PAP 26 Discussion paper

Agenda item 8.6

Software Quality Assurance

# Summary

This paper notes that Software Quality Assurance (SQA) is fundamental to the success of e-Navigation. It recognises that IMO is committed to preparing guidelines on SQA, but that these are likely to be directed at onboard equipment and systems. It is proposed that IALA should produce its own requirements for onshore systems SQA, for possible submission to IMO

## Purpose of the document

PAP is invited to note that SQA is included in the proposed Work Program for the successor committee to e-NAV.

## Related documents

1. NAV 59/WP8 – Report of the Working Group on e-Navigation
2. NAV 58/6/4 - Consideration of software quality assurance issues for e-Navigation development Submitted by the Republic of Korea
3. e-NAV13/45 – Software Quality assurance for Onshore Systems submitted by Yves Desnoës
4. e-NAV 13/40 - Software Quality assurance for Onshore Systems submitted by Nick Ward

# Background

Software Quality Assurance (SQA) has been recognized by the NAV sub-committee of IMO (NAV 58/WP.1) as an important element of e-Navigation and NAV 59 agreed that guidelines on SQA should be developed as part of the Strategy Implementation Plan for e-Navigation.

As e-Navigation covers shore systems as well as ship systems, SQA impacts directly the activities of IALA and of its members. It is therefore appropriate for IALA to consider development of guidelines for onshore systems. This task is included in the future Work Program for the successor committee to e-NAV.

# Discussion

Software may be found in all solutions of e-Navigation and in many other navigation-related systems. Dependence on software will increase with automation and with inter-connectivity, characteristics which tend to decrease reliability. If software quality is not ensured then e-Navigation will not achieve its objectives. The cost of improving it later will be far higher than dealing with it from the start.

SQA is essential in the development, verification and maintenance of software. The conditions and requirements may be different aboard and may be adapted to the characteristics of the various systems. However, SQA requirements for shipborne systems and for onshore systems should be coherent: for instance, the need for high reliability of information onshore should correspond to such a need on-board.

SQA requirements for onshore systems should not be assumed to be identical to those for shipborne systems. IALA and IALA members are best placed to produce such requirements for onshore systems.

# Potential solutions

Software quality is covered by two related multipart International Standards: ISO/IEC 9126 (Software product quality) and ISO/IEC 14598 (Software product evaluation). The ISO 25xxx series has been created to provide a logically organized and unified series covering two main processes: software quality requirements specification and software quality evaluation, supported by a software quality measurement process.

ISO 25010 deals with Software Quality Models and is necessarily of a general, high-level nature. However, it contains material that could be useful in discussions about the software quality requirements for e-Navigation. In particular, sections concerning quality models and measurement, user requirements, terms and definitions could provide useful references.

Consideration should also be given to:

* Compatibility with quality standards for shipboard systems
* Compatibility with the IHO S-100 Data Model
* Current IMO eNav CG work being done on ‘Usability and Software Quality’

# Action requested of PAP

PAP is invited to note the proposal to develop guidance on Software Quality Assurance.