



Tomorrow's Navigation Today!

The Design of Modern Ship's Bridges

Copenhagen, Denmark, November 2000

Human-Machine Interface – ECDIS in Context?

Erik Styhr Petersen

R&D Manager, Danish Maritime Institute

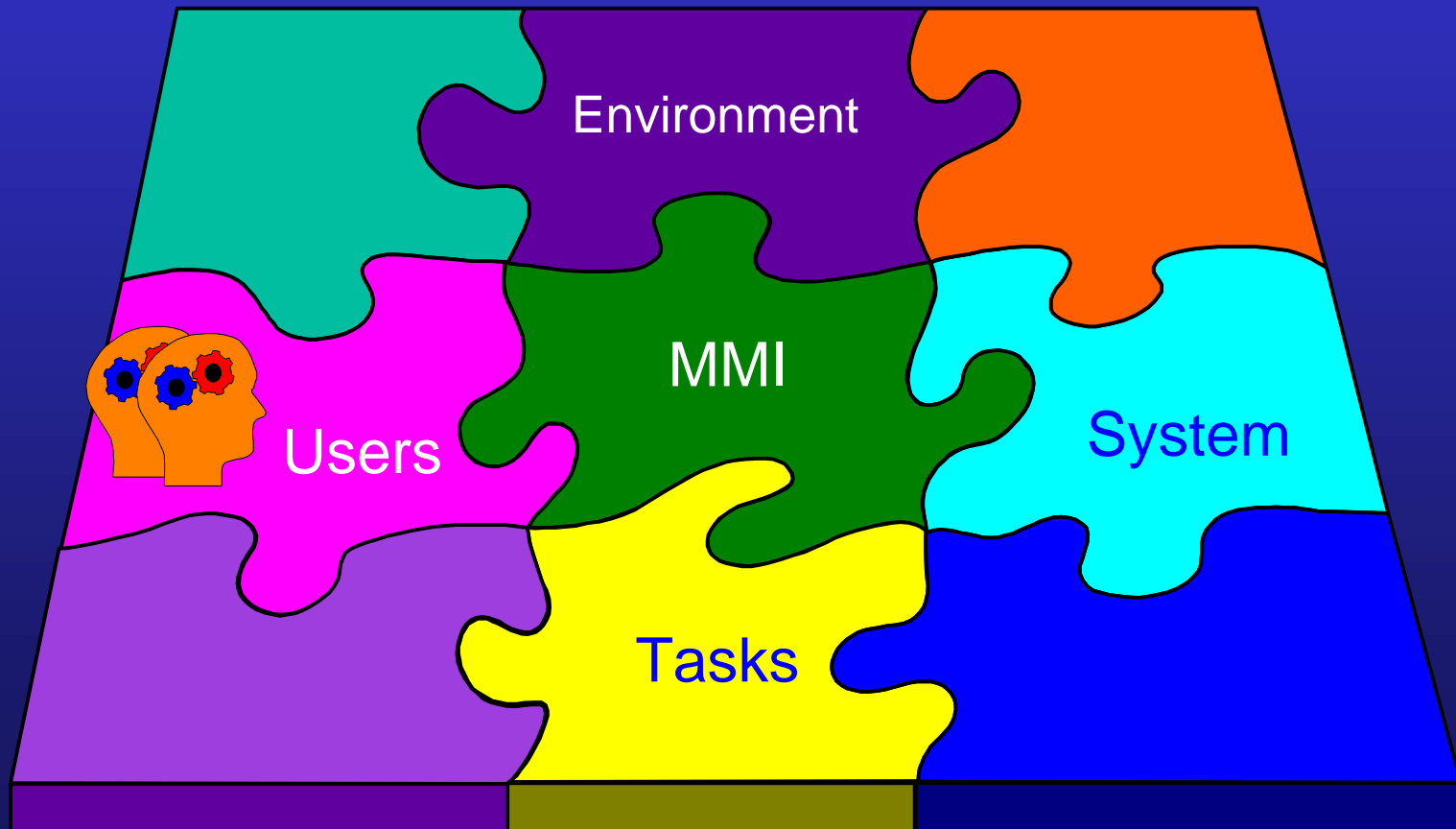
ATOMOS IV Project Manager

Presentation Overview



- Bridge Operations – a Jigsaw Puzzle;
- ECDIS – a few words of caution;
- Potential improvements in bridge design;
- Ways of achieving improvements.

