

## Chapter 4 – Tweeting operators

Figure 1: Screenshot of a tweet by operator Rolph, who calls himself “verkeersleider” in Dutch, someone who directs traffic. In this tweet from 13 February 2018 he writes: “Leisure ship mid fairway and with poor lighting! RWS71 underway.” The RWS71 is a patrol vessel stationed on Devil’s Island. Rolph has marked the ship which is approaching the intersection of the Oude Maas and the Dordtsche Kil with a red circle.



At times I was definitely guilty of hiding behind my note-taking in the field, not fully participating or observing because I was so preoccupied with creating a record. People in the field have commented on this time and again: it made them both suspicious and curious, and we usually ended up going through my notes together. Writing could be a way of dealing with my insecurity, but when I used my laptop it was also a way of participating in a field as permeated by screens and interfaces as inland navigation. Although the screen could also block my view, it seemed to be a way of not observing people too obviously. For a media scholar who later found his way into anthropology and ethnography, the screen seemed for a long time to be the sur-

face through which I studied the world. To speak with the dynamics of the field: in learning to see and listen like an operator or skipper—I clearly never became either, I just tried to understand how they observe their surroundings—I was more like the Rotterdam navy-radar-men-turned-operator than the inland navigation skippers-turned-operators. After learning about the existence of these control rooms, I was desperate to escape the confines of my office, tired of being a desktop scholar. Still, I struggled to get access to the field, so when I found out that the operators had started tweeting, I resorted to observing them online. At first it was clear that there was nothing ethnographic about it—the field was elsewhere.

To call this chapter a digital ethnography is a stretch. To say that my interactions with operators on Twitter amount to participant observation is also a stretch. Gradually, however, the various components of my research project began to bleed, adjacent spheres began to seep into one another. I realised that I was no longer just reading the tweets in search of a contrast to media archaeological studies of control rooms, which rely mainly on pop culture or the circulation by state actors, or to grasp Twitter's affordances and platform logic. Not only did I know several of the Rijkswaterstaat employees whose every tweet I read, but I also understood better which parts of their work they were showing. It became easier to read the screenshots they tweeted because I knew what larger context they were taken from (Figure 1). Conversely, as I found myself in control rooms more often, I realised that I could build on what I had learned from following operators online. In a sense, my control room interface literacy grew from both, though not in equal measure. Sitting next to operators for hours on end, and having them walk me through the capabilities and limitations of their various software applications during a lull, is unparalleled.

Without claiming that it was fieldwork, following the operators online felt like never really leaving the field entirely (cf. Abidin 2020). Although I was offline by default when working on my laptop, once a week I would follow the various accounts and take screenshots until I saw tweets I recognised from the previous session. As described in the first chapter, my interaction with operators via Twitter was tentative and remained so. This had to do with my own inhibitions, but also with the fact that I was getting to know other operators and skippers, mostly of an older generation, who prefer phone calls or text messages and are not on Twitter. Ironically, my real Twitter interactions with operators came when I was actually in the field. Just as they reported from their control room perspective, I tweeted what I had just witnessed, preferably in both text and pictures, just as the operators did. Perhaps writing it down makes it ethnographic again. At any rate, it is interspersed with other fieldwork experiences, both on board ships and in control rooms.

The operators' use of Twitter coincided with the 2015 conflict; not entirely prompted by it, but difficult to separate from it. This chapter analyses in great detail material that has never really been available before, and relates it to the actual work. The first section embeds the tweeting operators in the representational aspects of

how the 2015 conflict was broadcast. The second section analyses the tweets of control room operators in relation to how the organisation represented the workplace and what the work looked like during my fieldwork.

## 4.1. From broadcasting concerns to tweeting operators

As an intermediate step, we can briefly visit the television news and first compare it with how operators made their precarious situation visible to me during my first visit. I will then define the potential contrasting visibility that Twitter might offer and take a closer look at who I followed and whose tweets will be analysed in section 4.

### Retired operator speaks

The item was aired in February 2015 by the NOS, the Dutch public broadcaster responsible for newscasts on radio and television. It begins with an overview of where these control rooms are located (Figure 2) and what they do. It says that “almost 200 Rijkswaterstaat operators help ships navigate the complicated and busy places. The position of the ships is determined by radar and the skippers receive instructions via marine VHF radio.” (Parre and Hofs 2015) It is assumed that the general public, the millions of people who watch the prime-time news on a Sunday evening, do not know where these control rooms are and what they do, or at least need a reminder. The control rooms in Dordrecht, Tiel and Nijmegen are shown from the outside, and the latter accompanies the headline of the article on the much-read NOS website (Figure 3).

The item includes the operator’s perspective by interviewing a recently retired operator—a wise move, according to a senior policy advisor, as public statements by employees against Rijkswaterstaat are not accepted and could have led to dismissal. This is where Rijkswaterstaat’s hierarchical tradition meets its carefully controlled public image. In addition, operators are loyal to the organisation and it hurts them to speak out publicly against Rijkswaterstaat. Knowing this, the recordings made for this article in various control rooms, including Dordrecht, take on a different meaning. Although the operators initiated this report, they cannot do anything but sit at the console. They are not shown as they always are, in the sense that the camera position is not behind them, which would show the banks of screens more clearly, but one does not learn much about the work either. But on the banks of the Oude Maas, an oldtimer could speak for them:

The retired operator: For example, if there’s a major incident, then you’re really short, then you miss things and then you just can’t deal with it.

Journalist: Will that lead to dangerous situations?

Retired operator: It can certainly lead to unsafe situations.

(Parre and Hofs 2015)

*Figure 2: Still from the NOS item on understaffed control rooms, with locations of control room as yellow dots, with the the Tiel control room in the background.*



*Figure 3: Screenshot from NOS website; the article version of the same item. The headline reads “Safety on rivers at risk”. The photo of the Nijmegen control room is one taken by Rijkswaterstaat, and had to be taken not long before sunset because the light from the west makes the control room stand out. The flat Dutch landscape lends itself to such panoramic photo. Not much elevation is needed to make a control room stand out (in this case elevation is of course also a preventive measure for flooding).*



*Figure 4: Photograph taken in the Dordrecht control room of a filtered view of AIS information on a nautical chart of the south-west of the Netherlands which should depict the largely inactive Rijkswaterstaat fleet.*



A trade unionist is then interviewed, who explains that the shortage of control room staff means that patrol vessel crews have to stand in for them, and that as a result some patrol vessels hardly ever sail. The journalist is then filmed in the port of Tiel, with the moored patrol boat in the background, as he explains that it sits there most days.

The operators would have had another way of making this visible, which they showed me in Dordrecht in 2015, during my first visit (Figure 4). On a screen with the Narcis application open, which displays the AIS labels of ships on a map, an operator selected only patrol vessels and no ships. Only one of the vessels was sailing, the others were moored, as indicated by the direction of their bows. The ships are shown as black triangles, with a black line indicating the direction in which the ship is moving. Except for one, none were parallel to a waterway. This is the kind of operator's perspective, a privileged view that usually does not extend beyond the control room. When I saw that several of them were active on Twitter at the same time, I wondered if this was what they would show.

### What tweeting can do

In the aforementioned article, Lucy Suchman explained that she was in doubt whether “[m]aking work explicit, visible increases workers’ vulnerability to rationalizing agendas,” or if “[r]epresentations may become resources for workers’ own

use in negotiations with management.” (1995, 60) This was already the danger when Dirk van Zwijnenburg began to quantify his work in the 1980s. The data itself proved Zwijnenburg right and eventually contributed to better working conditions, but at the same time it legitimised a managerial way of representing work. That was an internal matter, but the use of Twitter goes further.

Much has been written about the promise and danger of Twitter (cf. Marres 2015; Weller et al. 2016; Tufekci 2017), not to mention the turmoil since it was bought, re-branded and even more radicalised in 2022. The promise of a bottom-up exchange of ideas and information, bypassing gatekeepers, contributed to the quantification of networked activity to prove this promise (cf. Passmann 2019). The honeymoon period did not last long, and as Twitter became more effectively used by actors with illiberal and destructive motives, the marriage between progressive politics and networked technology proved to be a sham. It is now commonplace to think that networked technology is not inherently emancipatory. This suggests that we should not expect too much from the operators of Twitter. Especially when you consider that the translation of interaction into metrics is right up the alley of Rijkswaterstaat, from the managers in the shipping department to the public relations officers in the corporate service. As Johannes Passmann has shown, the best way to understand this is through the tight coupling of circulation and infrastructure: “Twitter is not only a platform for the circulation of all kinds of messages; it is simultaneously an interface that makes this very activity explicitly visible. It is a highly reflexive infrastructure, as it automatically produces dynamic accounts of its infrastructural activity.” (2019)

As detailed in the previous chapter, Rijkswaterstaat wanted to become more public-oriented with its reorganisation in the 2000s. This also meant that it wanted to be able to address those whose lives were most directly affected by Rijkswaterstaat’s work. Through Twitter, Rijkswaterstaat can build more localised networks around specific “matters of concern” (Latour 2004: 4). Instead of, or in addition to, addressing the indiscriminate public, which is tied to the processes of legitimacy and accountability of the democratic nation-state, Rijkswaterstaat can now address targeted publics. In doing so, it can live up to its ambition to be less of a technical authority and more of an open partner. Moreover, by making much of the activity on Twitter “countable” (Passmann 2019), it is moving closer to the evidence-based paradigm that governs the managerialised organisation. No wonder that the Corporate Service actively encourages and structures the use of Twitter by operators.

