Shore Based Pilotage, a matter of trust

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Issues like the Covid 19 crisis and the moves towards increased autonomy appear to be driving a renewed interest in Shore Based Pilotage (SBP), nowadays often called Remote Pilotage. I'll stick to the term SBP, not only because this is the English term that we use in the Netherlands, but also because this alludes to the pilot being ashore.

In the Netherlands, Shore Based Pilotage has, for certain types of ship, been a reality for many years (see side bar). I've had the privilege of getting a perspective on SBP from different angles; providing SBP, boarding after SBP, planning pilot tenders, talking with stake holders and I'll try to capture some of the relevant aspects of 'pilotage' from that point of view. As a starter I'll set a scene from my own experience. Good communication is inherent to pilotage in general, and it's important to see how the communication possible in 'traditional' pilotage compares with what is possible in SBP.

I was in the pilot office bound for a bulker that would be going through the lock at maximum draft. I was making my preparations when VTS phoned me with a question about lock planning: 'Are you going to enter the breakwaters on arrival?' I had to say that I didn't know.

In Amsterdam/IJmuiden we have the bad luck that the peak of the tidal stream is 30 minutes before high water. For ships with a draft > 14.1 m there is a formal restriction of 1 kt cross current. There is no such formal limit for ships going through the lock, which has a max draft of 13.75 m. Under certain combinations of wind and current, a number of marginal ships cannot safely enter the breakwaters until the current has reduced. However, these ships need to enter before the water level has dropped too much, making something of a puzzle for lock planners.

To know if entry is feasible, I have to be on board, because I have to line up the ship on the correct heading and speed for entry. I have to check how much rudder I need to maintain this heading. Then I have to decide if there is enough rudder left to counteract the kick of the tide (stern still set to the North with a cross current of 1.5 – 2 kts, bow out of the current) when entering. The back-up measure is a kick full ahead with rudder hard over, so I need to know manoeuvring speeds and critical revs. If after this test I am not certain, I will have to wait until the next tide.

This illustrates some of the technical issues you meet when you contemplate SBP for more complicated voyages. And I do notice a lot of effort is put into determining what technical information is necessary and how this information is communicated from shore to ship, and from ship to shore. Directly connected to these technical aspects is something which is at least as important: the human factor.

The human factor

When I'm on board, using pencils, hands and everything else that is available, I can explain the issue of coming off current when the ship passes the breakwaters. I can gauge understanding. I get a feeling for crew and ship. This helps to develop my trust. The captain can see me when I explain things, and also during the operations, which helps to develop their level of trust. After all, communication between people is for the larger part non-verbal! The captain can easily ask me for clarification if they are uncertain. I can easily explain the 'variations on a theme' I make to adjust for the specific circumstances and ship.

But if I'm just a voice out of a box, will the captain be happy to have the beach dead ahead 700 m before entering the breakwaters – or will

SBP in the Netherlands

Until 1988, the Netherlands mandated compulsory pilotage but, with the exception of dangerous cargo in bulk, there was no sanction if a ship didn't take a pilot. If pilotage was suspended due to adverse weather, this meant if the captain felt confident, he would bring the ship in to a place where the pilot could board.

Subsequently, the terms of compulsory pilotage were eased, but sanctions were introduced for non-compliance. In adverse weather, larger ships could get a pilot by helicopter; smaller vessels would have no alternative than to wait, possibly for days. These smaller ships had relatively larger navigational margins, could react more easily to the prevailing circumstances (for large ships the emphasis is on anticipating them) and the captains were often more used to sailing in restricted waters. In addition, technical development in radar systems, such as synthetic leading lines and easy measurements made it possible to give adequate advice and support from shore. As a result, an alternative became possible – shore based pilotage. This was first trialled in 1987, and has been in full use since 1988.

In the Netherlands, as in many other continental European countries, pilots are legally defined as 'advisers'. The law had a provision for pilots providing advice to a ship while being on board the pilot vessel 'steaming ahead' of this ship, so providing 'pilotage' when not on board. The provision for 'steaming ahead' was used as a basis to regulate pilotage from a designated, approved position ashore, thus the name Shore Based Pilotage.

Initial education, training and procedures were developed and improved, and have been continually adapted to keep pace with changing technology and equipment.

