Human Factors and having that 'Gut Feeling' when undertaking STS

Human Factors is a new section in the new OCIMF Ship-to-Ship Transfer guide, encouraging focus on the potential for human error in processes which could potentially lead to serious incidents. It is vital therefore that there is understanding of what is entailed, procedurally and mentally to undertake the role of the POAC when berthing ships underway.

Many organisations are talking about human factors with their contribution to incidents in particular and it appears to have the consequence of increasingly bureaucratic processes being developed. Despite the technology, risk management philosophies, checklists and training that are developed for the STS transfer industry, it is still seen as high risk and incidents do occur. Are we as an industry missing something, or could some of the precautionary measures that are being implemented be having a negative impact when set against each other?

This article will explore where, I believe, there could be a new focus area to address this concern.

An 'unexplainable' element in any occupation is a vague concept called 'gut feel' and its importance is, for the most part, ignored or placed on a pedestal of great skill. During an STS operation, and piloting in general, a huge part of the decision making is based on gut feel because we are making a 'sub-conscious assessment' of what an appropriate action may be. For experienced pilots, always thinking a number of steps ahead provides that sub-conscious calm which ensures clear thinking and avoids paralysis, particularly when an action does not give the expected result. This is not necessarily what the industry or STS client base want to hear, but if correct and the sub-conscious plays its part, what are we doing to 'train' sub-conscious decision-making based on gut feeling to increase operational safety. How do we make sure that the hardware and processes that are in place actually support, and not detract from, the decision making processes of the POAC or pilot?

Capt. 'Sully' Sullenberger safely landed a passenger plane on the Hudson River purely by feel, his undoubtable skill, experience (muscle memory) and luck (miracle). While a lot is made about these elements, many professionals and perhaps even Capt Sully, would use the term 'gut-feeling' to explain decisions he made. There is no doubt he was unconsciously making extremely rapid decisions with no time to plan and analyse the consequences, so what skills are being used and are they relevant.

How many times as Pilots and Mooring Masters, have we explained an action or decision on gut feeling and yet within maritime human-factor training, there is nothing that gives any guidance on what this actually is, or how to use it. When we start to research what 'gut feeling' means from an academic perspective, there are not a lot of reference materials to provide guidance which may provide some insights to the mental processes that perhaps can be classed as gut feeling, but there is certainly no golden bullet that we have found which we can use to define it. There are however, books on heuristics, which help describe elements of what we sometimes call skill, instinct or gut feelings, and these may help us understand the simplistic processes behind rapid decision making and its reliability.

What is interesting, and I believe relevant, are some of the traits of people who have an aptitude or perhaps a 'gut feeling' for an activity. Perhaps the most interesting and

perhaps most controversial, is the ability to ignore a variety of data which would naturally point to a specific conclusion and, instead, focus on a single piece of information to make a decision. Perhaps Capt Sully unconsciously absorbed and ignored multiple data points on a regular basis and relied on unconscious rules of thumb. If X happens, then you should do Y (a very simplistic strategy which on reflection, I do when piloting), effectively using your subconscious to risk assess and filter all the sensory information to determine a decision.

If however we put that into an incident report, there would no doubt be a few raised eyebrows, but this is actually what piloting is all about in ship-to-ship transfer. There is no time to over analyse when you are on the bridgewing coming alongside and in my opinion, having a gut feeling for the handling of the vessel and systematically and subconsciously ignoring superfluous information allows the brain (mine certainly) to retain focus on what is important.

All our sea going rules tell use to use 'all available means' for a specific task and if something goes wrong, we are judged on how many we considered, or not, as the case may be and traditionally this has implied that, somehow, we have to mentally absorb and process a huge variety of information. So, as an exercise, I asked a number of our POAC's about their perception and use of 'gut Feeling' in their day-to-day operations. It's fair to say, everyone had some level of difficulty describing the concept and how they used it but I've summarized their responses as below.