The 'Bridge Operations Jigsaw Puzzle'

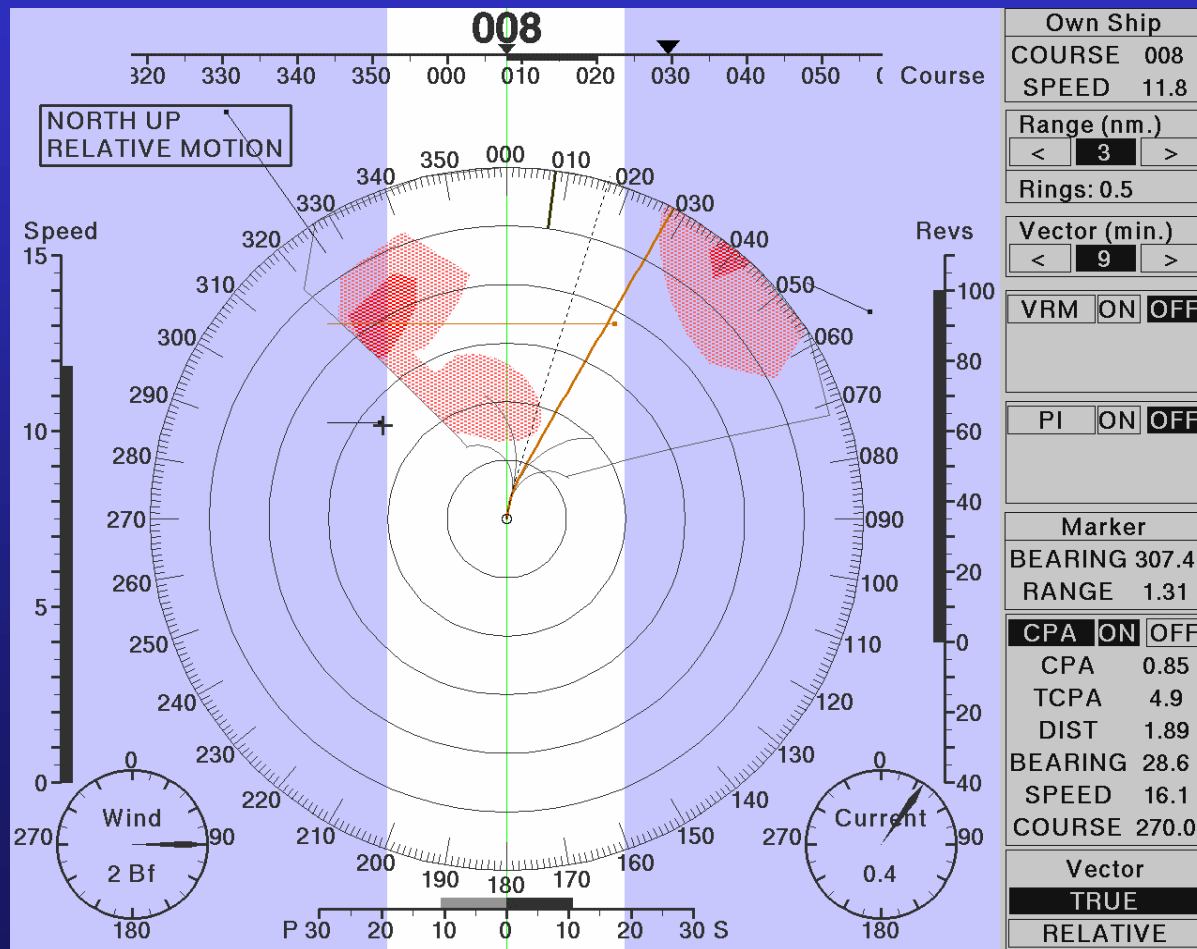


