Accidents due to Human Error

The technology seems to be up to date – but are we?

■■ It is well known that human errors frequently cause accidents at sea. It is also known that accidents due to human error are increasing.

To understand more about this we must learn about how humans function; our shortcomings as well as our advantages. Technologically, the maritime business has shown impressive development over the past decades, including increases in the size of ships, in speed, in the number of passengers and volumes of goods. The technology seems to be up to date – but are we?

Addressing the human side of shipping must be the most effective approach for increasing safety. Fortunately, such an approach is not burdened by any significant economical investments. It is relatively cheap – compared to other costs in this business – to select mariners carefully, to train and develop them and to build strong, professional and safety-minded teams. It could be worthwhile to look upon humans as "modules" in a sociotechnological system and to identify some of the capacities and drawbacks of these "modules" in order to understand more.

Complacency and Lack of Situation Awareness

We might start with the collision in the English Channel in 2002, where the *Kariba* made a steep starboard turn and collided with the container vessel *Tricolor*. The fact that the *Kariba* went out of her way to ram the *Tricolor* amidships and sink her was a disastrous human error, as were the following two collisions with the wreck by other ships. The subsequent and numerous near misses are also significant. In spite of all possible precautions and extensive series of warning systems by every possible means, hundreds of mariners on numerous ships' bridges were involved at close quarters, each and every one as a result of human error.

Besides other sensitive domains of human error, such as team situation awareness, leadership, communication, cooperation and effects of stress, this accident can serve as an illustration of two of our other human shortcomings: Lack of Situation Awareness and Complacency.

Situation Awareness means "knowing what is going on around you"

Situation awareness is the ability to read a situation correctly and anticipate how it might develop.

It is dependent on capacities such as attention, perception, memory, anticipation and decision-making and therefore subject to individual differences. For a mariner, capacities like these are particularly essential. Without proper situation awareness, one might run into a well buoyed wreck or make a steep turn and unknowingly collide with another overtaking vessel.

Tests of suitability would benefit the maritime industry

Most people accept the fact that we humans differ and that the differences manifest themselves in different behaviour. We are not equally talented; we have different character traits as well as different sets of capacities. Habitually attentive individuals with undistorted, objective perception, with effective working memory and decision-making capacity constitute the best choice as operators of a ship, or for that matter, for being in charge of any other safety-critical transport system.

All knowledge about situation awareness supports the idea of carefully selecting those individuals responsible for the safe journey of a vessel. The methods for accomplishing such a selection exist in the form of psychological tests, or a combination of tests and ship simulators for those who are already trained. Using such methods makes it possible to rule out those individuals who have difficulties in maintaining a reliable

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level of situation awareness. As in the case of civil aviation, the maritime business would also benefit from tests of suitability, and the impact of human error at sea could be dramatically reduced.

The Situation Awareness was out of touch with reality

The maritime industry should avoid placing ships in the hands of individuals with difficulties in maintaining good situation awareness, i.e. people who have an inadequate capacity for simultaneous tasks, those who are easily distracted or who are disorganised, habitually absent-minded people, individuals who are easily bored, those with psychological problems, individuals lacking energy, habitually lazy individuals, nervous people, easily stressed people as well as individuals who overestimate themselves.

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This accident investigation (Kariba/Tricolor) concluded that the situation awareness on the various bridges "was out of touch with reality" and that many mariners were unable to grasp the situation in its entirety, to prevent a close-quarters situation from developing, let alone get out of one. The commission also mentioned "sloppy watch-keeping" as a contributing cause. Of course no one is sloppy or careless or makes human errors on purpose, but we might understand more about this by looking at an unfortunate drawback of experience.

Complacency – a state of mind

Most people would agree that the more experienced a person is, the better and safer that person's performance. This is, however, not a universal truth. Experience might make a person safer, but it is not inevitably so.

We normally define experience as the length of time a person has been at sea, but we should also emphasise what sort of experience. The very substance of a person's experience. Accidents and critical incidents do not occur regularly in most officers' lives and one-sided experiences may therefore insidiously lull an officer into a false sense of safety, because our experience might tell us that the job is routine-like and foreseeable. Completing numerous uneventful watches might bring the illusion that there is not a great presence of risk in shipping and the psychological conclusion is therefore that it is safe. An illusionary feeling we call "complacency" might build up.

No one chooses to be complacent

Complacency is an unconcerned attitude, where individuals behave and think in a routine-like mode, anticipating an ordinary development of the present situation. Complacency has a tendency to grow in situations where the frequency of novel events is low, while we keep vigilant and alert in situations where the frequency of new events is high. This is in line with the general observation that our mental system needs continuous stimulation from changes in the environment to maintain alertness.

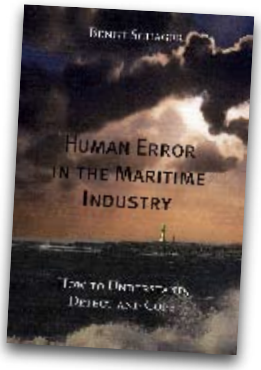
No one chooses to be complacent; it is a feeling that imperceptibly might affect even normally responsible and judicious mariners, making them ill-prepared to meet challenging, unusual or unexpected situations. Complacency impairs our situation awareness, which might lead to that we become surprised by changes in the environment and that we fail to understand, act too late or not at all.

Means to counteract complacency

There are means to counteract complacency, one of which is to become aware of it. The reason for this seemingly trivial step is that it is impossible to gain control over something that is not conscious. Therefore we have to label it, make ourselves aware of it and to constantly remind ourselves of it as a negative side-effect of routine and length of experience.

Human beings are not perfectly designed and do not function as straight and logically as computers. We humans are sometimes victims of our own dynamic mental processes and human functioning follows a logic of its own. We are not able to change our basic condition, but we can select appropriate personalities for sensitive tasks and we can organise so that errors stand a chance to be detected before they materialise into accidents.

Bengt Schager, M.Sc., is a maritime psychologist and has been working as a consultant for the shipping industry for the past twenty years. He is the author of a recently published book, *"Human Error in the Maritime Industry. How to Understand Detect and Cope."* This book, so far the only one that covers human error in shipping, is the result of a project promoted by The Swedish Club among others. For further information please contact Bengt Schager, bengt.schager@marine-profile.se



The book *"Human Error in the Maritime Industry"* can be ordered at www.breakwater.se