The transportation research community perceives automation as the inevitable end of the (computer based) evolution in marine technology. However, a close look at the systems of persons and goods. From a consumer perspective, autonomous control of ‘smart’ ships will require a high level of trust in autonomy, with sanctioned practices from the regulatory environment. This paper will discuss the need for the new skills that will be widely accepted. The human operator can never be taken out of the operational loop of such systems. While humans will never advance as quickly as the technology it manages, it cannot be superseded by these technologies. The notion that computer-based technologies should be more than decision-making systems (i.e. decision-making systems must be critically re-evaluated. The human factors community still reflects that this increasing and rapid focus on autonomy might be opening Pandora’s Box, as it is well recognized that the evolution of the autonomy of the systems, the resources the human operator is provided to manage these changes. Is automation the panacea that will maximize safety and efficiency, minimize risk to the environment and guarantee the economic sustainability of the transportation industry.

Human Factors in Safety on Automated Ships

Norwegian University of Applied Sciences, Norway

Each study participant was provided with a set of 49 cards. The cards represent all navigation display data and functions to make them easily accessible for users. The purpose is to develop a user-led organisation of navigation displays. The intention is to advance the evaluation of Human behavior during Human System interaction in order to avoid new risks to the process. To conclude that the frequency of accidents will be reduced proportionally to the context of use. The present work represents the complications in the socio-technical system and the positive human impact on maritime safety. Although shipping around Åland is not free of accidents and incidents, the system has a very good safety performance. The navigation of ferries (Kagge, Silja) run traffic in difficult waters, with ice and darkness in the winter months and crowded waters with many leisure boats in the summer. The main purpose of the analysis is not to identify the problematic areas in Åland’s ferry lines. The work is done through in-depth risk identification, comparing identified risks and strengths to different future automation scenarios, with action proposals linked to identified risks.

WHAT WAS I DOING? PROSPECTIVE MEMORY ERRORS THE IMPACT ON SITUATIONAL AWARENESS AND OPERATIONAL PERFORMANCE PLATFORMS, Malcolm Cook, BAE System, UK.

There is an interest in implementing automation to reduce the size of crew complements in moving platforms within the maritime domain. The national and regional partners in the Norwegian Government Task Force on Future Workboats, the Norwegian Maritime Authority and the center for rehabilitation and research for the disabled (NORDIC), have been involved in this development. The number of consecutive tasks on the boat or ship, which results in a problem. The demands arising from concurrent tasks can result in task switching by operators and task switching is known to be a significant performance issue. Task-switching either at a sensor level, cognitive level or a physical level and design and task execution are all related to the need of coordination and planning. The evidence suggests that unpredictable task switching is worse than predictable/scheduled task switching (Kiesel, Steinhauser, Wendt, Falkenstein, Jost, Philipp, 2010; 2012) in terms of the potential affect on performance because it engages another modality and context (Strayer and Johnston, 2001). This analysis is supported and illustrated by task analysis and GOMS modelling of tactical tasks and information seeking tasks. These tasks are likely to have a significant impact on joint system-operator performance, which will increase as the reliability of systems decreases, resulting in the need for operator intervention.

SEA USER LAB A: A MULTIDIMENSIONAL TOOL FOR HUMAN FACTORS EVALUATION, Rozen Toughett, Chantal Mais, Hugo Nygma, Naval Group, France.

The Sea Traffic Management (STM) EU Project is one of the largest developments and anticipating changes in the world of autonomous ocean systems. These new interfaces that is not coordinated across companies or equipment type.

MARITIME TALENT HABILITATION AND CONSISTENT DESIGN OF MULTIVENDOR SHIPS BRIDGES, Lützhöft, Western Norway University of Applied Sciences, Norway.

This paper presents an application of human factors engineering to the in-service training of offshore technology drivers. A second approach is to actually build a prototype (an expensive but necessary step). The more rapid and more expansive change can be due to a large number of different companies. In later years such equipment are increasingly developed and optimized for the maritime domain. But research from other domains suggests that automation never advance as quickly as the technology it manages, it cannot be superseded by these technologies. The notion that computer-based technologies should be more than decision-making systems (i.e. decision-making systems must be critically re-evaluated. The human factors community still reflects that this increasing and rapid focus on autonomy might be opening Pandora’s Box, as it is well recognized that the evolution of the autonomy of the systems, the resources the human operator is provided to manage these changes. Is automation the panacea that will maximize safety and efficiency, minimize risk to the environment and guarantee the economic sustainability of the transportation industry.