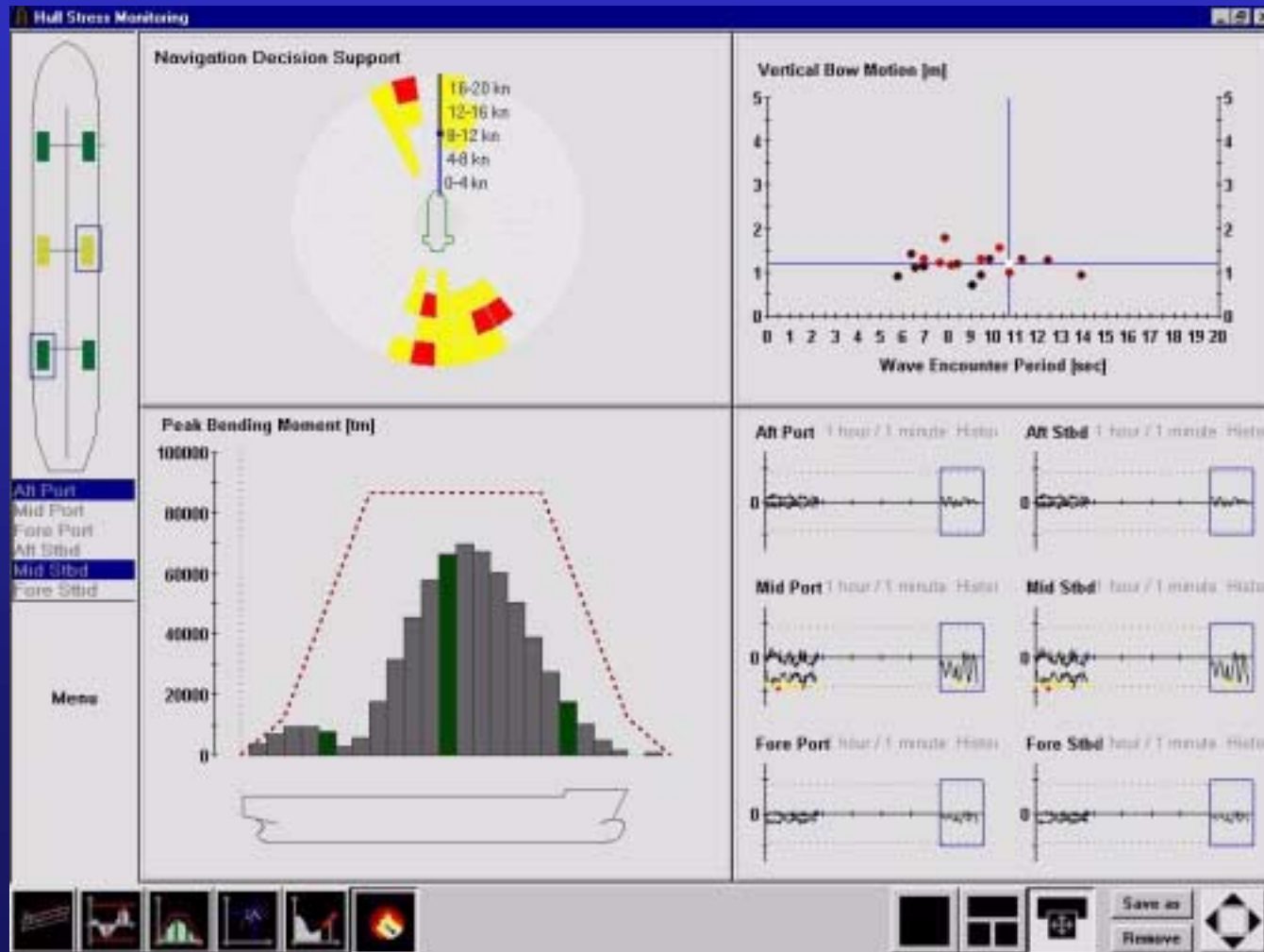
A few words of caution?

