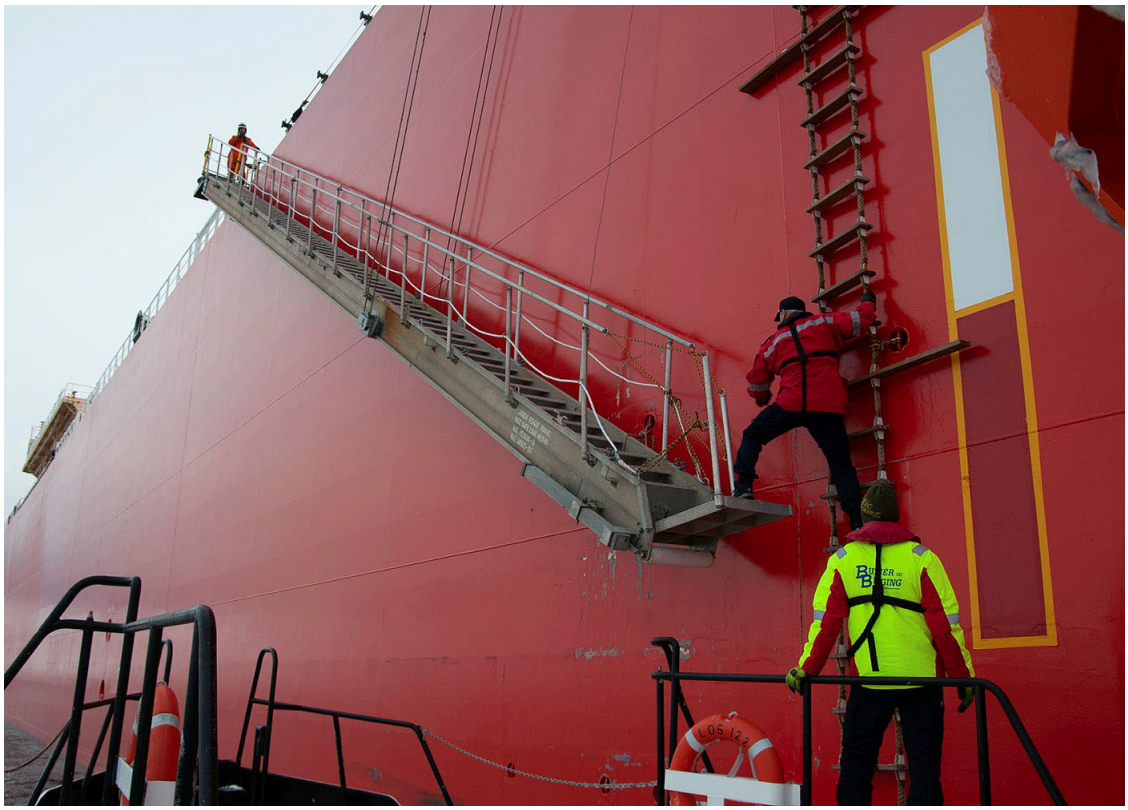

Bridge resource management – A pilot's perspective

From boarding to berthing – our Bergen based author describes the interaction within the bridge-team and concludes that effective communication is key to safe navigation.

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I see my next vessel looming on the horizon on the pilot boarding-ground, as the pilot-cutter navigates the choppy waves leaving seaspray running down the windows only to be whisked away by the windshield wipers. What and who is awaiting me as I enter the bridge of this vessel? Will they expect teamwork, or will I have to make all the decisions by myself?

I asked the newly graduated pilot-trainees about what surprised them the most when they entered their pilot training. I did this at a course I held for them recently. The answer was that they never expected such variation in ships, people, and situations. This variation is hard to describe. Pilots in our region service most vessel types, virtually all seafaring nationalities, all kinds of equipment working and not working, and bridge teams ranging from 1 to 25 persons. It's really no wonder the trainees felt a bit overwhelmed. I experience as many ships and bridge-teams in a duty week as a mariner does his or her whole career!

It takes a certain type of individual to handle this variation in an unpredictable working environment, and the perception of this in the industry seems to have changed in the last decades.There has been a gradual transition in the role of the pilot to more integration into the bridge team due to the focus of Bridge Resource Management (BRM), and to the introduction of Electronic Chart Display and Information System (ECDIS) both operational and in a regulatory sense.

The pilot, just like the captain, used to be viewed as some kind of superhuman that could handle any situation that may arise, and take care of any problem while navigating and handling the vessel. However, over the last decades this notion has been reconsidered. As BRM dictates, a single team member's misconception should be corrected by the team. We are not as flawless as we seem to think.