Summary of POAC's perspective of Gut-Feeling

From the perspective of a Person in Overall Advisory Control (POAC) or Mooring Master during Ship-to-Ship (STS) transfer operations, 'gut feeling' is not a primal instinct but rather ***a sophisticated, learned skill***. It is best described as ***an intuitive sense of unease or confidence*** that arises from the ***subconscious integration of sensory inputs, past experiences, and situational cues.*** This intuitive sense functions as a ***mental alert***, flagging anomalies in real-time when something deviates from the expected norm. It represents the cumulative weight of both overt and subliminal signals processed during an operation. This subconscious mechanism generally computes that 'all is not well' based on subliminal experience, or that one or more certainties relied upon are no longer providing comfort. A common approach involves mentally filtering out 'normal' conditions and focusing on these anomalies.

Elements contributing to 'gut feeling'

The development and effectiveness of 'gut feeling' in marine operations, particularly in high-pressure STS transfers, are profoundly shaped by both ***extensive experience*** and ***targeted training***.

The Contribution of Experience

Experience forms the bedrock of 'gut feeling' in marine operations, making it inherently difficult to fully teach through rote procedures alone. As expressed by many POAC's, there is 'no substitute' for experience, which is largely 'made from encountering dangers and mistakes in previous operations and learning from them'.

Key aspects of how experience contributes include:

- **Situational Awareness and Pattern Recognition:**
  Experience provides a 'learned, experience-driven situational awareness' that enables POACs to identify deviations from the norm instantly. Repetitive, continuous exposure to similar operational scenarios with varied environmental parameters builds ***pattern recognition*** and ***a heightened sense of***

situational awareness. This is crucial for rapidly and timeously determining if an operation is progressing as planned.

- **Enhanced Judgment under Pressure:**
  Piloting under high-pressure scenarios, such as STS in adverse weather conditions, significantly amplifies the role of gut feeling. The psychological aspects of decision-making in these moments are influenced by an 'emotional coefficient'—the interplay of stress, fatigue, and external pressures that can either cloud or sharpen judgment. For example, a POAC, after considerable experience at sea, can develop a 'feel for a ship and the ability of its crew'. This allows them to assess crew competence and attitude during pre-operation briefings (like the Joint Plan of Operation, or JPO, and toolbox talks) and make a reasoned decision to delay an approach if doubts arise about safe and quick mooring in marginal weather. Having a 'gut feeling' for an operation, ensures that when the outcome of a manoeuvre does not provide the anticipated result, the POAC is not paralysed by it.
- **Reading Subtle Cues (Overt and Subliminal Signals):**
  Over time, POAC's become acutely attuned to both clear and subliminal signals that contribute to their overall assessment, providing either comfort or unease. Perhaps, in a world with POACs and pilots possessing perfect analytical skills there would be no incidents, every possible scenario would be considered and no incidents would result. Unfortunately these individuals do not exist and there are clearly distractions and impediments to an effective operation which are absorbed by the POAC when he goes onboard.

Some of these are considered below:

Clear Signals include:

- **Crew Performance:**
  Slow response times, language barriers, or a distracted Master can signal potential breakdowns in bridge team dynamics. The speed of reaction in passing messages and delays in implementing orders are also monitored.
- **Vessel Response:**
  Delays between issuing an order and the ship's reaction (e.g., rudder lag or a suddenly increasing rate of turn opposite to the approaching angle) indicate mechanical or operational issues. Observing the helmsman's rudder management and engine order implementation is also key.
- **Environmental Cues:**
  Sea conditions, water colour changes, shifting currents, unexpected wind behaviour, wave formations, and the wake behind the ships can hint at proximity to hazards or adverse scenarios. Observing the water flow alongside the ship or the fender's alignment can provide real-time operational status and guide pre-emptive rudder adjustments before for example when stern suction is visibly apparent..
- **Equipment Feedback:**
  Sounds like the gyro repeater's click or visual cues such as lights dimming when compressors kick are sensory elements being absorbed. Other elements such as a clean gangway/pilot ladder rigged correctly, a tidy ship, and an organised deck crew indicate readiness for the operation.

Subliminal Signals are more intuitive:

- **Personal State:**
  External factors such as jet lag, family concerns, or financial stress can subtly erode focus, making the POAC hyper-aware of their mental clarity.
- **Intuitive Discomfort:**
  This manifests as a 'vague sense that 'something's off'', often stemming from subtle mismatches like a crew's hesitancy or an unusual wind speed variation and cloud formations signalling worsening weather. It's when the subconscious flags a concern based on subliminal experience, computing that 'all is not well'.