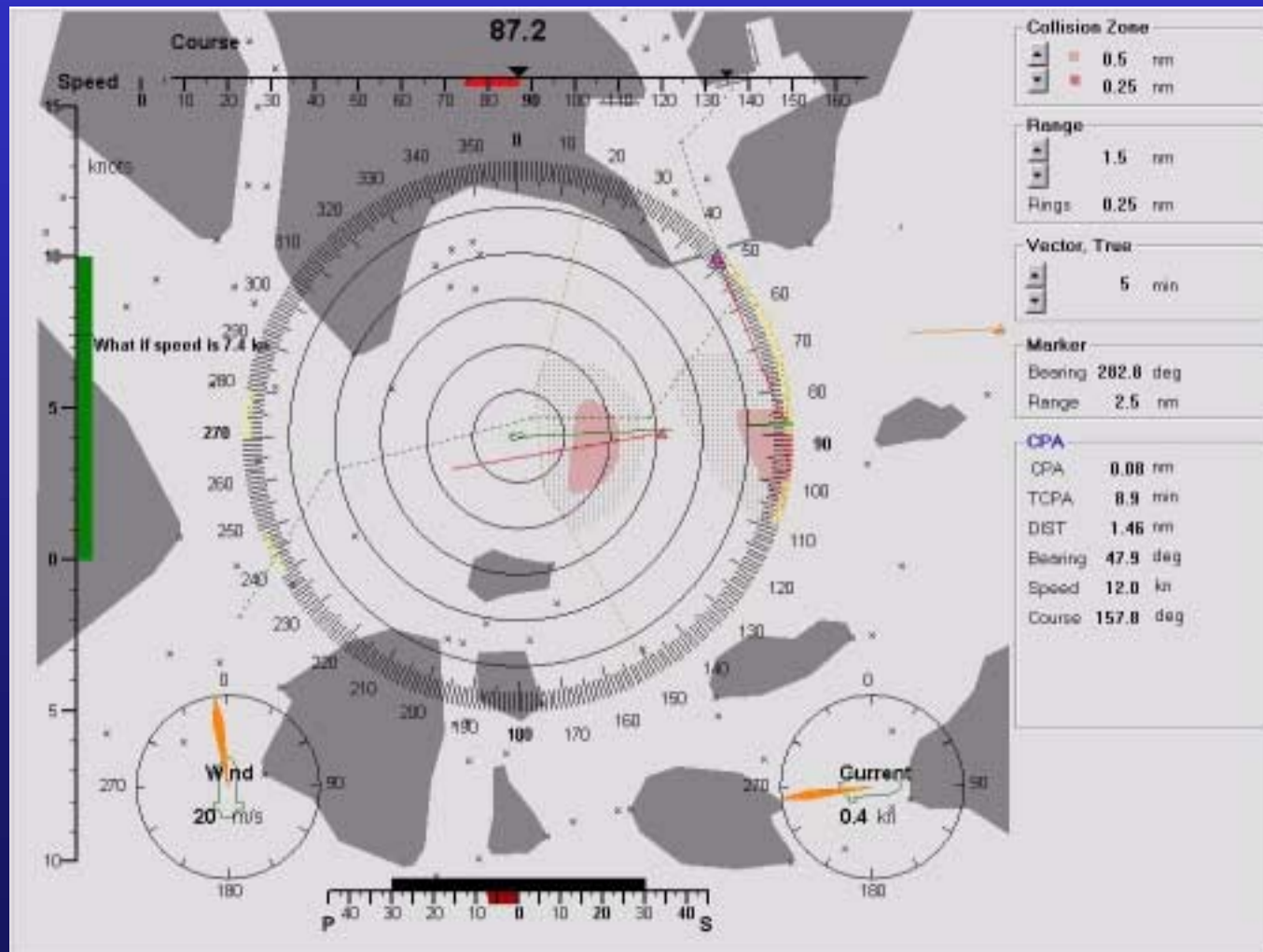


- During the course of a number of DMI Human Factors projects, it has become clear that current bridge design and instrumentation (perhaps) can be improved...
- – and hence that ECDIS should not be considered as stand-alone.
- The codeword in improvements is most likely 'Human Centred Design'...
- Examples?
- Proof?

