts correspond with the calculated displacement.
- that the draught marks are marked clearly at the bow and the stern.

Explanatory notes:

Every ship shall have scales of draughts marked clearly at the bow and stern. In the case where the draught marks are not located where they are easily readable, or operational constraints for a particular trade make it difficult to read the draught marks, then the ship shall also be fitted with a reliable draught indicating system by which the bow and stern draughts can be determined.

This application of this requirement is as follows;
- All passenger ships (1988 amendment by Res. MSC12(56))
- Cargo ships constructed on or after 1 Jan. 2009 (2008 amendment by Res. MSC216(82))

The ships other than the above are not required mandatorily to mark the scales of draught. However all ships are required to record the draught before commencing the voyage by , SOLAS Ch.V, Reg.28.1 and Res.A.916(22).

Res.A893(21) "Guidelines for voyage planning" Annex 2.1.1- the condition and state of the vessel, its stability, should be considered in voyage and passage planning. SOLAS Ch II-1Reg. 5.6 requires ships to be fitted with reliable draught indicating system if the draught marks are not easily readable.

Convention References:
None

Deficiency Code: None
Nature of defect: -
Suggested action taken: -
(This question is for information/data analysis purposes only. No deficiency should be assigned if the question is answered "No". We also feel that there are no appropriate convention references that pertain to this question as most convention references apply only to the marking of draughts on ships.)

Q8- If the ship is provided with a Stability Instrument has the accuracy of the stability instrument been verified periodically by applying at least one approved test condition?

The PSCO should check:

- whether the accuracy of the stability instrument has been verified by applying at least one approved test condition and that the results show that the stability instrument is accurate and reliable.

Explanatory notes:
The verification of the accuracy of the instrument is provided in Part-B of IS code 2008, as a recommendation.
"Part B / 4.1.9.1 It is the responsibility of the ship's master to check the accuracy of the stability instrument at each annual survey by applying at least one approved test condition."
Tankers are also required to refer to this recommendation on each regulation or code. Bulker of less than 150 m in length is required to be provided with standard condition for testing purpose, but the implementation of the periodical test is not required clearly in the regulation (SOLAS Ch. XII Reg.11.3)
Therefore, where this question is answered NO, deficiency shall not be pointed out. This question is treated for the statistical information purpose.

Convention reference:

Intact Stability Code, Part A 2.1.6, B 4.1.9
SOLAS Ch.XII Reg.11.3 (Bulkers), MARPOL An.I Reg. 28.6 (Tankers), IBC code 2.2.6 (Chemical tankers), IGC code 2.2.6 (Gas carriers))
SOLAS 2004 Amendments XII/11.2 (Bulk carriers of L < 150 m, KL ≥ 01.07.2006)
MARPOL 2014 Amend (66th) / Annex I / Reg. 28 (oil tankers)
BCH 2018 Consolidated Edition / 2.2 - IBC / IBC 2014 Amend / 2.2 (chemical tankers)
GC Code / 2.2 - IGC 2014 Amend / Chapter 2 / 2.2 (gas carriers)
SOLAS 2018 Amend (99^{th}) Chapter II-1/Reg. 8.1.3.1

Deficiency Code: None
Nature of defect: None
Suggested action taken: None

(This question is for information/data analysis purposes only. No deficiency should be assigned if the question is answered "No".)