A wealth of accumulated experience allows POACs to filter out 'normal' conditions and specifically focus on anomalies, enabling them to make instinctive, yet highly informed, decisions.

How can we filter out some of these distractions and best utilise gut feeling is considered below:

The Contribution of Training

While deeply rooted in experience, 'gut feeling' can be ***cultivated and enhanced through specific training methodologies.*** This is particularly important for Ship-to-Ship Transfer Companies, which operate as High Reliability Organisations (HROs) and are continuously sensitive to unexpected changes, making situational awareness extremely important.

Training methods that contribute include:

- **Foundational Knowledge and Procedures:**
  A ***thorough understanding of operational procedures*** and fundamental ship handling principles provides the ***framework upon which gut feeling is established.*** Without adherence to systematic documented procedures and principles, relying on gut feeling could be based on 'scanty information'.
- **Mentorship:**
  Pairing novices with experienced POACs allows them to observe ***real-time decision-making*** and subsequently discuss subliminal cues and thought processes post-operation. This transfer of practical knowledge and intuition from seasoned professionals is invaluable. Its often the little things that make the biggest contribution to confidence.
- **Simulation Training:**
  Exposing trainees to ***high-pressure scenarios*** with adverse weather or equipment failures in a simulated environment helps them build pattern recognition and crisis command capabilities without real-world risk. Such training effectively replicates scenarios that lead to valuable lessons, often without the 'expensive lessons' learned from actual incidents. It is essential that these training methods include experienced personnel who can impart their actual experience into the activity.
- **Emergency Drills and Familiarisation:**
  Regular emergency drills, particularly those related to STS operations, help prepare crews for unexpected situations. Training also includes understanding roles and responsibilities, machinery operation (winches/cranes), mooring/unmooring procedures (including quick release systems, line characteristics, fender management, and snap-back awareness), personnel transfer, hose connection/disconnection, and emergency operations like aborting mooring or dealing with a cargo spill. This builds the necessary practical skills that underpin confident decision-making, even when relying on intuition.
- **Checklists for Awareness:**
  Structured lists of clear and subliminal

signals can be developed to ***train situational awareness***, specifically emphasizing anomalies rather than routine checks. This helps formalise the recognition of signs that contribute to gut feeling. Checklist 'fatigue', from the excessive duplication of the same information, erodes valuable time that can otherwise be used to hone your feeling for the operation ahead.

In essence, 'gut feeling' in marine operations, particularly for POACs/Mooring Masters in STS transfers, is a ***dynamic blend of profound experience, learned situational awareness, and honed emotional resilience.*** It is shaped by a continuous stream of both overt and subliminal cues. For High Reliability Organisations like STS transfer companies, this intuitive capability is crucial for continuously detecting, containing, and recovering from errors, thereby enhancing overall operational safety. By documenting these signals and integrating them into structured training and mentorship programs, the maritime industry can better prepare POACs and communicate critical decisions to non-seafaring stakeholders.

Perhaps, as is often the case, it is more important what is not actually said and the lack of reference to a form of ***Psychological Resilience*** type training to address the 'emotional coefficient'—the interplay of stress, fatigue, and external pressures (such as commercial demands or personal issues) that can influence judgment. However, it was clear from the feedback that our team understand the need to learn hugely by experience and have a 'feel' for the task, but explaining how that 'gut feeling' is used is not so easy.

If we refer to Heuristics, there are a few clues to how decision making is done under stress and how experience hones the ability to quickly determine the most important data point and make a decision based on limited information, even though there is more information available. By teaching ***stress management techniques***, this training could help POACs mitigate these external influences, allowing for clearer judgment and more reliable gut feelings.

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The dictionary describes Heuristics as a way of solving problems by discovering things yourself and learning from your own experiences. ***However, heuristics***, in cognitive psychology, is a process of intuitive judgment, operating under conditions of uncertainty, that rapidly produces a generally adequate, though not ideal or optimal, decision, solution, prediction, or inference. Heuristics function as mental shortcuts that produce serviceable results quickly and with little if any effort on the part of the thinking subject, who is most often unaware of their operation.