HCD Example: ATOMOS Tactical Display





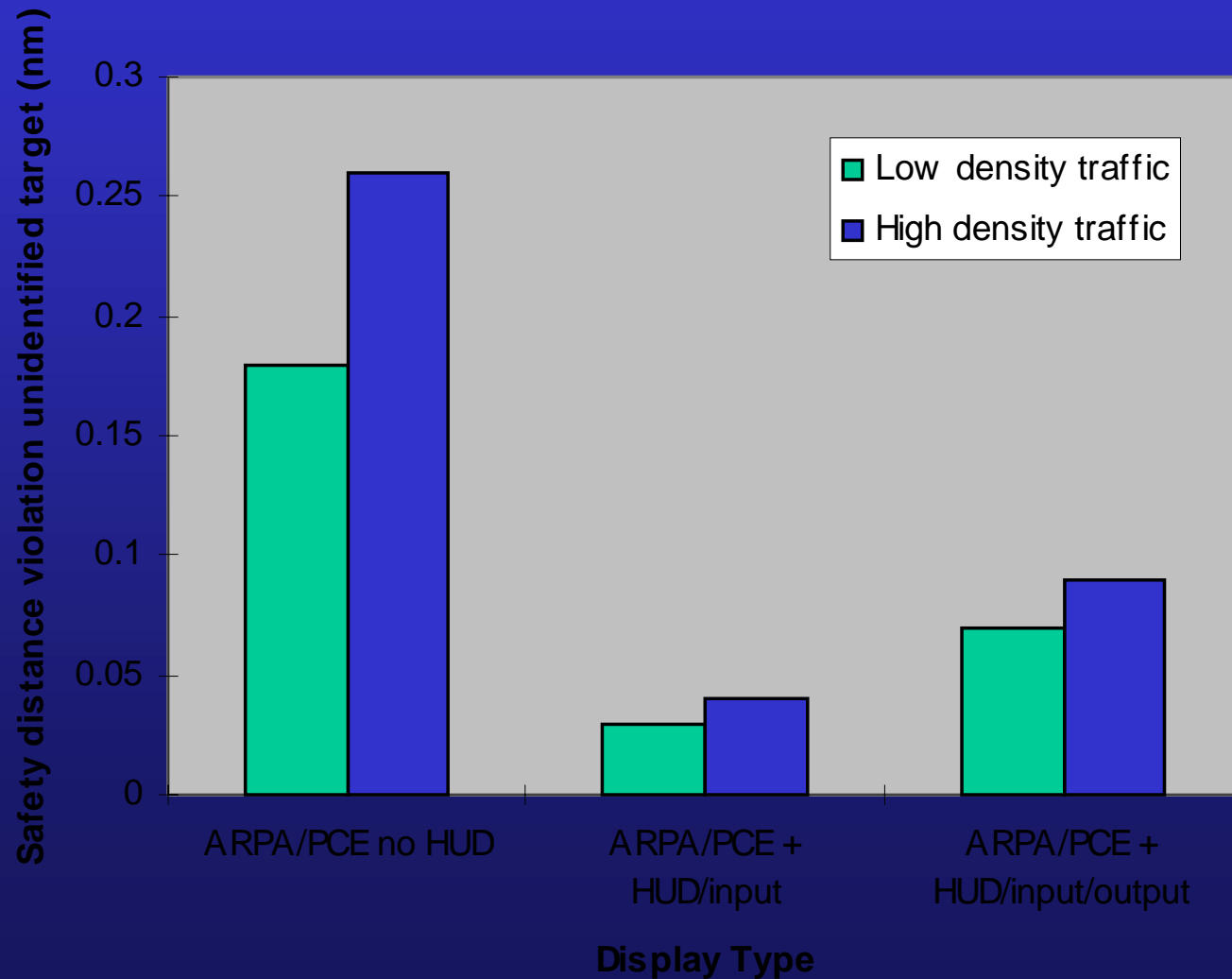


Proof...in three phases...