The possibilities and dangers of making work visible, as Suchman pointed out, must therefore be considered both within the specifics of the medium used for this purpose and within the organisation in which this activity is embedded.

However, here too I am limited in my ability to consider the ongoing mutations of the platform, focusing instead on the practices of a very small group of users. However, there is some reason to believe that the operators’ Twitter activity took

place on a relatively stabilised platform (cf. Passmann 2016, 2018, 2019). The most important change that occurred during the time I studied the tweeting operators may have been the change in November 2015 from favs to likes, no longer indicated by the star symbol, but by a heart symbol (Passmann 2018: 14). It materialised as part of a much longer process in which particular practices of giving and receiving gifts through retweeting and favouring/liking were adopted by Twitter (cf. Passmann 2018: 355–6). Although I did not begin systematically recording tweets until 2016, after this change had taken place, I began reading their tweets from the summer of 2015 onwards. There were other changes to the platform, though significant in themselves, such as the removal of the 140 character limit per tweet in 2017, which seemed to make little difference to the practices I observed. As will become clear shortly, tweets by operators often combine images and text, and Twitter has increased graphical capabilities in recent years, making it easier to include more than one image in a tweet. It is beyond the scope of this thesis and the scope of the dataset, although I am reluctantly using this work, to assess exactly how these changes are reflected in the tweets, how some practices preceded these changes, or how Twitter has changed as a result of either.

### Who to follow?

I have never been present when an operator has tweeted, but we have discussed it, although not directly with Rolph. So on the one hand I rely on what they made public, but on the other hand I know many of the situations they make public. As mentioned in chapter one, I only explicitly followed operators on Twitter that I had met in the field. These are the operators Mark and Rolph, who happen to be the most active tweeting Rijkswaterstaat operators. Mark (Figure 5) worked in the Hansweert control room, which is located on the Western Scheldt where two fairways and the Zuid-Beveland Canal intersect. Rolph (Figure 6) still works in Dordrecht. The consequence of following them is that their tweets are displayed in my timeline, mixed with all the other people I follow, whereas I used a list provided by Rijkswaterstaat to read the other tweeting operators and river masters. The advantage of the latter was that I could easily compare styles and see if certain information was circulating within the network through retweets. The focus of the rest of this chapter is on the tweets of Rolph and Mark.

Mark had been active on Twitter, at least with this official account, since June 2015. His handle is @VLW\_Mark and his bio reads ‘Regioverkeersleider bij Rijkswaterstaat op Verkeerscentrale aan de Western Scheldt’, with contact details for the Rijkswaterstaat central office. His location is a link to the control room’s location on Google Maps, which is also shown in the horizontally cropped aerial photo at the top of his profile and in the background of his profile photo. No other Rijkswaterstaat control room is as isolated in the landscape as the one in Hansweert.

Figure 5: Screenshot of the profile page of operator Mark, who works in the Hansweert control room along the Westerschelde, taken in September 2016. Figure 6: Screenshot of operator Rolph's profile page taken in May 2016. Rolph works at the Dordrecht control room and is seen by his colleagues as their spokesperson. On occasion he also works on a patrol vessel too.



The Western Scheldt must be the widest waterway where the wind is unobstructed, which I noticed as I cycled towards it on an early autumn morning in 2016. Mark is a keen photographer, so he may have taken the aerial photo himself with a drone—he regularly posts drone photos. He had brought his own tablet, on which he showed his colleagues photos he had taken over the weekend of a vintage car he owns, and showed me photos of strange or dangerous situations on

the water as seen from the control room (Field note 17.10.16). He had also tweeted some of them. In his profile photo he is wearing a Rijkswaterstaat windcheater. In his profile photo, Rolph appears to be wearing his Rijkswaterstaat buttoned shirt, which normally has epaulettes. Operators have long been provided with uniforms, which they generally seem to appreciate. Towards the end of my fieldwork, there was talk of this being reduced for financial reasons to staff who are directly visible to outsiders, such as lock and river masters and their crews.

Rolph registered his account around the same time as Mark, in August 2015. His handle is also similar, @VLW\_Rolph. Operators are encouraged by Rijkswaterstaat's communication department (part of the Corporate Service) to use Twitter, and all operators and river masters have formal handles: function, then first name, separated by an underscore.

There are operators who tweet under a different type of handle and sometimes use their full name. Work is an important part of the content, but it is mixed with more personal content and hints at political beliefs, and sometimes participates in the general circulation of outrage, which is a prominent category on Twitter as on other social media platforms. Operators with official accounts largely refrain from this. They take a less outspoken role than one would expect from a civil servant. The private accounts are not included in Twitter's list of official accounts. However, the two types of accounts do exchange retweets and likes. You might expect the non-formalised accounts to contain more critical and outspoken tweets about work, but I have never seen anything resembling that. If anything, the formalised accounts, such as those of Mark and Rolph, do more to develop an alternative perspective on operator work than the private ones.

The horizontal image at the top of Rolph's profile page is a photograph of his main interface, with radar and AIS projected onto a chart. To the right is the triangular shape of Devil's Island and in the middle is the intersection of the Oude Maas, the Dordtsche Kil and the Krabbegemaal. The white rectangular blocks surrounded by blue are ships, with small lines between them and their AIS labels—although these are made illegible by keeping the photo slightly out of focus. This tells you that it is a photo and not a screenshot—the former is taken by a separate device, in Rolph's case a smartphone, the latter is what used to be called 'print screen', a feature of most operating systems that allows the user to capture all or part of the interface on the fly.

Since I took the screenshots of the profile pages, they haven't changed except for the aesthetic changes Twitter made to the interface between 2016 and 2020. What has changed is the number of followers. For Mark, these had increased from 771 followers and 84 followers in 2016 to 1202 followers and 123 followers in 2020, while for Rolph they had increased from 777 followers and 214 followers in 2016 to 1805 followers and 330 followers in 2020. What has remained relatively stable is the ratio of followed accounts to followers. These are not exactly broadcasters—not in the sense

that this word has been used since the advent of radio and television. But they are mostly engaged in sending messages, not in playful exchanges.

## 4.2 Localising tweets

In what follows, I distil five years of reading and documenting hundreds of tweets into six themes, grouped into three categories: what the tweeting operators did most persistently, what was significant but less frequent, what might have been expected but was hardly tweeted about. It is not often that tweets can be attributed to just one theme, especially the first two, which form a continuum. In addition, some elements run through the Twitter activity I witnessed: the sharing of the operator's perspective through carefully curated photos of fragments of the control room setup, and the emphasis on shift work.

To anticipate the main findings, on Twitter, operators structurally share the control room perspective, allowing followers to gain visual literacy. To communicate control, non-events are the goal. The construction of near misses as a category therefore legitimises the work of the operator and thus the control room. It helps to escape the prevention paradox, in which the successful production of safety and mobility by the control room raises the question of why a control room is needed if nothing bad ever happens. This is done mainly through the circulation of images, for which smartphones are crucial devices between the control room console and the public infrastructure. It is shown that operators are not only involved in making work visible, but in the work of visibility itself. Furthermore, motifs from the long media history of the control room are observed to resurface, suggesting a continuity rather than a radically new position of making control room (work) public. The degree to which operators are aligned with organisational interests can also be explained by the surveillance work of the communications department of the Corporate Service. Although the infrastructure is made public through Twitter and the platform allows for the infrastructuring of the public, it has not been deeply integrated into the daily and mundane organisation of (safe) mobility.

### Persistent

#### Protecting the public by maintaining order

In the first of the two themes common to most operator tweets, operators show their embodied control room perspective to demonstrate the kinds of situations they monitor, preferably without these situations ever becoming events, as the control room promises 'non-events'. Followers can gain a visual literacy of control room interfaces and a sense of infrastructure layout and use, and in turn a constellation of media that makes this visible, specific, local, can be deduced. However, in order

to fully understand the tweets, a certain amount of local shipping knowledge is required, so one of the audiences addressed is made up of nautical professionals. Particular attention is paid to the notion of near misses, as their documentation is used to fill the representational vacuum left by consistent safety without incident.