The heuristic concept, of our brains containing perhaps what could be classed as an 'adaptive toolbox' of experience, capacities, processes and rules of thumb that link processes to make complex decisions quickly, starts to make a bit of sense. The above could be the description of how nearly every Pilot works and a significantly important consideration when considering Human Factors and their role in incidents.

There are a couple of heuristic traits that stand out when we refer to piloting;

For example the 'Gaze' heuristic is a trait that can be best described by considering the scenario of a fielder running to catch a base-ball or cricket ball. The fielder does not make loads of calculations on wind, speed, angle, he simply runs and catches the ball. The technique he uses is simply relative vectors, in that he adjusts his speed to visually maintain the ball at a steady relative angle and elevation exactly as we analyse collision risk in navigation.

When undertaking STS there are a number of similar subconscious relative vectors that we

react to, such as the angle between the two hulls to determine relative approach angle and speed or transits to determine the position or relative speed between the two vessels. Signals like these get cross referenced with, for example, the heading or speed data by the POAC early in the approach then the gaze heuristic takes priority away from actual quantum and it becomes a subconscious input which reduces the decision making time when you see a material change or trend and you take an action.

This leads on to another heuristic trait, which is the ability to interpret information by simple rules of thumb, and begin to ignore information as it becomes irrelevant. Whilst all the elements as described by the POAC's can be relevant at the early stages, when you are in the late stages of the approach there are only the two hulls approaching a fender landing point and a reducing option to abort the manoeuvre. All the other guidance, checklists and information leading up to that point, have been with the intention of ensuring nothing is missed but it is also reduces the decision making to the rudder angle and engine power due to interaction in the final stages. On final approach the POAC should have very few decision choices necessary and these decisions should elicit an immediate response, ie. rudder port or starboard or engine power increase or decrease. In the critical final moments during berthing, landing on the fenders in a controlled way are all that matters to the POAC and unless there is an emergency the rest of the information is secondary.

Conclusion

Within the scope of Human Factors contributing to incidents, there should perhaps be more focus on training which considers the psychology of rapid decision making under pressure and more detailed training on developing a 'gut feel' for a task or operation. Better understanding of what we are, perhaps subconsciously doing, will enhance decision making and encourage better decisions by understanding what is influencing the individuals limits and putting more trust in gut feeling and the confidence to say no.

There needs to be recognition that overburden of checklists and processes ahead of an operation may actually reduce the overall safety and can distract the POAC from critical familiarisation time to develop his feel for the ship and operation. The risk is that if we overly prescribe how things are meant to be done whilst placing broad parameters on criteria, we are at risk of impeding rapid decision making which, in turn, could lead to ignoring that 'gut feeling' and eventually lead to the escalation of a developing situation. Procedures provide parameters within which to operate, but as we know, these only provide an individual theoretical limit, which rarely matches the complex conditions that are experienced. In all cases the POAC/Captain/Pilot use their best judgement to manage the risk and that judgement is basically a 'gut feel' utilising experience and common sense to make the best decision.

In our opinion, are in world with the ship-to-ship transfer industry heading on a different track to the importance of gut-feel decision-making. More and more checks and unnecessary checklists dilute the time that is essential for the POAC to acclimatise themselves to the vessel and get his gut in order. Unlike restricted water piloting, where navigational aids alert personnel to danger and for the most part tugs provide the redundancy power to mitigate decisions, STS is unforgiving and depend on a single individual.

But still, offshore operations are by far the safest, economic and environmentally friendly way to avoid catastrophic incidents and resulting cargo loss. It is vitally important that we drive our industry forward with recognition of the uniqueness of the skill and importance of the gut-feeling that is

necessary to moor two tankers together in the open sea to safely transfer the cargo.

The POAC example is a microcosm of a bigger picture problem, where 80% of Marine accidents are caused by the human element and an increase in global incidents of 10% year on year 2023 to 2024 is a significant concern. More checklists are not necessarily cutting the numbers and risk becoming counter-productive in a world looking for someone to blame and an easy cheap fix. If we are really exploring human factors as the cause of accidents, we should ensure that the art of rapid decision making, or learning, using and fostering 'gut feel' correctly is introduced into training and evaluation of human factors in incidents.

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