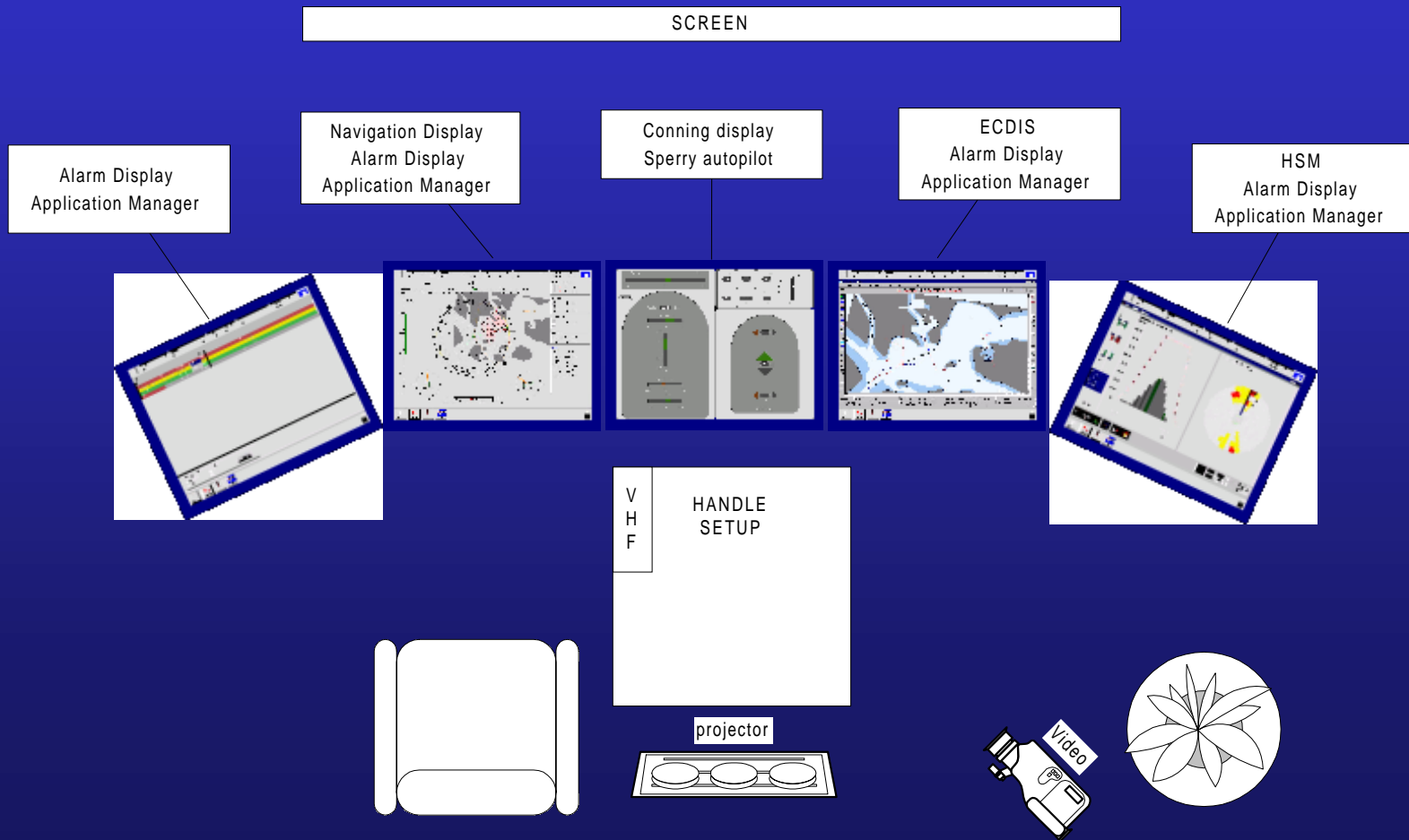


- Question: Does Human Centered Design really improve on things?
- Yes - Measurable, positive impact - 'proof' – in three parts:
 - Part Task Testing of Developed Key Displays
 - Full Mission Testing of Integrated Solution
 - Independent Analysis of Risk