What stands out in general is that Mark and Rolph tweet a lot of images, as do their colleagues on the patrol vessels and skippers. Twitter has long been text-based, and significant Twitter networks develop around the appreciation of textual manifestations of wit and irony that provoke an exchange of likes and retweets (cf. Passmann 2018).

Mark regularly tweets photos of his main interface, in which radar and AIS are superimposed on a nautical map (Figure 7). Because of the repetition, one begins to see the opening for the Zuid-Beveland Kanaal at the top of the image and the 180-degree turn marked by the dotted lines and the lighter blue area in the middle of the image, which no ship ever crosses. It is difficult to determine when and how I learned to identify the various elements in this image, as I used a high-resolution map of the waterways in the Netherlands throughout my fieldwork, visited several control rooms along the Western Scheldt, and sailed the same stretch on board a tanker, the *Porter*. Nevertheless, I am confident that my visual control room literacy is largely based on seeing this kind of tweet and others that complement it. The Hansweert control room is on the right pier of the opening, as shown in the aerial photo on Mark's profile page. The lighter area is a sandbank and the dotted lines indicate the fairway. The white shapes on a blue surface are the ships, with a white line indicating the direction they are heading. Those on the (lower) right are heading east, south-east to Antwerp, those on the left west, south-west to either Ghent via Terneuzen, the port of Vlissingen or the North Sea.

*Figure 7: Screenshot of tweet by operator Mark from 2016 showing his integrated interface of radar, AIS and digital chart. Figure 8: Another tweet by Mark, from 2019, which is liked by the author, as the red heart indicates.*



In this tweet from October 2016, Mark writes: “Nice evening shift, still quite a few ships at the door #hansweert @binnenvaart @varendoejesamen”. What he does here, and in many similar tweets, is indicate that he is keeping an eye on things without explaining exactly what is happening or showing any particular event. He adds the rather small town of Hansweert, outside of which his control room is located and named after. By prefacing it with a hashtag, he is indexing the tweet and linking it to all other possible tweets with the same hashtag, which cannot be too many, given how small the town is. He mentions two accounts; the first, @binnenvaart, is linked to a website called [binnenvaartlog.nl](http://binnenvaartlog.nl), which collects inland navigation news from other specialised publications. The site seems to be run by a hobbyist, there are no advertisements. Updates on this website are automatically tweeted. It is unlikely to be retweeted by @binnenvaart, which has a few thousand followers. It is mainly aimed at professional skippers. The @varendoejesamen is part of the “Varen doe je samen” campaign, which is funded by the main stakeholders in inland navigation, from industry to government agencies, including Rijkswaterstaat. It translates as “Sailing is done together” and aims to inform non-professional waterway users through public events, the provision of educational material and a navigation app it has developed. The account @varendoejesamen is an enthusiastic retweeter of Rijkswaterstaat’s nautical tweets.

Mark (and Rolph even more so) often mentions which shift he is working. In a tweet from June 2019, he writes: “A nice quiet day shift @varendoejesamen” (Figure 7). The shift itself is often not the main topic communicated, but including this information so frequently makes control room work explicitly shift work and implies a physical element to the work that is never communicated about control rooms. The length of shifts, the intensity of shifts, including the possibility of downtime during a shift, the individual sequence of shifts from early to late, and a guaranteed minimum number of days between a night shift and an early shift have all been contested over four decades of control room work. So when something that is so central to the work, and so contested, and yet remained invisible for so long, is made structurally present, it is a significant change.

In other tweets, about cycling or jogging, Mark and Rolph also make fitness an issue. Although I have never seen them tweet about food or eating, I know from being in the control room that it is an issue: operators sit still all day and know that drinking too much coffee with cake or biscuits on the side is a trap. I used to bring both when I was in the control room, which was to some extent expected and certainly appreciated, but operators were careful not to indulge. In this respect, control rooms are not very different from wheelhouses: here, too, skippers were conscious of gaining weight and eating unhealthily while sitting in a chair most of the time.

The same tweet from Mark was accompanied by a photo taken from the control room, with the piers on either side of the mouth of the Zuid-Beveland Kanaal just visible on the left and right (Figure 8). Two barges can be seen entering the mouth of

the canal, and a seagoing container ship and a barge are on their way to Antwerp via the Western Scheldt. Again, there is no particular event to report or announcement to make. Anderson and Gordon (2017) write about the promise of control and “non-events”, based on Gordon’s fieldwork in motorway control rooms. The idea is that “[c]ontrol is precisely what is placed in question, disturbed, by events.” (2017: 160) So for Mark, reporting a non-event means that he is in control. In that tweet, there is a lot going on in Hansweert, on his doorstep, but it does not yet become an event.

*Figure 9: Screenshot of a 2018 tweet by operator Mark, again liked by the author. A sailing regatta took place on the Westerschelde. Two Rijkswaterstaat patrol vessels, the RWS 78 and 79 were involved in the coordination. Figure 10: Operator Mark finds the convergence of traffic right in front of the Hansweert control room somewhat uncanny.*



Most events are reported after the fact. In a tweet from late October 2018, Mark writes about an extraordinary amount of traffic during a sailing regatta in the past tense: “everything went well” (Figure 9). Only after he has established a visual norm of the normal amount of traffic over the course of many tweets does he really show how much traffic there is. He also thanks his “colleagues on the RWS 78 and RWS 79 @Rijkswaterstaat for the extra assistance”, indicating it was outside the bandwidth of traffic he can control himself. For those in the know, for those who follow Mark long enough, the sailing regatta tweet can also be a spectacle. On a more ordinary day, it can also be busy, but requires a trained eye and some framing by Mark, as in his September 2016 tweet (Figure 10). This shows roughly the same section of his interface. “Sometimes it just looks like magnetism,” he writes, which matches what he said when I was there and it suddenly became busy on the water: “They sometimes say that a giant magnet was buried here.” (Field note 17.10.16) It is likely that it is not just the amount of traffic that makes Mark say this, but the intersecting ships: two ships are heading for the mouth of the channel, while three ships are heading west. The two ships come in before the three, which has to be agreed by VHF radio between all the ships involved, which are travelling at very different speeds. On the

Western Scheldt, a seagoing vessel can travel twice as fast as an inland vessel. In this situation, there seems to be a large seagoing vessel involved, sailing in the middle of the fairway.

Figure 11: A 2018 screenshot of a tweet from operator Rolph, reporting on a collision between two tankers. Figure 12: Operator Rolph tweeting an image of the P2000 emergency system. Figure 13: Here, in another tweet from 2016 Rolph uses the hashtag #VTS, the international abbreviation for nautical control rooms, and writes about the increase in traffic due to low water.



Rolph also reports on events after the fact, but combines this with more variety in what he makes visible of the control room setup. Visually, he combines interface details explicitly tied to the circumstances with the kind of zoomed-out images familiar from non-operator representations of the control room. In November 2018, he tweets (Figure 11):

Night shift 3/3. Handing over the watch took a bit longer due to a collision between two tankers #NieuweMerwede. Luckily no wounded. Both ships docked in #Werkendam. Investigation by @POL\_zeehaven and @ILT\_scheepvaart, @OVDW\_Peter and RWS71 on site.

Rolph is doing his final of three night shifts. The use of hashtags in combination with geographical locations—the river where the incident took place, the Nieuwe Merwede, south of Dordrecht, which is not covered by either the CCTCV network of the control room or the radar network—indexes the tweet along with all the other tweets referring to the same hashtag, which, as with #Hansweert, cannot be many, but perhaps clusters the tweets about the incident. He mentions the accounts of the port police and the state inspector of shipping (who investigates every nautical incident) and ends with his colleague Peter on the patrol boat RWS71. The large screen is hanging at the desk where such incidents are managed, which otherwise is less intense and used to recuperate. The nautical map does not depict the river where the incident took place nor the harbour where the ships are now, but instead the double intersection that the Dordrecht control room monitors.

In May 2019, Rolph writes that the RWS73 pulled a drowning person out of the water “super fast”, a person who “capsized with a canoe”, adding the location: “#HollandschDiep” (Figure 12). In the picture below, the text on the display reads “vessel capsized”. By reporting the event after the fact and linking it to a successful intervention, it demonstrates that even when things are not normal, these authorities can restore normalcy and the safety that comes with it. However, by depicting the distress call as being displayed in the control room, it implies that the RWS73 patrol vessel was sent there by the operators, and is consistent with the way in which vessels are centrally directed and operate in a reactionary manner with the advent of the control room. However, it is unclear whether the control room was involved in directing this intervention. In the collision between the two tankers (Figure 11), the idea of the control room as the place from which events are monitored, as the centre of coordination, is also implied by the map Rolph tweets, the summary he is able to give, and the various actors he mentions. As for the capsized canoe (Figure 12): the Hollandsch Diep, where this took place, is a waterway beyond their radar or CCTV coverage and the patrol vessels are also hooked up to the P2000 system.

