



## HUMAN FACTORS

# Human factors in pilotage: how good decisions are made under pressure

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In pilotage, the difference between a routine transit and a serious incident is rarely a single dramatic failure. More often it is the quiet accumulation of small pressures, ambiguous information, and assumptions that go unchallenged on the bridge.

Modern ports place extraordinary demands on the people who move ships through them. Vessels are larger, schedules are tighter, and the margins for error in confined water are smaller than ever. Technology has advanced, but the core of safe pilotage remains stubbornly human: judgment, communication, and the ability to maintain a shared picture of a rapidly changing situation.

When we investigate incidents, the technical facts are usually straightforward. What proves decisive is understanding **how the people involved perceived the situation**, what information they had, and why reasonable professionals made the decisions they did. That is the territory of human factors.

## The shared mental model

Effective bridge teams operate from a shared mental model: a common understanding of the plan, the risks, and the point at which the plan should change. When that model is strong, small deviations are noticed early and corrected quietly. When it fragments, the same deviations go unremarked until they become urgent.

Three conditions tend to keep the shared model intact:

- **Clear, closed-loop communication** so that instructions are confirmed, not assumed.
- **An explicit plan with defined limits** so that everyone knows in advance what a departure from the plan looks like.
- **A culture where questioning is expected**, regardless of seniority, so that doubts surface while there is still time to act on them.

## Workload and the erosion of margin

Human performance is not constant. Under rising workload, attention narrows and the capacity to absorb new information falls, often exactly when the situation demands more of it. Well-designed pilotage manages workload deliberately: sequencing tasks, protecting the pilot and master from unnecessary distraction, and building in moments to step back and reassess.

*The most resilient teams are not the ones that never encounter surprises. They are the ones that notice the surprise early and have the shared language to respond to it together.*

## What strong teams do differently

Across the transits and investigations we have been involved in, the crews that consistently perform well share a pattern. They brief properly before the task, not as a formality but to genuinely align on the plan and its limits. They keep communication precise under pressure. And they treat any expression of doubt as valuable information rather than an interruption.

None of this is expensive or complicated. It is a matter of deliberate practice, honest debriefing, and leadership that models the behaviour it expects. The return, measured in avoided incidents, is difficult to overstate.



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