And still, accidents occur with a pilot onboard. We cannot change the fact that under pilotage the margin of error decreases and the level of criticality rises due to narrow and shallow waters, traffic density, tight harbor operations with tugs involved among other things. What we can influence is how we communicate, exchange information, and coordinate the work of the bridge team.

" *Ladder looks okay, ehh?"* - the voice of the skipper of the pilot-cutter pulls me back from my musings. " *Yes – looks good"* and I begin my climb towards the bridge. As I enter the bridge, I try to get some kind of overview of the situation - people on the bridge, traffic around the vessel, the position of the vessel, the layout of the bridge equipment and so on*.*

"How are you Mr. Pilot?" - I am greeted by the friendly face and the firm handshake of the captain. We dive directly into the master-pilot exchange (MPX) with details of the vessel, the pilotage ahead, and most importantly, in my view, the sharing of *mental models*. The theories of how teams succeed and how they maintain situational awareness highlights the importance of shared mental models. The mental model I have for the sequence of navigation and operation until berth includes expectation of traffic in the fairway, weather and current among other things. All this I share with the bridge team. My intention and hope are that they will integrate this into the mental models that they already have and maintain them through dialogue as the pilotage proceeds and that they share their knowledge and information of the vessel with me.

In preparing the course for pilot-trainees, we systematically looked at 12 accident reports involving pilot onboard, and some of them indicated quite strongly that the sharing of mental models between pilot and bridge team are crucial for maintaining and updating situational awareness. Enabling a dialogue on traffic and navigation from the start of the pilotage lowers the threshold for reporting uncertainty.

I take "the con" then Captain? I ask after the MPX is finished. " *She's all yours"* , the captain replies.

"The con", or conning, is not command. As a Norwegian pilot I will never have command of the vessel. It is always the captain, or his representative, who has the ultimate responsibility for the safe navigation of the vessel. This is true in most of the world with a few exceptions, such as the Panama Canal. Although formally I am not in charge, the expectations from different captains may range from a role that is easily confused with command to that of a pure advisory role which is more in line with the regulatory sense of this relationship.

"Would you like some coffee, Mr. Pilot?" Ahh, the universal ingredient of all successful pilotages.

As we are approaching the narrowest part of the pilotage, I get this sense of unease. My neck tingles and my "equation" doesn't seem to add up. I have set up the radar with the parallel index to the correct bearing and distance to monitor my approach in the sideways running current, and I have made my plan and intention clear to the bridge team how to pass the narrows. The GPS-vector and what I observe outside seem to be disagreeing with the geometry of the radar. This is an example of what one would refer to as uncertainty, or an early warning sign of possible danger.

The pilot is limited by the same frailty of human perception as the rest of humanity and at times needs the help of the bridge team to maintain and update his or her situational awareness and to have possible misjudgments corrected as prescribed in BRM. If the pilot stands alone as the only member of the bridge team defining the situation with inputs, and making judgements about the situation, he or she will make themselves *a single point of failure*. For the pilot to avoid being a single point of failure, the pilot should present all of the criteria for judging a navigational situation through dialogue with the bridge team and captain – also referred to as "thinking out loud". The experienced navigator cannot help but make the assessment of the situation when presented with all relevant criteria. And importantly, with all information available any member of the bridge team is able to challenge the pilot's decisions.

"Mr. Pilot - seems we're drifting to starboard?" the captain says. I agree and decide to trust the GPS-vector, and the captain's observation, and alter the course to port.

"There seems to be something funny with your radar, Captain". The captain admits that he forgot to tell me about the gyro-error when we conducted the MPX, an error which caused the geometry on the radar-screen to appear a bit ascue.

The fact that the captain made his uncertainty known by speaking it out loud is an important part of *the theory of mindful interaction* where sharing of information and knowledge along with the articulation of uncertainty and sharing of mental models are the key elements. This gives the team heightened vigilance, and it uncovers uncertainty sooner. Consequently, the capacity to correct errors increases within the team, and it seems to counter the effect of hierarchy.

I had made my intentions clear for the passage of the narrows and made sure that the bridge team understood my mental model of this phase of the pilotage. This enabled the captain to assess the situation as it progressed and speak out his uncertainty about drifting to starboard. It is not misunderstandings and errors that cause accidents, it is the team's lack of ability to correct them.

"Looks like we're not being set to starboard anymore, Mr. Pilot" . I see the captain relaxing a little, as he sits back down in his chair.

The effect of hierarchy is something the pilot needs to be aware of. It may be that the bridge team has a high level of respect for the pilot's authority and skill, and it keeps them from sharing unique information with the pilot because they assume the pilot is already aware. When the pilot voices uncertainty the pilot can counter the bridge team's potential reluctance to share information due to perceived hierarchy. That lowers the threshold for the team members to speak up.

I've noticed that there is a friendly tone of respect among the members of the bridge team, and the captain appears to trust his Officer of the Watch and leaves him to fulfill his duties. They seem to have a conversation about everyday subjects when there is little happening in connection with the pilotage. For a pilot, as for everyone else, one cannot access what is going on inside the head of other team members. One can only observe behavior and maintain a dialogue. Remember, I have been onboard less than an hour, and I do not know any of the team members.

There are perhaps three tell-tales that are rather easily identified that can tell us something of the performance of the bridge team*.* The level of *team-trust* , being how safe it is to take interpersonal risk within the team, is a strong indicator of how well a team is functioning. I have already mentioned the importance of shared mental models, and in team leadership the captain's ability to facilitate the sequence of events and offer guidance to the bridge team on this is an important part of cognitive leadership. And last, does the behavior of the captain calm down the team, or does it make them more uneasy and stressed - this referred to as affective leadership.

I remember a pilotage with a rather young captain of an outbound crude oil tanker. We were waiting for the deck crew to be ready "fore and aft". Departure was set for 12 o'clock midday, and it was obvious that the crew had been inside to eat and were hurrying to get to their positions. The captain complained that eating is more important than working to them. Later I observed how his tone kept the bridge team from sharing information. It seemed to me that the team was reluctant to share information that might not go over well with the captain. A pilot can only do so much in the short period he or she is onboard. It is the captain that is the centerpiece of developing a well-functioning bridge team that can integrate the pilot in their operation and support the pilot's duties on the bridge.

" *Fifteen minutes for the tug, Captain". " Ahh, I'll call for the deck crew to make themselves ready. "* The captain picks up his radio and tells the bosun to get ready to receive the tug. " *Starboard side, maindeck forward of accommodation, Mr. Pilot?"* The captain looks directly at me. I give him a distinct nod and a *"yes Captain"* while I look him in the eye. He repeats the position of the tug to the bosun via radio. During the MPX I explained to the captain why this position was optimal.

Language can quickly become a challenge, especially when one ventures outside the maritime standard phrases and the bridge team lacks the basics of the English language. A certain captain comes to mind as a good example of how to handle language barriers. He was a captain of an inbound VLCC. It was evident to me that he had difficulties speaking and understanding English. He could utter the words, but I had a suspicion that he did not understand all the words that well. In the MPX we discussed the sequence of tugs, mooring lines, the berthing maneuver and so on. I drew sketches on paper and used the ECDIS actively. The captain nodded and gave the impression that he understood. A few minutes later he engaged me again, asked questions on details with references to the sketch. After discussing the matter with his officers, he engaged me once more. After another short discussion with his officers, I saw on his face that he finally understood my plan and that it made sense to him. The multimodal communication was not the key element in the success of this exchange of information, it was the captain's attitude. He understood his shortcomings in the English language and engaged in a way where no one lost face by breaking the operation down into smaller parts and asking questions until he was sure he understood.

"Position!" sounds the voice of the loading master on the radio. *"Dead slow astern, make fast springs Captain!"* We are finally alongside, and the vessel can start their loading-operation safely.

Now would be a good time for a debrief, which is normal in most types of operational settings, just not for the pilot. The pilot is a "lone wolf" in the maritime industry. We handle different ships and people every day, mostly alone, sometimes together with a colleague. This demands strong, confident, and independent individuals. This comes with a price. Often there is no culture for learning from one's performance because there is no one who is looking over my shoulder to evaluate my work and help me to improve my performance. I suspect that the same goes for many captains, their officers might not be willing to criticize their captain. My suggestion for this is for the pilot and the captain to agree at the start of the pilotage to have a debrief after the maneuver is ended and pick up on the learning points that may arise. As a rule of thumb, one should offer no more than three good and three bad observations, and always the equal number of good and bad.

As I leave the bridge, I cannot help but think about how this pilotage was made less demanding by a well-functioning bridge-team willing to accept and integrate my insights and knowledge, and support and challenge me to ensure the safety of the vessel, the people involved and the environment surrounding us. The act of voicing uncertainty as a member of the bridge team whether you are the pilot, or the helmsman is key to correct any misunderstandings in the team and assure a safe transit for the vessel. I have come to think of this as "professional uncertainty" – an integration of active questioning in dynamic situations and a concept I am considering incorporating in the training of new pilots.