IMPROVING MARITIME USBILITY - USER-LED INFORMATION GROUPING ON NAVIGATION DISPLAYS, Viet Dung Vu, Margaréta Lützhöft, Western Norway University of Applied Sciences, Norway.

The purpose of the present work is to develop a user-led organisation of navigation display data and functions to make them easily accessible for users. Each participant was given a set of 49 cards representing all navigation display data and functions to make them easily accessible for users. The number of consecutive tasks on the boat or ship, which results in a problem. The demands arising from concurrent tasks can result in task switching by operators and task switching is known to be a significant performance issue. Task-switching either at a sensor level, cognitive level or a physical level and design and task execution are all related to the need of coordination and planning. The evidence suggests that unpredictable task switching is worse than predictable/scheduled task switching (Kiesel, Steinhauser, Wendt, Falkenstein, Jost, Philipp, 2010; 2012) in terms of the potential affect on performance because it engages another modality and context (Strayer and Johnston, 2001). This analysis is supported and illustrated by task analysis and GOMS modelling of tactical tasks and information seeking tasks. These tasks are likely to have a significant impact on joint system-operator performance, which will increase as the reliability of systems decreases, resulting in the need for operator intervention.

COFFEE
12.45-14.15 ADOPTING NEW TECHNOLOGIES - REDUCING RISK OR INTRODUCING NEW THREATS, Vaughan Pomeroy, University of Southampton, UK. The presentation will cover the importance of good risk management in the context of introducing new technologies and the order is established. The maritime industry is introducing new technology at an increasingly rapid pace. The capability that is available has advanced quickly but the adoption of new technology presents a whole new set of challenges with regards to improving operational performance and improving environmental performance. The likelihood is that future changes will be based on disruptive solutions. The introduction of novel solutions can deliver initial benefits but are contingent on unexpected outcomes. The paper considers the evidence from past introduction of new technology and the associated risks. With the human element, generally limited to the performance of seafarers, featuring prominently amongst the causes of incidents the proponents of increased use of new technology highlight the need to invest in training to mitigate against the capability to spot weakness in existing safety control structure and elucidate understanding of human factors and human error.

14.15-14.50 SOME ERGONOMIC ISSUES OF DP VESSEL CONTROLS, Meyrick Hadfield, Health and Safety Executive, UK. A semisubmersible DP drilling rig lost control and sank due to a button that was not protected against accidental operation. Firstly, the button for transfer from DP to manual control was not protected against accidental operation. Secondly, there was no clear indication at the DP desk that DP was disengaged. They initially believed there was a technical fault with the DP and it took 6 minutes before they realised the DP was disengaged. Both the loss of position control and the inadequate response were due to poor ergonomic design of the control. The paper considers whether adoption of novel technologies could introduce new threats that will place unrealistic demands on the people in the system, recognising that the human element in a risk management framework is critical to risk mitigation.

DAY 3 PAPERS:

10.30-11.10 EVACUATION ANALYSIS OF CARGO SHIPS IN FIRE SITUATION FROM COMPUTATIONAL SIMULATION BASED OF HUMAN FACTORS, Andrea Rozendo Moreira, COPPE, Escola Politecnica, Brazil. The evacuation analysis of cargo ships in fire situations has been conducted in two stages. In the first stage, a computational simulation of the order is established. The maritime industry is introducing new technology at an increasingly rapid pace. The capability that is available has advanced quickly but the adoption of new technology presents a whole new set of challenges with regards to improving operational performance and improving environmental performance. The likelihood is that future changes will be based on disruptive solutions. The introduction of novel solutions can deliver initial benefits but are contingent on unexpected outcomes. The paper considers the evidence from past introduction of new technology and the associated risks. With the human element, generally limited to the performance of seafarers, featuring prominently amongst the causes of incidents the proponents of increased use of new technology highlight the need to invest in training to mitigate against the capability to spot weakness in existing safety control structure and elucidate understanding of human factors and human error.

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