Today, there are two forms of SBP in The Netherlands:

- Providing pilot advice to ships from an approved shore station (co-located with VTS) if a pilot cannot board at the normal pilot station because of adverse weather and/or the construction of the ship. This continues until the ship reaches the position where a pilot can board.
- Providing pilot advice to ships that are approaching the normal pilot station in Rotterdam (Pilot Maas).

In all but a few specific cases, a pilot will eventually board the ship.

they start to ease the drift angle and aim for the opening of the breakwaters, just when the current increases even more? Will they tell me, or if not, how quickly will I discover this, and what influence will I have in trying to correct it? There is no turning back: the ship is totally committed from 3.5 miles out. There is no space to turn, as it needs to follow the dredged channel. No slowing down, because of the cross current.

Of course, there are many ships which are technically much easier to handle, and not as sensitive to the specific local circumstances, as these ships have more manoeuvring aids (such as thrusters, high lift rudders, etc) and have relatively more space. But trust continues to be a major issue.

In cases where captains are comfortable with handling their own ship, trust might be even more relevant. If there are specific reasons to approach a problem differently than normal, you will have to convince the captain of the need to do so. This requires a lot of communication and it requires trust! It might be harder to convince captain-owners, people who always handle their own ships – and who might be seen as prime candidates for SBP – than a captain of a large ship, on which normally pilots do the ship handling.

Communication

In a promotional video for the new VTS centre at Zeebrugge (https://bit.ly/3lwIZNT) the VTS providers highlight that all services are now on the same floor, so communications have improved greatly. I saw the same thing when VTS operations for Amsterdam Port, Lock Centre and Harbour Centre, previously all based at separate locations, were combined in the same workspace. Being able to look each other in the eye is just such a great advantage. I understand that there are ways to reduce the negative effects of not being in the same space, but that still means that there is a negative effect to start with. This is as true in the captain-pilot relationship as it is on the workfloor of VTS stations.

As SBP pilot I definitely feel less contact with the ship and crew; I feel literally at a distance. It helps to call at regular intervals, even if all is going well, so that the bridge team knows I'm still involved and connected. Even so, there is much less communication than if I am physically on the bridge, and there is always the nagging question: is the bridge team following my advice, and if not, will they tell me? There is this feeling that part of my job as pilot has been transferred to the bridge team.

Being the pilot boarding at the end of a stretch of SBP has complications of its own. When I am in the pilot office before boarding, the SBP pilot will brief me both on the ship/crew and on the circumstances (state of the lock, any traffic). While on the pilot tender I'll listen to the VHF communication, and if the SBP pilot or I think it is helpful, we will hold an additional phone briefing during the SBP process.

After boarding, I still want to have a Master/Pilot Exchange (MPX) on the main topics, but time is very limited, as I'm very close to the action (by the time I am on the bridge, the lock is roughly 1 – 1.5 NM away). I might board in a position that is not exactly where I would have been if I had made the trip myself. In a very short time I have to develop a feeling for the ship and crew under the environmental conditions (there is always a lot of wind). Talking to the captain once we are tied up in the lock, I have found that sometimes the captain did not feel that the SBP pilot had a good understanding of the requirements of their specific ship, or that the SBP pilot was following the ship all the time.

These effects are well known in literature. [Editor's note; a reading list is available on request]. All papers find that the quality of communication is reduced under SBP. Suggestions are then made to mitigate the effects. One paper talks about 'virtually being there', making sure that the bridge team know that the pilot sees and understands what is happening. From the pilot's perspective, it would be very helpful to see the bridge team in action as well. There are suggestions of including a visual connection in the communication between ship and shore, so that bridge team and SBP pilot can see each other.

There are suggestions of using route exchange (RTX) as a mitigating measure. However, often technically the RTX doesn't work as the format for electronic RTX is still vountary. Furthermore in pilotage waters, route planning is often not so much about a track *line*, but about planned *areas*, which are harder to communicate to the ship. Waypoints might be on land, as they are only construction reference points for a controlled turn. Not all bridge teams are able to work proficiently with these details.

Keep in mind that the Australian Transport Safety Bureau (ATSB) and New Zealand Transport Accident Investigation Commission (TAIC) have put maritime pilotage on their safety watch lists, pointing particularly to communication issues, such as the Master-Pilot Exchange. P&I clubs see insufficient communication as one of the main causes of damages (see Gard's 2006 Guideance to Master, 2.13.5.1, among others). If these are real concerns, then we should do our utmost to promote better communication!

Who has the con?