Part Task Testing



Full mission testing (i) – Set-up

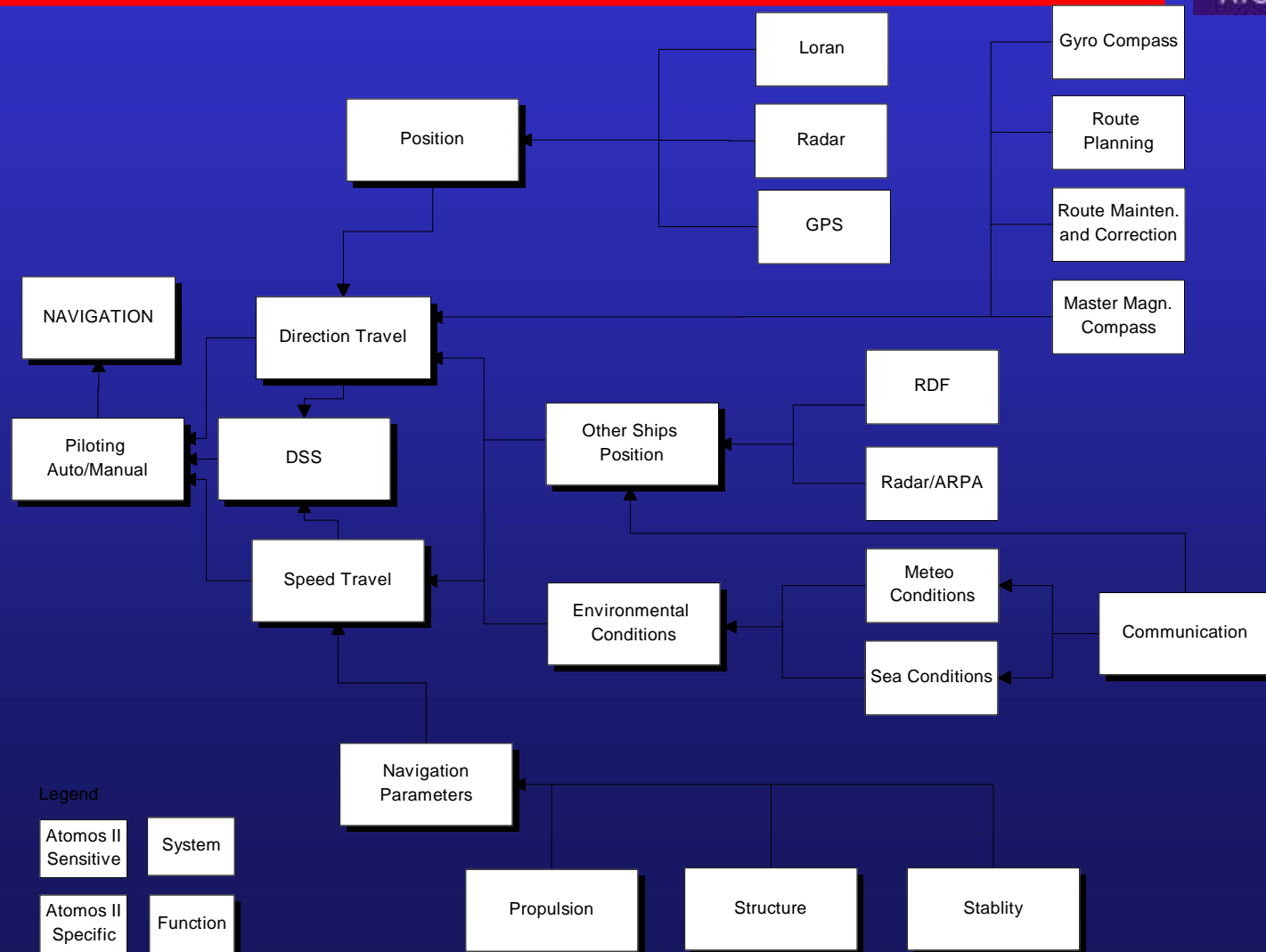


Full Mission Testing (ii) - Main Results

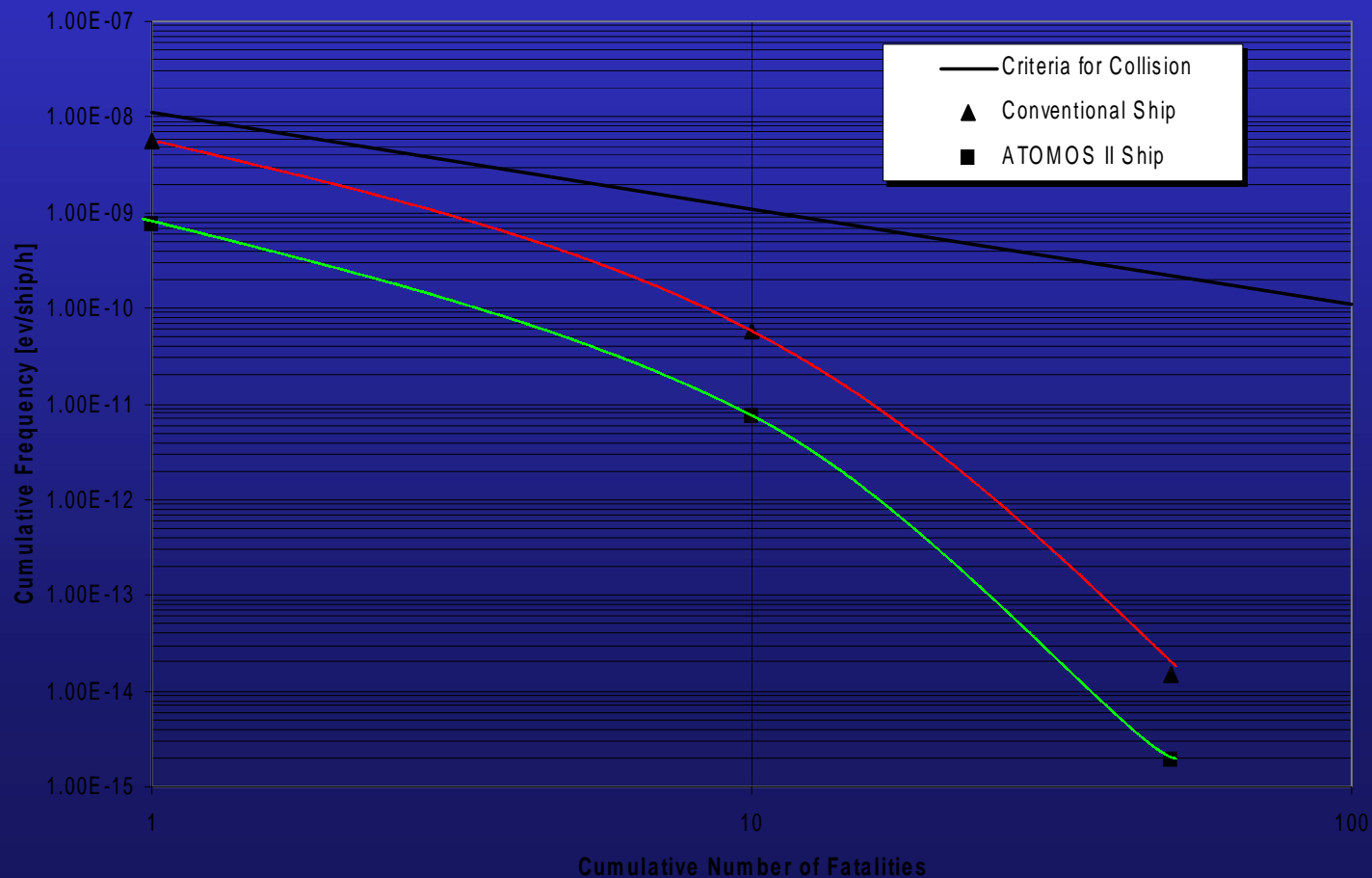


- Subjective Results: Users very satisfied with using the ATOMOS ISC system;
- Objective Results: After 1 hrs. of training, users performed objectively just as well as on a conventional system where they are highly experienced;
- Overall indication: Given similar experience, great improvement in performance expected (as compared to conventional systems).

Independent Risk Analysis (i)



Independent Risk Analysis (ii)



How to achieve improvements?



- Through the application of the ATOMOS Conceptual Standard for Ship Control Centre Design:
 - Optimised for Safety;
 - Optimised for Efficiency;
 - Optimised for Ergonomics;
 - Validated by Simulator Trials;
- Documents currently under submission to ISO/IEC.

SCC Design Standard Main Contents



- **Concept and General Principles**
 - The SCC in context
- **Lifecycle Issues for SCC & HMI**
 - Development of Complex Computer-based Systems
 - Safety Lifecycle
 - Human Centred Lifecycle
- **Guidelines for Maritime Human Centred Design**
- **Advice on SCC Layout**
- **Advice on Workstation Design**
- **Advice on HMI Dialogue**
- **Annex A - Example of Safety Assessment Model (Informative)**
- **Annex B - ATOMOS II Style-guide (Informative)**
- **Annex C - Associated Work Products (Informative)**
- **Annex D – Example of conceptual Bridge layouts (Informative)**
- **Bibliography**

Moving towards real life: Target Ship



More information



- Main source: www.atomos.org
- Project Manager: esp@danmar.dk

Or partners directly:

