E-navigation underway

Have we addressed Human Element user needs?
Maritime Human Factors

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Shaping ships for people
Human Element

• The Humans
  – Crew; deck AND engine…
  – VTS
  – Pilots
  – Etc…
  – Parts of a socio-technical system
Need vs. want

“Customers sometimes do not know what they want. It can be dangerous to just listen to what users say they need.”

JOHN SEELY BROWN, co-chairman of the Deloitte Center for Edge Innovation, a research and consulting organization in Silicon Valley.
“I want my dog in the background”
Relevant information

It’s about asking the right questions

• **What do you want?**
  – Seafarers are not designers, programmers etc

• **What do you need?**
  – Tell me about your job and how I can support it
Studies show: all maritime users need

• Overview – joint SA
• Communication
• Reliable systems/information/sensors
  – Reliable: consistently safe
• Trust: social and technical

• All high-level concepts – no silver bullet
Relevant = want or need...or “can do”?

• “Makes key information available”
• “…permanently providing valid information on the operation of ship systems”
• “…a consolidated picture of pertinent navigation information…”
• “Innovative concentration of navigational data”
• “…everything is also more graphically, more clearly and in a more modern way displayed”
Factors contributing to failure

- Situations requiring rapid response
- Challenge of managing concurrent tasks
- Equipment failure and design flaws
- Misleading or missing cues normally present
- Plan continuation bias
- Stress
- Shortcomings in training and/or guidance
- Social/organizational issues

Dismukes, Berman, Loukopoulos
Design and then train?

- STW Sub Committee in May 2012: ECDIS Model Course…less than 40 hours including robust evaluation will not meet STCW requirements.

- ‘basically, the operation of the system is intuitive, in comparison to other manufacturers. A short introduction is sufficient to understand the basic functions…’
Addressing user needs…?

- Research shows engineers are intelligent and creative but have little empathy

- Situations, tasks, cues, plans, social and organization…
  - Not the average engineer’s experience and knowledge
  - Context of use

- Harmonization is key
  - Task-centered design
  - Socio+technical
  - Job and tool should be designed concurrently
…an ECDIS…this screen is more user-friendly… we can work like we did in the paper chart…can be used for planning
Take-home points

• E- is more than navigation
• User needs not wants
• Context of use
• Design before training
• Support innovation, allow inheritance

• Overview
• Communication
• Reliability
• Trust
• Harmonization
Shaping ships for people

We design working environments