Literature on SBP comes to the conclusion that part of the present job of a pilot will be transferred to the bridge team. At present, in most ports on most ships, pilots will have the con, under the overarching authority of the master. While it is possible to con a ship from shore by remote control, as shown in tests carried out by eg Svitzer in Copenhagen, this would upset the Master/Pilot relationship. It would also require heavy investment in communication equipment and equipment ashore. Further, the ship itself would have to meet stringent requirements with respect to main propulsion, steering and thrusters. In practice, in SBP the con is handed over to the bridge team.

In a legal context, in most countries where the legal system is based on the Anglo-Saxon system, the pilot is defined as 'any person not belonging to a ship who has the conduct thereof'. In these countries SBP will run counter to the legal definition of pilotage.

The question of who has the con takes on even more significance when it comes to SBP for remote controlled and autonomous ships. Who will remotely control the ship: the shore centre of the company or the one of the pilot organisation? Again communication and trust are important aspects. Are autonomous ships able to deal with variables like coming off current, as in the example I started with? How would developers know all these variations? How would authorities know that the software is adequately developed for these specific local circumstances? The relationship with VTS will have to be redefined.

Most literature distinguishes 'sea' pilotage (in transit) and 'harbour' pilotage (shiphandling) and expects that SBP will only be suitable for 'sea pilotage'. In general the idea is that a pilot will then board for the harbour pilotage, or that SBP will end when the ship is near the berth and the ship's crew will do their own mooring.

In the NI's recent webinar about Remote Pilotage (sic) in Finland, for example, it was mentioned that remote pilotage would only be appropriate for ships of certain sizes and types, on which the bridge team are familiar with the route and do their own shiphandling. Research is under way to determine the minimum of extra information required and the technical means to transfer this between ship and shore. The trust issue would be countered by training members of the BT on RP on the simulator. This of course limits the number of ships/crews eligible for RP even further. This implies that whatever the model, there will be pilots joining certain, or even most, types of ships, requiring a system of boarding with pilot tenders or other means. This greatly influences the cost of pilotage.

A practical solution?

It is hard to determine the efficiency gains of SBP. In Amsterdam, SBP is subject to a lot of restrictions such as size of ship, experience of

captain, strength of tidal current and traffic situation. The lock has to be ready before the vessel enters the breakwaters, the boarding pilot has to be ready in the breakwaters. This last point has a big impact. Under normal conditions we are able to operate with one pilot tender. When pilotage is suspended for small ships and SBP is in effect, we generally need two: one for the pilot station outside, and one for the pilot station inside. All these restrictions lead to a reduction in the capacity of the infrastructure (locks, pilot service, etc). With the extra pilot on the VTS tower to provide SBP, and the extra tender, not to mention the effort required for training, all the gains of a smaller sailing distance for the tender to cater to SBP ships and the minimally shorter time that the pilot spends on board are offset. In fact, when I was part of the management, we came to the conclusion that in our situation, SBP is more expensive than normal pilotage. However, we can keep the traffic moving even in adverse weather, which is of course a great gain in efficiency for the port.

Some people ask 'If you provide SBP in adverse weather, why don't you provide it in good weather?' The sum total of the effects on the way of working, the extra complications, and the loss of efficiency show that SBP is not necessarily an attractive way of working if there is an alternative available.

I'm afraid that this article might come across as negative towards SBP. It is time to balance that. In all honesty I have to admit that on some really bad days, I don't mind so much being called for SBP. Hanging on a steel wire under a helicopter in pouring rain and with 30-40 kts winds also has its draw-backs…. But one of the reasons I'm able to act as an SBP and try to be 'virtually there', is because I know what it is like to be at sea under those circumstances. An SBP pilot needs to know what is going on on the bridge, on that type of ship, under the current circumstances, including limitations and distractions. Even if I forget momentarily, one remark from the bridge team helps me to remember. As mentioned before: this is vital to gain trust from the bridge team.

In The Netherlands we have been using SBP for over 30 years now and it has greatly assisted us in providing accessibility to the ports. SBP has proven to work for ships that have enough margin and captains that are used to operating in restricted waters. SBP needs pilots that are well trained in providing this service and who normally do on board pilotage so that they can calibrate their ideas with real life.

With the attention SBP is receiving now, new solutions can be worked out to improve the weaker aspects of SBP and I'm looking forward to these solutions. But to provide proper solutions, the proper problems need to be identified! I hope this article can contribute to that.