

Distributed Navigational Alert Management

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ABSTRACT: The team of authors is engaged in the IMO corresponding group on INS/Alert Management and in national task groups primarily specialising in “Navigational Alert Management” matters.

This presentation is based on the outcome of serious discussions carried out at different work group sessions in Germany and has been widely used as a guideline when details of an Alert Management concept are analysed (e.g. alert related communication and de-escalation strategies).

A separate paragraph of definitions within this presentation describes “Function Alerts” which are not relevant for the navigational tasks carried out by the officer of the watch. Alerts appear to be nonrelevant because the subject under discussion whether their announcement should be automatically filtered out by a navigational module within an INS. This could be one effective method of resolution to minimise (the number of high priority) alerts.

1 PRESENTATION OF A CONCEPT OF A DISTRIBUTED ALERT MANAGEMENT START OF PRESENTATION ON NEXT PAGE

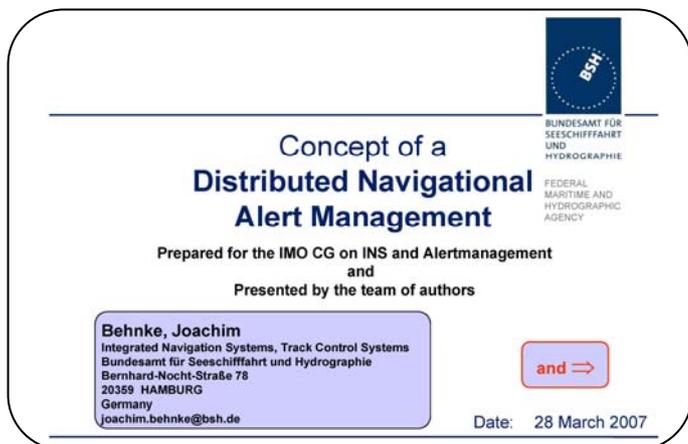


Fig. 1. Introduction of the authors

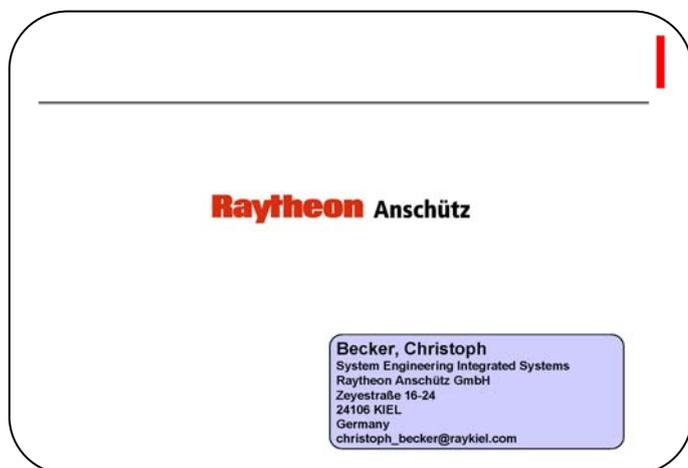


Fig. 2. Introduction of the authors

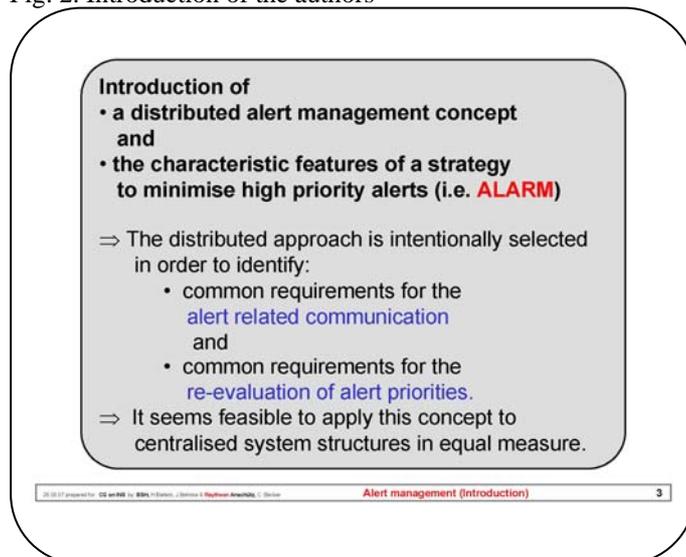


Fig. 3. Introduction of the subject-matter

Alerts on the bridge should be minimised

The purpose of an alert management

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Fig. 4. The purpose of an alert management

Examples of "advanced knowledge" from functional integration:

- concepts for integration of functions inside operation mode modules
- redundancy concepts inside INS

Module "Steering"

multi-sensor evaluation, ... e.g. module "Positioning"

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Fig. 7. Results of investigations

The logical architecture of the alert management and the handling concept for alerts should provide the capability to minimise the number of alerts especially those on a high priority.

General requirement for an alert management

⇒ This can be achieved by generating and using "advanced knowledge" as a result of

- information integration and
- functional integration

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Fig. 5. Results of investigations

Examples of "advanced knowledge" from information integration:

- the present navigational situation
- the operational mode in use
- the navigational functions in use
- the essential navigational data required for each individual mode or function (in use)

open sea, confined waters ...

Heading Control, Track Control ...

target detection, collision avoidance,

Heading, Position, Speed Through Water, Speed Over Ground ...

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Fig. 6. Results of investigations

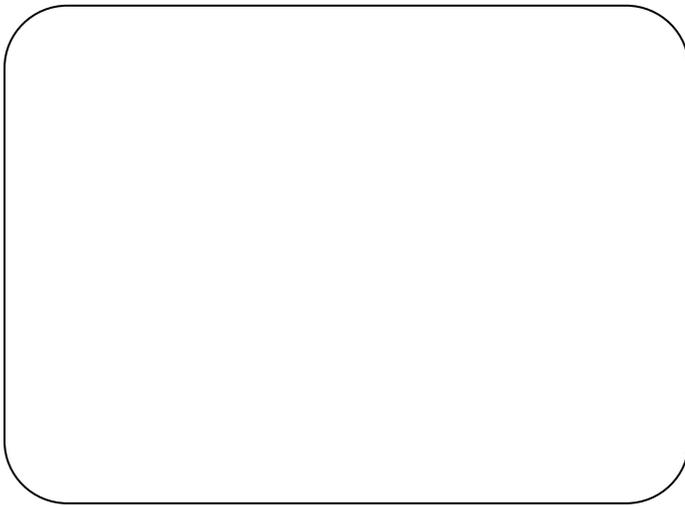


Fig. 8. Results of investigations

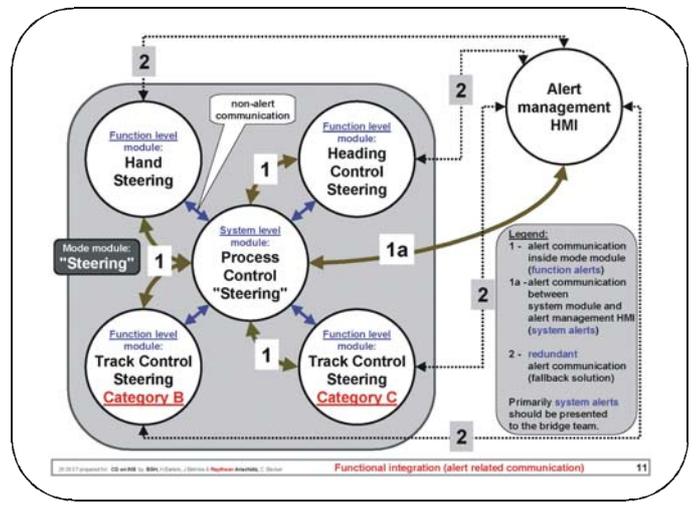


Fig. 11. Functional integration

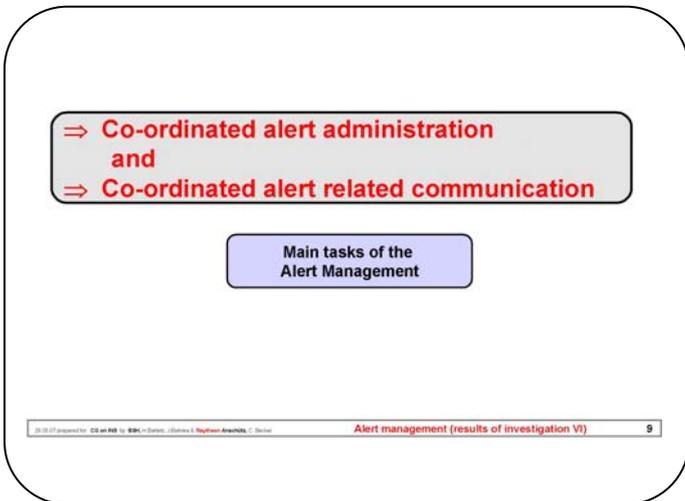


Fig. 9. Main tasks of the Alert Management

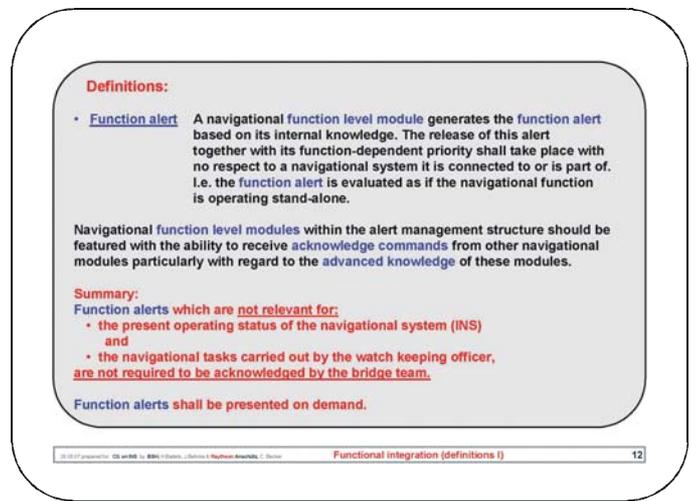


Fig. 12. Functional integration

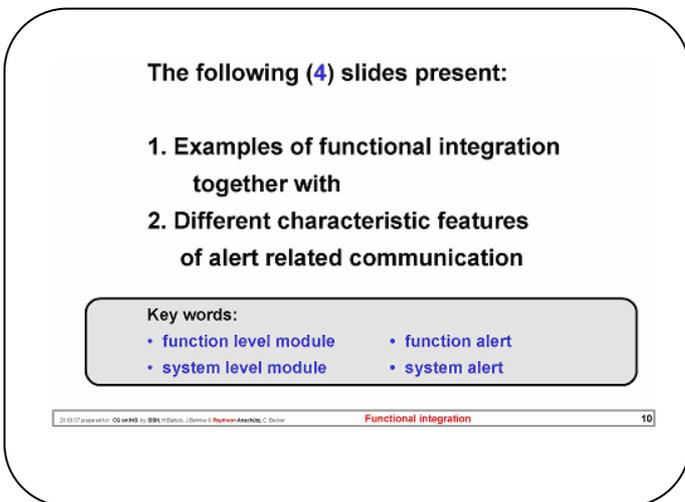


Fig. 10. Functional integration

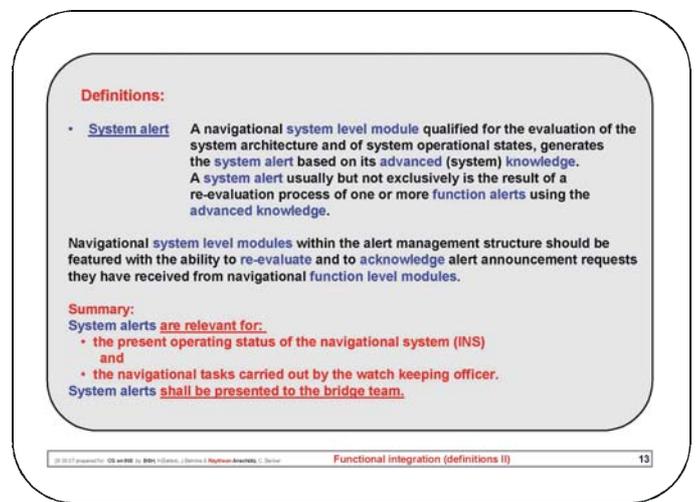


Fig. 13. Functional integration

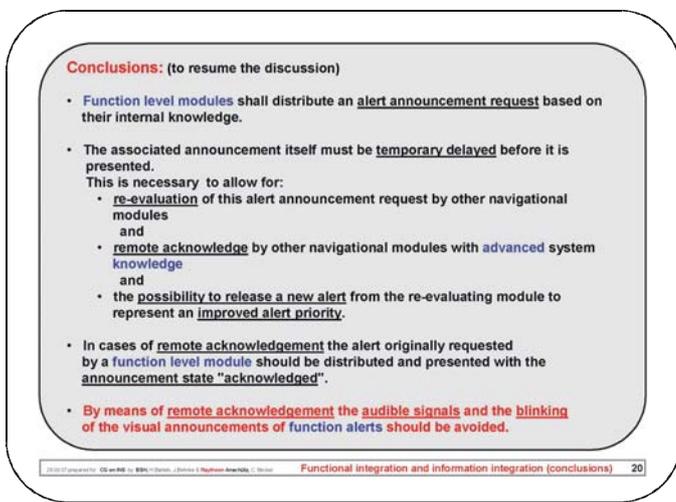


Fig. 20. Conclusions to resume the discussion

1.1 Conclusions

It appears feasible to minimise the number of alerts especially those on a high priority.

The conceptual design supports the implementation of “Function Alerts” and “System Alerts” and the capability of navigational system level modules to acknowledge “Function Alerts”.

Easily manageable alert related communication will be supported by this concept.

This presentation is a condensed version of an Alert Management concept based as a full version on different series of slides dealing with topics like “State Monitoring”, “Alert State Transitions”, “Alert Announcement State Transitions”, “Escalation Strategy” (to handle unacknowledged alerts),

“Deescalation Strategy” (to minimise the number of high priority alerts) and “Consistency of Alert Presentation within a Navigational System”.

German workgroups deal successfully with these series of slides as a “starting point” whenever they plan to recommence discussions on related matters.

Additionally the slides are applied as a “toolbox” useful to align the picture of an Alert Management Structure in the mind’s eye of each member of a working group during discussions.

These series of slides are especially suited to mediate between the generic requirements laid down in the Performance Standards and the “Operational and Performance Requirements” to be implemented in IEC’s International Standards.