SOLAS Regulation V/15

1 SHORT FORM TEMPLATE FOR MINOR CHANGE

This document illustrates how the template may be applied to a change that is relatively minor, e.g. the introduction of a new item of equipment, a minor change to ship operations or a limited change to manning.

If there is existing documentation that answers the questions in this template, then refer to it rather than produce duplicate material.

DISCLAIMER

Use of any knowledge, information or data contained in this document shall be at the user's sole risk. The members of the ATOMOS IV Consortium accept no liability or responsibility, in negligence or otherwise, for any loss, damage or expense whatever sustained by any person as a result of the use, in any manner or form, of any knowledge, information or data contained in this document, or due to any inaccuracy, omission or error therein contained.
The European Community shall not in any way be liable or responsible for the use of any such knowledge, information or data, or of the consequences thereof.

1.1 Scope of change – to be completed by the person requesting the change, e.g. ship manager office, owner representative, superintendent

a/ What is to be changed? (tick all that apply)

Equipment   AIS   Manning   Procedures   Layout

b/ Specific change to be made
All: fit antenna, cabling, interfaces. Add pilot plug
MKD: Add Control Display Unit near conning position.
ECDIS/ARPA: No extra units near conning position

c/ How can this change be used to improve safety and effectiveness?
AIS can improve collision avoidance and situation awareness. It can reduce VHF voice traffic.

d/ What is the objective of the change?
Regulatory compliance.
Security requirements.

e/ Is this change something that is established and common?   Yes   No X

f/ Has it been checked that any issues raised when this change was made before have been addressed this time?   Yes   No

Because this is new, there is no likely to be in-house experience to draw on (using the SMS). Nothing in MARS. External sources e.g. the internet were used to identify any current issues. Issues have been noted e.g. uais.org and from conferences (e.g. RIN). Issues of head down, overload, distraction, inconsistent symbols. "VHF madness", talking to pals, making private arrangements. Temptations of dependence on AIS would risk safe lookout (by assuming that all ships have working AIS) and increase in speed considered safe.

No specific objections to MKD have been found searching the web but the RIN survey showed that it was strongly rejected by mariners. A (slight) preference for putting AIS on ARPA rather than ECDIS was found. ICS recommends the integrated solution over MKD and points out the distraction hazard of MKD.

Novelty and speed of introduction must raise some risks in itself, as must the rapid increase in purposes.

If yes to e/ and f/, then no Human Hazard Assessment is required. Go to section 1.3

1.2 Human Hazard assessment

To be completed by an owner's representative before the change is introduced if the change is novel.

a/ What is the impact of the change on performance – what aspects of performance will be affected?
Better traffic management. Better collision avoidance. Better routing through busy areas. No impact on safe speed. No impact on COLREGS.

c/ What hazards might it create - by itself or if something else goes wrong. For each of the items below, record any issues that may become hazardous if not addressed.

Training and human hazards
Does safe and effective operation depend on specific training?
Would there be a problem if people did not have specific training or experience?
Will new training be required to achieve safe and effective operation?
Yes, to all the above for all versions of AIS. Training in installation, maintenance, operation, and (revised) navigation tasks all essential to safe and effective operation.

Operations and human hazards
Does safe and effective operation depend on the correct procedures being available and being followed?
Yes, particularly for MKD (and this, particularly with early ARPA/ECDIS that cannot take an integrated fit).
Is there a need for new procedures?
Additional routine maintenance, system integrity checks.
New drills for resolving conflicts or ambiguity between AIS and other bridge resources, and drills for data fusion. Use of Long Range Function. Use of ATON. Use with GMDSS for distress signals.
Are there particular procedures that will be affected?
Use of bridge resources for collision avoidance and for safe navigation.
Are there some circumstances where the change means that a slip or lapse could be hazardous (perhaps in conjunction with a technical failure)?
Yes, incorrect data or status settings. Not noticing GPS failure or other input problem. Misinterpreting symbols or labels, particularly if they are different

between the AIS and the other bridge equipment.
Will the change increase fatigue?
No, might reduce it – unless MKD needs to be operated for extended periods.
Will the change cause communication difficulties?
Should simplify VHF communications.

Equipment and human hazards
Might the equipment introduce additional workload, distraction or confusion?
Yes, all versions of AIS do this. MKD definitely introduces this problem.
Is it vital to know the status of the equipment and its operation?
Yes, for safe navigation and for security.
Might incorrect operation be hazardous?
Yes.
Would (partial) equipment failure pose a risk?
A security risk. Also a navigation risk if other ships depend on ownship AIS functioning. (Partial) failure of inputs would result in incorrect information being used by other ships.
Does the change require changes to support e.g. documentation, supervision?
Operating documentation and training documentation needed.
Supervision to ensure that distraction is avoided, and that AIS is not depended on too much. Use of safe resource management will require supervision as it is new.
Is the equipment known to meet ergonomic criteria (from reply to information

request)?
The IMO Guidelines (217, 227) specify symbols, but no other ergonomic criteria. Criteria would have to be specified in request for information.

SCC layout and human hazards
Might the change affect access and safe movement round the bridge?

Not likely.

Interfere with watchkeeping at day or night (view, reflections, light sources etc.)?

Possibly. Backlit screen near conning position could interfere. Avoiding this problem, and screen legibility, not specified in IMO Guidelines 217, 227.

Interfere with specific procedures?

Location of Pilot Plug will need to match procedures. Otherwise no impact.

Worsen the environment or housekeeping?

No

1.3 Information required from supplier of new equipment

For changes involving new equipment, do the manufactures supply:

Procedures

A description of the training required for the safe and effective operation of this equipment.

Suppliers vary in installation and operating training provided. No clear recommendations seen from suppliers or regulators.

A procedure for seagoing users to contribute feedback on usability issues.

None mentioned in literature seen.

Controls and indications.

a/ evidence that the information which is presented in a clear and unambiguous manner, using standardized symbols and coding systems for controls and displays.

Only symbology is specified. The various types of information to be displayed has established formats. System control and display is known to be variable. No specific evidence of legibility.

b/ evidence that the grouping and layout of controls and displays meets ergonomic criteria.

MKD devices have many different user interfaces. No evidence of ease of use for any of them. No real indication of how integrated devices integrate, particularly as regards data fusion/deconfliction.

c/ status indication, description of the operational states and their indication, together with information on the consequences of these states for safe and effective operation.

This may be a risk area.

d/ alarms, which alarms are necessary and/or provided, together with how are these categorized (e.g. emergency alarms) and the actions necessary following an alarm.

Alarm implementation is variable. No guidance on clarity of alarm messages and – as yet – no established actions in the event of (partial) failures.

e/ essential information, what part of the presented information is essential for safe and effective navigation under all conditions.

The information is not supposed to be essential.

Installation guidance.

Information necessary to ensure that the equipment is installed so that it can be operated safely and effectively.

Antenna siting information is given, but guidance may be difficult to apply to the specific situation of a particular ship. Proper end-to-end testing may not be easy (depending on facilities).

Manuals and documentation.

Description of the documentation necessary for safe and effective operation, and the languages in which it is available.

There is IMO guidance on operational use.

1.4 Checklist for introduction of new bridge equipment and systems: to be completed by the Ship's bridge team

Pre-installation checks

Check that the location will be satisfactory as regards:

a/ Interference with lookout and watchkeeping

b/ Potential for distraction at either day or night

c/ Access and movement round the SCC

Trip hazards, head bangers, snagging hazards

Use of related equipment

Allowing access to other bridge equipment and bridge windows

a/ Reach and view of controls and displays on the equipment

b/ Access to communications/ telephones

c/ Maintenance access

Difficulty of installation depends on how many add-on boxes have had to be put there already.

Post-installation checks

External view and watchkeeping satisfactory?

Access and movement round the SCC safe?

Equipment sited in a suitable location?

Training needs identified?

Is the cable installation secure including any external cabling?

Are the cable seals/glands sound (for cable penetrations)?

Are any peripherals, e.g. data transfer devices, recorders, connectors, batteries (as applicable) sufficiently robust and accessible?

Are stowages for manuals in a suitable location?

Are all necessary warning signs, instruction notices etc. in place?

Are the procedures for calibration, software version control, system set up, and system management (as appropriate) easy to follow?

Are the procedures for fall-back operation e.g. following equipment complete or partial failure easy to follow?

Are the health and safety arrangements satisfactory e.g. non-slip surfaces, grab handles?

Is the fuse panel in a suitable location for making isolations?

Is a power supply change over switch required? Is it sensibly located?

Operating checks

Fatigue and work patterns safe?

Operating procedures established as safe and effective?

Management and supervision safe?

Equipment easy to use?

Indications clear and easy to read (day and night?

Indications consistent and easy to understand?

Equipment not prone to human error?

Status and feedback easy to understand?

No problem with reflections?

Audibles clear and not distracting?

Documentation easy to understand?

Fallback and failure modes can be handled?

Initial training implemented and achievable?

Continuation training implemented and achievable?

Bound to be somewhat experimental at this stage.

1.5 ALARP summary and residual risks to be managed

a/ Are there any issues or risks that still need to be addressed?

Proving the training is adequate.
Proving that the procedures and resource management is safe and effective under all conditions.
Ensuring that people do not become dependent on it to the detriment of lookout and use of radar iaw COLREGS.

b/ Are there further changes that could be made that would be cost-effective improvements to safety?