This is a one-way mobile communication system whose messages are received by all government emergency services, including on pager-like mobile devices. It has three levels of priority (“Prio”), with 1 being the highest. The system is unencrypted and there are many amateurs monitoring it, for example by automatically forwarding it via Twitter. After the 112 centres switched to a digitally encrypted frequency, hobbyists were no longer able or allowed to listen in with VHF scanners. It seems like the P2000 system became an alternative system to monitor. Only once did I see Rolph directly retweet such a P2000 message, which made me realise that he also follows such amateur relay accounts, even though they have such a display in the control room for all to see. This could mean that 1) he follows these events when he is not working, 2) he may be a hobbyist or a professional with a sense of duty that outweighs his time on the clock, but 3) it at least suggests an online continuum between hobbyists and professionals.

Rolph tweets more photos of CCTV monitors (Figure 13). In general, the Dordrecht control room relies much more on CCTV than the Hansweert control room. The Western Scheldt estuary provides an open horizon, whereas in Dordrecht all the buildings on the riverbanks, the winding rivers and the large railway bridge spanning the Oude Maas interrupt a direct field of view. In October 2016, there is a lot of activity due to the low water level of the rivers, which is “very noticeable”. There are six ships in the fairway, two are moored to the left. For those familiar with Dordrecht and its waterways, it is clear that this is seen from the railway bridge over the Oude Maas, with the eastern tip of Devil’s Island visible in the top centre of the photo. The two larger of the six ships, lying behind each other, are waiting for the bridge to open. The first, with the red deck, is a seagoing vessel (higher bow), the second is an inland waterway container ship with a raised wheelhouse to see over the containers

it is carrying. Both are so high that even at low tide, when the distance between the water surface and the bridge floor increases, they still need a bridge opening. The three ships on the right are all sailing, as indicated by the wake of white water directly behind them. They are on course to pass the bridge through a part that does not open. The bridge does not open very often because of the heavy train traffic between the north-west and south-west of the Netherlands, so it is likely that there are ships on the other side waiting for a scheduled opening. With these ships, who lie waiting on the other side, the three we see that are about to pass the bridge need to pass starboard-starboard, which requires extra attention.

So to understand how busy Rolph and his colleagues are, you need at least a sense of traffic at off-peak times, which you can get by following Rolph on Twitter over a longer period of time. But more than counting the number of ships, to more fully appreciate the particular situation, local shipping knowledge is implied.

As a shortcut, both Rolph and Mark zoom in on the situations they see, making it unnecessary to read the overall situation, unnecessary to connect the representation with the local infrastructural configuration. For example, Mark tweets, “Strong wind and current. (...) luckily it ended well in part because the sea vessel going downstream altered course,” and adds a photo of two white shapes on a blue background relatively close (Figure 3.40). Identifying these as ships is not difficult, and you will quickly learn that the direction of travel is indicated by a white line extending from the bow, and that dotted lines mark the fairway. Also, sea ships are usually larger, so the smaller ship should be the one changing course. The smaller ship should be more to starboard, so that is the one drifting to port. So far it is quite simple. You could take it a bit further: being pushed to port here means that the wind is coming from the left, and possibly the current. The wind usually comes from the sea, west, south-west, especially strong winds. As the Western Scheldt meanders from east to west and the ship is being pushed to the east, also by the current, this could mean that it is high tide. The ship is tied to the waterway, as we learned in chapter two when the Dordrecht operator and the pilot of the *Jaroslav* got into an argument. This means that in this situation there is not much room left for the vessel to move further to port. However, it is not necessary to infer this much from the photo Mark tweeted to make the picture understandable.

The detailed photos of interfaces—the reflection of light on the screen tells you it is not a screenshot—report on dangerous situations. The example above, where the circumstances may not exonerate the skippers involved, but at least mitigate their responsibility, is an exception. Most of the time, Mark and Rolph report situations caused mainly by human error. Sometimes these can be explained. For example, a skipper may be on the wrong frequency or otherwise unavailable to communicate (Figures 15 and 16), making coordination impossible and an early warning ineffective.

Figure 14: Operator Mark (top left) writes about how the wind and current brought two ships dangerously close. Figure 15: Here, (bottom left) operator Mark mentions that a skipper was not available on the right frequency, “with luckily a good outcome”. Figure 16: In a 2018 tweet (bottom right) operator Rolph includes a clip of a dangerous situation on the Oude Maas, which “luckily ended well”. Figure 17: Rolph (directly below) uses the term “near miss” in a quote tweet.



These types of situations are the most eventful non-events. There was no accident, nobody was injured, but it was risky. In the field, there is a special category for this, called a near miss. A slightly confusing term, as it actually implies a hit. Near collision would make more sense, but this is what stuck, and is studied in aviation (cf. Thoroman et al. 2018), railway (though mostly called ‘running a red light’ or ‘signals passed at danger’, cf. Taylor and Lucas 1991), sea shipping (cf. Zhang et al.

2016; Westeren and Ellerbroek 2017). In the maritime world, which overlaps with inland navigation in ports such as Rotterdam and Antwerp, near misses are registered as incidents and evaluated by authorities. The International Maritime Organisation (IMO) defines them as a

sequence of events and/or conditions that could have resulted in loss. This loss was prevented only by a fortuitous break in the chain of events and/or conditions. The potential loss could be human injury, environmental damage, or negative business impact (e.g. repair or replacement costs, scheduling delays, contract violations, loss of reputation). (IMO 2008)

The element of luck is literally present in all the tweets (Figures 14 to 17); the claim that the operators prevented an accident is rarely made.

Rolph explicitly uses this term on Twitter (Figure 17), Mark does not, but it was used in almost every control room I visited. It makes describable what would otherwise disappear because there was no accident. It is a crucial concept for control room accountability, both internally and externally. In a way, it legitimises the control room without the need for an accident. The promise of control through the pursuit of the non-event, if successful, leaves a vacuum. This is similar to the concept of the “prevention paradox” as it has re-emerged during the pandemic. Originally an epidemiological concept from 1981 (Rose) to describe the contradiction between individual and population prevention strategies in medicine, it has been used differently in the popular discourse on Covid-19 prevention. It was “used to describe the apparent paradox of people questioning measures to prevent the spread of the pandemic because the predicted spread did not occur”, according to the then recently edited Wikipedia page (2020). In the case of the inland navigation control room, its necessity was indirectly questioned in the way the minister justified the reduction of the control room staff, as discussed in the previous chapter. The actors involved in setting up the control rooms in the 1970s and the official documents mention unsafe situations as the volume of traffic increased. The absence of serious incidents since then could be attributed to control room coordination, or the absence could be attributed to something else (increasingly well-equipped control rooms) and used to question the very legitimacy of control rooms.

This view is shared by some of the skippers I have met. Rob, skipper of the *Liberty*, for example, made the comparison with German waterways, where crossings are not coordinated, and he thought things were fine (Field note 29.11.16). In comparison, Germany has many fewer crossings and not as much traffic. Some stretches along its main waterway are hazardous, and there it does intervene, more stringently than the Dutch state. On a seven-kilometre stretch of the Middle Rhine, between Oberwesel and Sankt Goar, traffic is controlled by traffic lights. Since the 18th century, various state-funded bodies have been active on this stretch of the

Rhine—see the *Wahrschautürme*, discussed in the first chapter. Today, the Oberwesel Revierzentrale uses a land-based radar network and marine VHF radio to centrally control five signalling systems to regulate traffic through a series of bends with shallow water and strong currents, where steep rock formations hamper radio communication between vessels (Figure 18).

*Figure 18: Photo of two ships navigating a dangerous stretch of the Mittelrhein, taken from the Liberty in November 2016, looking upstream. On the right bank, the three horizontal lights indicate that no vessels are coming downstream.*



At the time the control rooms were built in the Netherlands, it was expected that the increase in speed and size of ships and the growth of the fleet would not be possible without them. This is not exactly a prophecy, yet it is productive here to look at the self-defeating prophecies. Unlike self-fulfilling prophecies, the accuracy of the prediction has a preventive effect:

a self-defeating outcome invariably involves a degree of voluntariness and some aware actions, as the result of a correct understanding, by the actors, of those causal mechanisms that are at work in the production of predicted effects. In fact, the prediction failure is a consequence of the renewed intentions of the subjects, who modify certain aspects of their behavior in response to the new awareness, preventing the predicted future state from happening (...). This new awareness is caused by the prediction itself and is related to its validity: if the subjects had

not been familiar with the prediction, it would not have been undermined—that is precisely why the prophecy was initially true (Sabetta 2019: 55–6).

A self-defeating prophecy is therefore positive in itself. The fact that the growth of inland navigation has not led to an increase in accidents reflects positively on the primary preventive measure taken by Rijkswaterstaat: the control rooms. However, it could also appear that the operators are being left empty-handed.

### **Educating recreational skippers by showing the control room perspective**

In this theme these near misses play a prominent role too: they are used to educate and warn leisure skippers. However, it is not hard to see that they are also communicating that local order is being maintained, again by showing specific screenshots from their main control room interface. This also points to the prominence of the visual and the absence of the acoustic dimension that is otherwise so dominant in everyday control room work. This is explained not only by the crucial private role played by operators' smartphones, but also by the fact that, in addition to making work visible, operators are also engaged in visibility work, which primarily serves organisational interests.

Rolph also translates the term into Dutch, a “bijna aanvaring” appears in his tweet from August 2017 (Figure 19). At the intersection of the Dordtsche Kil and the Oude Maas, a seagoing vessel and a pleasure boat almost collided. In his interface, the direction of the ships is not shown by a line from their bow, but by an animation of their last route. So the small boat that crosses the red dotted line is heading west, downstream on the Oude Maas, just ahead of the seagoing vessel that Rolph explains is “heading for the Krabbegeul”. This is a double right turn, almost 180 degrees. What is a red dotted line in this tweet is a white dotted line in an older tweet by Rolph, from September 2016 (Figure 20). After mentioning that he started his second of three late shifts early, Rolph gives an explicit warning, followed by an order: “The leading lights are meant for sea shipping! Keep starboard side #VTS”. These lines indicate the deepest part of the shipping lane and is indicated on digital nautical maps, which apparently the leisure ship is following. In the original Dutch, the command includes an abbreviation for starboard side, suggesting at least some nautical knowledge on the part of the recreational boaters being addressed. However, it could also be the practice of brevity allowed by the limited number of characters per tweet in 2016, although he is on the safe side of the 1400-character limit with 107 characters in this tweet. In another tweet from August 2016 (Figure 21), Rolph also uses a commanding tone: “Keep to starboard as much as possible and look over your shoulder often.” But more than just a command, combined with the careful selection from his vast interface, it also becomes quite dramatic, showing Rolph's narrative skills. One can see how the skipper on the leisure yacht might feel like he is the only one on the river, ignorant of what is creeping up behind him.

Figure 19. Screenshot of a 2017 tweet by operator Rolph about a “bijna #aanvaring” (near miss) at the intersection directly in front of the Dordrecht control room. Figure 20: Rolph tweets in 2016 about a late shift where a recreational skipper failed to keep to the starboard side, which he has circled in red. Figure 21: Rolph warns leisure skippers to keep to starboard and look over their shoulder in a 2016 tweet.



Figure 22: Tweet from 2019 by operator Mark about a yacht crossing too close, which was warned on his instigation through the seagoing vessel's horn. Figure 23: Also in 2019 Mark writes that he told a little yacht (“jachtje”) to wait for downstream traffic before crossing the shipping lane.



Sometimes, in their tweets about a narrow escape, the operators describe what they did to prevent an accident. For Mark, the seagoing vessels and the leisure yachts form the two ends of the speed spectrum, with the former being the fastest and the latter the slowest. In and around Dordrecht, sea ships take it easier and regularly need tugging boats to manoeuvre. In July 2019, Mark tweeted (Figure 22) about a yacht that “passes too close to a seagoing vessel and is unavailable on marine VHF

radio” At high tide, yachts are not restricted to the shipping lane, as seagoing vessels always are, so the small vessel in the centre of the photo could be heading that way. Recreational yachts are not required to listen to the local frequency, and although they often have marine VHF radios, they often do not know which frequency to tune to. Rolph’s commands may also be due to poor communication with them: he may not be able to give them commands over the marine VHF. Also, pleasure craft are not required to transmit an AIS signal, as the vessels in Rolph’s tweets and in this tweet from Mark are not doing, as indicated by the absence of a label with an abbreviation of their name. The ship does have a label, but Mark made it illegible for this photo.

He continues to write that he “asked the sea ship to give an audible signal, after which the yacht quickly altered course.” As much as these Twitter practices bring to light previously hidden visual elements of the control room, the acoustic dimension of both the control room and the traffic remains absent. Here, Mark invites the reader to imagine this dimension: a yacht dwarfed by the seagoing vessel, unlikely not to have noticed it, yet not in contact with the seagoing vessel either directly or via the control room, and apparently unaware of how the seagoing vessel is moving. The yacht is absent from the shared acoustic space that is the marine VHF radio. The ship’s horn is a shortcut, now it becomes clear that the yacht and the ship do share an acoustic space.

It is exceptional when a tweet gives a concrete idea of what the operator said when he intervened. In April 2019, Mark tweeted (Figure 23): “Told upstream sailing yacht to come back to starboard and cross to SvV behind 2 seagoing vessels going downstream. @varendoejesamen”. It took me a while before I figured out what ‘SvV’ stands for, which suggests I am not local enough to be targeted by Mark, or that following Mark on Twitter is an invitation to become more local. SvV stands for Schaar van Valkenisse, a ‘schaar’ is a tidal channel, and this one is available for navigation by non-seagoing vessels. The two seagoing vessels are coming from the bottom right, off centre. Both have an AIS label, the yacht has a label for this tweet. In yellow it says “jachtje”, little yacht. The different speeds are again alluded to: the yacht has to let the ships pass, even though the yacht is closer to the dotted line—the boundary of the shipping lane, behind which the tidal channel lies—than the two ships.

The contours of an acoustic representational vacuum have become apparent in the screenshots of the tweets discussed here. Given how prominent the acoustic dimension is in everyday control room work, its absence is striking. The core task of the operators is to monitor the traffic, inform the skippers of the situation and agree complex passing arrangements with all the vessels involved—the latter two tasks being carried out via marine VHF radio. The combination of keeping an eye on all relevant movements and translating them into concise messages over the frequency is central to the training, as far as I have been able to observe. Skilled operators are masterful at withholding distracting information, and using phrasing and tone alone to get a skipper to agree to a particular movement.

The absence of the acoustic dimension in the control room work made visible has its roots in different parts. There is the simple restriction of not being allowed to include ship names. As can be seen in many of the figures used in this section, ship names are not allowed in the photographs. Dutch law prohibits operators from making this public, generally for privacy reasons, and in the case of near misses, operators, as representatives of the state, cannot publicly accuse skippers of irresponsible behaviour. Omitting this from an audio recording is more laborious and quickly results in something less intelligible.

*Figure 24: Screenshot of a 2016 tweet from Jaap, whom I met during the simulator training in Hoek van Holland. The control rooms of the port of Rotterdam are known to be better funded and therefore better equipped. From the stories he told I take it he sailed before, either at sea or on the Rotterdam waterways. As explained in chapter two, most Rotterdam operators have a background as radar operators on a sea ship. In the cohort Jaap was training, in which future Rijkswaterstaat and Port of Rotterdam operators are mixed, the two men destined for the port had been in the navy.*



**VTS.Jaap** @JAvDrongelen · 14 aug.

Tijdens middagdienst op de VCR alle middelen worden gebruikt om het scheepvaartverkeer te monitoren



Telling a story without the names of ships is still easily done visually, and the role of the smartphone in the habitual media assemblage of shipping culture makes this possible. Everyone now carries a smartphone, so much so that its ubiquity has obscured its impact. For operators, having an additional, relatively independent and adaptable device lying around changes the dynamics and reach of the assemblages they are able to forge with other actors. The ad hoc recording of work situations has its practical advantages, also internally. An operator of the Nijmegen control room showed me two pictures on his smartphone, one of his interface, where a ship was turning right in front of the control room from the river onto the channel southwards, the next a photo of his view taken directly after the first with no ship visible at all. It was a ghost ship (Field note 6.12.15). It emphasised the need to be able to look outside, and in that sense the issue of direct view on the water was mobilised for the enduring struggle of operators as discussed in chapter two, but more mundanely, these photos were immediately forwarded to the developer of the radar software. To capture the bug convincingly, a third position between console and operator was advantageous.

Jaap, then an operator in the port of Rotterdam, tweeted a picture of himself taking a photo (Figure 24). The 2016 tweet is accompanied by the text: “During day shift at the Rotterdam traffic centre all means are used to monitor shipping traffic.” The photo is likely staged, with someone being asked to take a photo of him taking a photo of a CCTV monitor. It seems to justify the presence of private mobile devices, a topic not without contention, as will become clear in the next chapter.

The radar and AIS data, as well as the interaction with the ship’s VHF radio, are constantly recorded, but the visually based material allows for much quicker reuse. From behind their consoles, operators can quickly rewind to see a particular situation again, even if they want to tweet about it. Only twice have I seen operators in Tiel rewinding an audio recording:

Upon arrival I see how Adrien [a former operator, now nautical advisor] and Niels [operator] listening to a tape one floor below the control room. There was a collision at six o'clock. A moored ship floated onto the waterway after a cable broke. An approaching skipper was warned, but it still went wrong. Niels comes up first, Adrien later, he gives his version of events, only informally he says he does not want to get involved and will give evidence later. (Field note 4.11.16)

This was an exceptional situation. The other time, an operator needed an instant playback because he did not hear or recall the name of a ship (Field note 6.12.16). Marine VHF radios also allow this, but only at the speed at which it was recorded so that it remains intelligible, as opposed to the rewind, scroll and fast-forward that visual interfaces allow.

Twitter itself is part of the answer: through established practices and design, it is much better at distributing visual material than audio recordings. In general, apart from the popularity of podcasts as a denser acoustic form, and the small-scale, more direct exchange of audio messages through services like WhatsApp, visual material is more widely distributed through networked devices—see, for example, Instagram, TikTok or YouTube (though often audiovisually, visually dominant, rarely just audio).

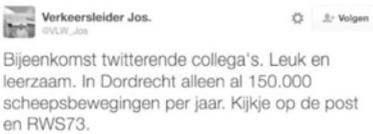
This brings us to a more fundamental point. The Twitter activity of Rijkswaterstaat’s control room operators, and also of Rijkswaterstaat’s patrol boat crews, is not exclusively used to represent their work. It is also a kind of work in itself, the work of making things visible. Here, the communications department of Rijkswaterstaat comes in, part of the Corporate Dienst. Of course, the communications department produces material that promotes Rijkswaterstaat work—it has its own drone team for instance to capture large infrastructural work—and plugs this at traditional news media. Yet, since it self-identifies as network manager and wants to connect to local infrastructure publics, who better to mobilise than those doing the infrastructuring?

Over the past few decades, large publicly funded organisations have expanded their communications departments while the budget for what used to be the core activity of the organisation has diminished. Universities are certainly no exception. Rijkswaterstaat used to build and maintain infrastructure. As its focus shifted to the use of infrastructure, it became more concerned with public perception and could not rely solely on the authority of engineering expertise. With the rise of the manager and the focus on cutting costs, the control room, which had initially been a model of behavioural change, was also identified as expensive. While skippers are increasingly able to navigate without the assistance of the control room or patrol boats, these Rijkswaterstaat crews have been given a new task: to manage relations with a variety of publics and to ensure that Rijkswaterstaat’s side of the story prevails. They are perfect for this job, because they are one of the few people still out there who are not tied to a desk in a generic office building. They have something to show.

To this end, there are training days for Rijkswaterstaat employees who are active on Twitter. Best practices are shared (Figure 25), marketing gurus give talks (Figure 26) and Twitter activity is quantitatively evaluated (Figure 27). The communications department has a dashboard to monitor the Twitter activity of Rijkswaterstaat employees (Figure 28). The employees are aware that they are being monitored. Mark once received a call that his tweet was inappropriate and deleted it—he refused to say what it was about—and was completely fine with it (Field note 17.10.16). Operators are now the ones being watched by someone else who keeps an overview preventively. The communication department has partly moved from addressing the public to monitoring those who do so.

This explains the other two categories and the way in which they appeared.

Figure 25: Operator Jos, who mainly works on a patrol vessel, in this 2017 tweet (top left) mentions the annual Twitter meeting and the “do’s and don’t’s [sic]” participants were told about. Figure 26: Top right: Cor Hospes—“content marketing & storytelling strategist”—writes he gave a talk at the 2016 Rijkswaterstaat Twitter meeting. Figure 27: A tweet from Jos on the 2016 Twitter meeting, which included a tour of the Dordrecht control room. Figure 28: Photo (bottom right) of the Rijkswaterstaat “Dashboard” as tweeted by road inspector Wilco in 2016. He writes: “here on the big screen all tweets are gathered.”



## Significant but less frequent

### Symbolic legitimacy

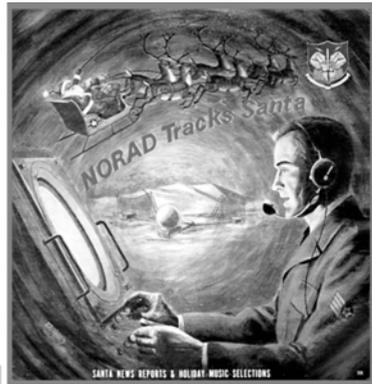
Public legitimacy and popular culture, I argue, form the outer ends of a continuum that influences how infrastructure work is done. Thus, this continuum is not merely symbolic, but is made up of practices that not only affect the work, but are an important part of the (control room) work (in this case). This then extends Suchman's aforementioned idea that organisations are made up of representations of work beyond spreadsheets, schedules and annual reports, widely recognised representational genres for organisations. Whenever one looks beyond these genres, things become more elusive. Control room work exists outside the realm of control room representation, which is a century-old tradition. In the vast and chaotic circulation of references, it is hard to pin down exactly how it works. But there are times when you catch a reference for the second and third time. This requires persistent study, and in the case I am about to present, over a decade of scholarly interest in the history of mediated control comes together. This is not to say that history repeats itself; it is not a matter of looking through the right lens and catching the same phenomenon in its orbit at the right time. It's about how things are reused, how some efforts in media history and popular culture are persistent and yet different.

In late November 2015, Rolph tweeted a fairly typical representation of a ship's radar: concentric circles, a radio beam, and a located ship as a fluorescent green dot (Figure 29). The tweet reads: "Yes, it's really true! Colleagues from @Rijkswaterstaat VTS centre #Ouddorp have spotted him! He is on his way! #sint #Maassluis". To understand the significance of this tweet and other similar tweets (Figures 31 and 32), two traditions need to be introduced: the Dutch holiday of St Nicholas and the way in which the US military interfered with the related North American tradition of Santa Claus.

The Dutch St Nicholas holiday, Sinterklaas in Dutch or simply Sint, is celebrated on 5 December. One of the main events in this tradition is his arrival by ship in the third week of November with his helpers, all called Piet—until recently called Zwarte Piet, Black Pete, and played by black-faced people. Sint is dressed as a bishop, a tradition that dates back to Nicholas of Myra, a bishop in Asia Minor in the 4th century. Nowadays the story goes that he comes from Spain and travels to the Netherlands to bring gifts to children who have behaved well. When he arrives, the children put out their shoes with carrots for his horse and are rewarded with small gifts in the run-up to 5 December. At night, a neighbour usually knocks on the door, runs away and leaves a basket of presents, implying that Sint and Piet have left them there. In terms of cultural significance, the whole tradition dwarfs Santa Claus in the Netherlands, and the gifts placed under the Christmas tree are far from ordinary. As early as September, shops start selling all sorts of Sinterklaas-related items, along with a whole range of traditional sweets and pastries. There is a daily children's Sinterklaas

programme on public television and his arrival is a live event. Each year one city is chosen to host the event, which attracts huge crowds, but in reality he arrives everywhere: every city stages its own arrival, every school is visited by someone dressed as Sinterklaas.

Figure 29: 2016 tweet (top left) from Rolph, claiming to have spotted and tracked Sinterklaas. Figure 30: To the right: sleeve of promotional record celebrating the 10th anniversary of NORAD Tracks Santa in 1964. Figure 31: Tweet by operator Mark (bottom left) from 2016, including a photo of Sinterklaas on board of a Rijkswaterstaat ship. Figure 32: In 2017 (bottom right) Rolph reported on the arrival of Sinterklaas in Dordrecht.



Since 1955, “NORAD Tracks Santa” has been the US Air Force’s annual public relations event (Figure 30). NORAD is the main control room for the US Air Force, the one from which it would direct a nuclear war, and the one that is hacked by a teenager in WARGAMES (Figure 11, chapter two). The idea is to keep children up to date with Santa’s journey from the North Pole. Since 1981, children have been able to call in to find out where Santa is at any given moment, a service that relies on volunteers.

Control rooms are actively inserted in such cherished actions of collective make-belief through their reputation for early detection and tracking. It shows parents that these very serious places, of course the NORAD control room in the Cold War much more so, can also be playful; it shows children that there is a place that monitors things and therefore knows exactly, not the ‘soon’ or ‘near’ estimates that their parents deal in. It gives credibility to both the story and the control room itself.

The important difference between NORAD tracking Santa and Rolph and Mark tracking Sinterklaas is the scale on which they operate. NORAD patrols an airspace that spans a continent, it has to convince a nation that there is a powerful place that is always on guard, it has to legitimise a government as vigilant and capable. Rolph and Mark are control room operators, monitoring nearby waterway crossings from their respective control rooms, trying to convince local residents that there is not just a place, but someone keeping an eye on things, thus legitimising Rijkswaterstaat on the ground. In his first tweet (Figure 29), Rolph has no choice but to add a fictitious radar image: he claims that Sint is still at sea, which he cannot see from his control room, but from his colleagues in the maritime control room in Ouddorp, whom he invokes. In later tweets (Figures 31 and 32), he and Mark report on a local arrival and can rely on direct sight (Mark) and CCTV (Rolph). In Mark’s case, Sint and his P are actually transported by a Rijkswaterstaat patrol boat. Rolph informs the mayor of Dordrecht that they have “already detected” Sint and his crew on the Oude Maas. Because the arrival is actually staged, they can report on it with their images, which are indexical, unlike how NORAD has to represent how it tracks Santa Claus.

There is no grand design here. I am sceptical about Rolph and Mark’s knowledge of the NORAD tradition. Of course, it could have been initiated and co-ordinated by the Corporate Service people. What recurs here is the quest for legitimacy by aligning the control room with cultural phenomena with deeper roots. It shows that control rooms are concretely and actively engaged with popular culture and tradition, and not just imagined in films, TV series and video games.

### Affective and spectacular

These tweets about Sinterklaas also fit in the larger theme of affective and spectacular tweets prominent in Rolph and Mark’s tweets, as in the tweets of their colleagues (who as a matter of fact also join in on Twitter when tracking Sinterklaas). These come in roughly three different forms: tweets about accidents, sunsets and over-sized ships.

The first category tends to be covered by river masters (Figure 33), or mobile traffic operators as they are now called. This includes saving a drowning person or recovering remains (Figure 34). They do not report this in a sensationalist way and seem to suffer from this type of work. Control room operators are more involved in coordinating the preceding search. Here, the tension associated with the deployment of different emergency teams and the time-critical task is clearly affective (Figure 35).

Figure 33: Operator Jos posts a photo of a sinking barge on the Dordtsche Kil in 2018, with a Rijkswaterstaat patrol vessel in the background. Figure 34: Again Jos, now a tweet from 2019. A photo of a member of his crew on land, collecting remains under a bridge where a fatal collision between a person and a train took place.



Figure 35: Operator Rolph's 2016 tweet about the emergency response after a car crashed into the river.



Figure 36: Tweet from operator Mark from 2016 (top left), photo taken from the Hansweert control room. Figure 37: Sunset as seen from the Dordrecht control room (top right) shared by operator Rolph in 2016. Figure 38: Bottom left: a special transport enters the mouth of the canal in front of the Hansweert control room, as photographed and tweeted by Mark in 2018. Figure 39: In a 2016 tweet Rolph announces the departure of a large seagoing vessel (bottom right, bottom tweet) and then shows it is moving.

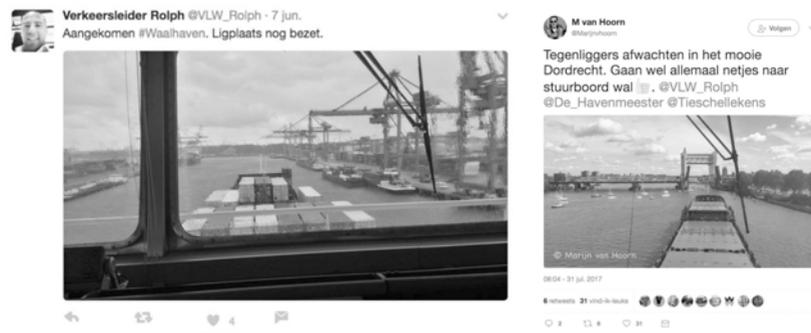


Clearly, these tweets are a continuation of the local public safety and public order concerns discussed above. Sunsets, by comparison, are completely mundane, but still provide the kind of affective content that circulates well. Mark and Rolph often relate this to the fact that they are working a late shift (Figures 36 and 37).

Large seagoing vessels are a more frequent sight for Mark than for Rolph. The rivers around Dordrecht are regularly navigated by large ships, but they need much more assistance. For Mark, it is the special transports of unusual items that stand out, such as the columns of an oil rig (Figure 38)—he expresses his admiration for the craftsmanship required for such transports. Rolph often gives updates on the progress of special transports and oversized ships through his sector (Figure 39), actively inviting his followers to see events from his perspective. He skilfully combines the spectacular with the non-spectacular, emphasising the involvement of the con-

trol room and the patrol ship and, like Mark, praising the craftsmanship of the crews and pilots. I have never observed any hostility towards the latter, either on Twitter or in the control room. Rolph tweeted about a working visit on board a container ship sailing through the port of Rotterdam (Figure 40). A local pilot on board a large vessel praised the behaviour of the recreational skippers and mentioned Rolph (Figure 41), adding that it was a good example of coordination between different authorities.

*Figure 40: Rolph aboard of a seagoing vessel in the container terminal of the port of Rotterdam, as tweeted in 2017. Figure 41: Rotterdam pilot, Marijn van Hoorn, is about to sail through the opening of the railway bridge of Dordrecht, as tweeted in 2017.*



## Expected but rarely encountered

There were three themes that I expected to find, but hardly did: criticism, time-critical information and interaction with people from outside Rijkswaterstaat. With regard to the first, especially in the early days when the conflict between operators and management was still close to the surface and the patrol vessels remained largely moored, I somehow expected to find references to this situation in the tweets. As for the second, the potential speed of distribution on Twitter through retweets (and likes) could be used to reach many actors in a relatively short period of time, which would be useful in the event of a disaster. The third theme, the ease with which Twitter allows conversations between geographically and socio-economically dispersed people, would have been a great opportunity for operators to interact while sitting behind the reinforced door of the control room.

## Criticism

If Twitter had been my only source, I would never have noticed that something was amiss between operators and management. Perhaps I was naive, perhaps I had bought into the emancipatory narrative of social media. On the other hand,

there are accounts like @lokfuehrer\_tim, a German freight train driver who has been tweeting about his travails in the rail infrastructure since 2011. The picture that emerges is one of shift work, but also of an erratic infrastructure, with considerable insight into (mis)communication with dispatchers, disruptions and delays. However, I am not aware of any such sovereign accounts by train dispatchers. And although there are quite a few barge captains active on Twitter, none share the same employer as @lokfuehrer\_tim does with Deutsche Bahn dispatchers. And although @lokfuehrer\_tim travels along the Middle Rhine right on the riverbank, the skippers he sees are more independent users of the infrastructure, often self-employed and owning their own vessel.

The near absence of tweets critical of Rijkswaterstaat, and the way this contrasts with the stories operators told me while I was in the control room, has many likely causes. Among them are: 1) the careful policing of how Rijkswaterstaat is perceived publicly, including through the monitoring of those who represent the organisation; 2) loyalty to the organisation, going back to its military roots; 3) the type of operator who is attracted to Twitter in an official capacity, and possibly the type of operator who is recruited by the communications department (both Rolph and Mark did not speak critically of Rijkswaterstaat to me during the shifts we spent together in the control room); 4) in the case of the Dordrecht control room, the successful move to the new control room, and with the harshest austerity policy behind them, there is less discontent among operators.

*Figure 42: In 2016, operator Mark retweets a tweet from Sander Wels, a retired operator.*

*Figure 43: In 2018, Mark retweets a tweet from Cees Barth, who worked on a Rijkswaterstaat patrol vessel at the time, but has since deleted his account.*



Having said that, there are two retweets of tweets by Mark that are critical and worth mentioning here. One is a tweet by Sander Wels (Figure 42), which reads “The #Waal is not a playground, but a #main-transport-axis for #shipping. Awareness of

this requires knowledge". The photo shows a jet ski and a kayak behind a push boat, the largest vessel navigating the Waal and Rhine. In the second (Figure 43), Mark retweeted something written by Cees Barth, who at the time worked for Rijkswaterstaat on a patrol vessel but, like Wels, used a private account. Barth was commenting on a news report about the shooting of beavers, which had been reintroduced in the 1980s and were now causing too much damage. Barth comments: "Quickly cleaning up the mess of a decadent hobby." Taken together, these retweeted tweets reveal a thoroughly modern understanding of rivers, as discussed in the first chapter: they should be singular entities. This understanding is juxtaposed with a practice that is messy, hybrid. The tweets in this chapter treat rivers as waterways, which makes sense, as operators focus primarily on traffic and often address other waterway users. Here, however, the modern concept of water as separate from land, which enabled the regulation of the Rhine and other major rivers, seeps through. Rivers are for transport, nature is infrastructure. The beaver, in particular, disrupts this: it lives on both land and water, blurring the boundary between the two.

### Time-critical information

In retrospect, the few time-critical tweets logically follow from professional inland navigation skippers, who are rarely addressed directly via Twitter. There is another forum for exchange that skippers are obliged to use: marine VHF radio. While Twitter allows Rijkswaterstaat to map a more dispersed control room public, the regulation of inland navigation has made skippers permanently accountable. Skippers are present on Twitter and also in operators' tweets, but mostly through likes, when they approve of the way others—recreational boaters, people living near waterways—are informed about inland navigation. At times skippers also provide content of hazardous altercations with leisure skippers.

When skippers are addressed directly, the time-critical information relates to their mobility or what is hindering it. For example, Mark reports fog conditions (Figure 44) or the current wave height during a storm (Figure 45). This information is also relevant for recreational skippers and both are explicitly addressed by mentioning the accounts @binnenvaart and @varendoejesamen. However, as will be discussed in more detail in the next chapter, inland navigation skippers have more reason to fear waves on the Western Scheldt than recreational skippers. As a rule, the yachts on the estuary are seaworthy, whereas inland waterway vessels are not built for open water, especially when they are heavily loaded.

In Rolph's case, it is noticeable that the tweets directed at professional skippers are less likely to be accompanied by pictures. This points to the urgency of the message, assuming that skippers need not be entertained by affective material, nor be introduced to an otherwise easily overlooked infrastructure as they already live this infrastructure. Although the skippers I have spent time with do not know much about the control rooms themselves.

Figure 44: Operator Mark tweets about dense fog locally, but better conditions downstream in 2016. Figure 45: Here Mark tweets what appears to be a screenshot of the wave height during a storm in 2016. Figure 46: Example of a tweet from operator Rolph (bottom right) in 2016 about a technical problem with a bridge in the port of Rotterdam, operated by Rijkswaterstaat.



As Tobias Röhl (2019) points out, the reduced capacity or even breakdown of infrastructure is often an interesting moment, as this is often communicated and in turn elicits a reaction from the public, explaining expectations and norms. Rolph writes about a crucial bridge in the Rotterdam port is “still not being operated” and that Rijkswaterstaat is doing everything in its power to solve the problem (Figure 46). Although Rolph implies that even if it does break down, users of the infrastructure might expect it to be resolved sooner, this did not elicit any complaints in response to this tweet.

## Interaction

As we have seen throughout this chapter, tweets tend to have more retweets and likes than replies. In future projects, I would like to explore this dimension further, as I have automatically tracked the Twitter activity of many accounts over the past four years. This would tell us more about the allegiances of operators through retweet networks and allow me to map how their tweets circulate. But as a preliminary remark, it can be said that infrastructure publics on Twitter and infrastructuring publics with Twitter is done through a type of narrowcasting (cf. Metzger 2017), with far more followers than those the operators follow themselves. Sometimes interaction is encouraged, but more in a planned way, like radio jockeys asking listeners to contribute. For example, when Rolph shared his sleep strategy for the

night shift (Figure 47), asking “What’s your ritual? Curious to hear!” Here, a range of shift workers, from skippers and truck drivers to fellow operators, responded with different strategies for different rhythms. The interaction between operators and their followers is reciprocal: when a question is asked, operators respond, but people do not seem to follow these accounts for controversy or witty back-and-forth. It could also be explained by the asymmetrically distributed agency in the matter of shared concern: the operator has all the relevant information needed to ensure safe traffic centralised in the control room, not his followers. The ongoing reproduction of safety and mobility by operators and skippers takes place elsewhere, as we will see in the next chapter.

*Figure 47: 2019 Tweet from operator Rolph, who is starting his second of three night shifts, having slept a few hours in advance. He asks his followers how they cope with a similar challenge.*



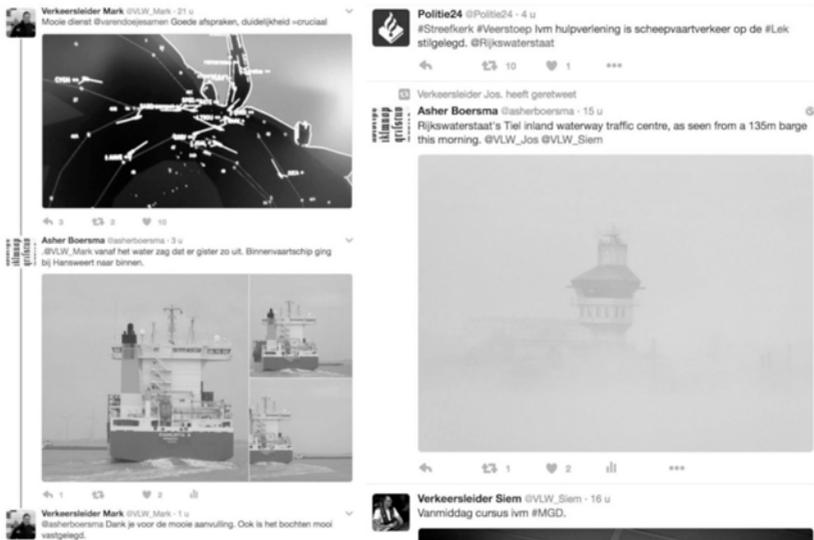
7:11 p.m. · 24 aug. 2019 · Twitter for Android

10 vind-ik-leuks

As for my own interaction with operators on Twitter (Figures 48 and 49), I was mainly trying to share what I was learning with the operators I knew. That I had other knowledge to add to the interface knowledge that I had built up through Twitter and fieldwork in the control room. As a skipper turned operator, they had advised

me to learn what it was like to navigate rivers. I was aware that by interacting with them I was becoming visible to the communications department of Rijkswaterstaat. Senior ethnographers had advised me to avoid this department, as they might want to have a say in where and when I visited the control rooms. In my dealings with other Dutch government agencies, I learned that the communications department would indeed take on an additional gatekeeper position. As mentioned in the first chapter, I also reported to my academic community and made sure that anyone interested in my work would be captivated by my fieldwork, such is the precariousness and vanity of academia. I made my work visible.

*Figure 48: An interaction between Mark and me from 2017. He writes (top left) he had a good shift with clear passing arrangements, to which I replied with three photos of what it looked like from the water. He replies that it is “a nice complementary [picture]. Also, the turning is captured well.” Figure 49: Tweet from 2016 retweeted by operator Jos, thereby appearing on the Rijkswaterstaat list.*



### 4.3. Conclusion

Operators depart significantly from the visual tradition of the control room in a number of ways. From an organisational perspective, control rooms have always been the message, never the work. Representation runs through the very existence of control rooms: from architecture to inauguration, as a backdrop for reporting, as

a set for films, through signposts integrated into the interior, exclusive but frequent tours, displayed behind large glass windows, annual publicity stunts, through large screens and dashboards that are otherwise meaningless to the operator's work, etc. They mark ambition, promise safety, confer legitimacy.

In contrast, operators differentiate the public into publics, in line with the locality of the nautical control room, as manifested from the start in local political pressure to ensure safety at places where infrastructural complexity and the acceleration of shipping grew beyond the control of otherwise rather sovereign skippers. Second, operators offer a casual route to the visual literacy needed to understand the real situation they face. This is more than just opening up an inaccessible world. Thirdly, by addressing multiple audiences—often at the same time, as when recreational skippers are told how (not to) navigate busy rivers—it also shows that professional skippers are making efforts to counter the erratic behaviour that causes them stress. At the same time, people living along the waterways are reassured that Rijkswaterstaat operators are keeping an eye on things. Together, this allows the operators to avoid the insider-outsider conflict that characterises most infrastructure work. Fourth, through the persistent presentation of the near misses as dangerous, but as non-events nonetheless, they have found a way to legitimise control room work, not just control rooms, despite its success.

Nevertheless, operators remain visually oriented in their representations. In this sense, the operators' representation of the control room on Twitter is a gradual change, building on a representational tradition rather than breaking with it. At times, however, operators were engaged in a form of symbolic legitimacy that differed only in scale (local) in correspondence with the control room territory and Twitter affordance. Ironically, the thing it echoed, NORAD tracks Santa, was long acoustic at heart: children could call in to hear where Santa was, and the image used in the chapter is merely the sleeve of a record containing radio reports of Santa's whereabouts. It is also ironic that the otherwise dominant audio dimension of inland navigation control room work remained opaque.

The use of Twitter by control room operators should be understood, as I have shown, as a new and important marker on the continuum of which control room work and control room representation are part. In this and the previous chapter I have shown not only that the control room as a space has a dual function, but that the work itself serves both purposes, increasingly so.

This chapter has shown the direction in which control room work might move if the management's distribution strategy continues: rather than just making control room work visible, operators have begun to engage in visibility work. For the crews of patrol vessels, this trend is even stronger. If we look at the dynamics between different parts of the Rijkswaterstaat organisation, we can see the contours of a reshuffling: the rise of the operators pushed the river masters and their crew first into a centrally directed position and then into a representative role for Rijkswaterstaat as

network managers eager to connect with the public; the operators moved when their information position was no longer exclusive; as a result, it looks like those who used to be the public relations officers or spokespersons are now monitoring others who do this work for them.

Andrew Abbott (1981) has written about how income is generally correlated with intra-professional status: the higher the status, the higher the income. This is a paradox because the jobs most admired by the public have low intra-professional status, and vice versa. Abbott argues that “the highest status professionals are those who deal with issues predigested and predefined by a number of colleagues.” (823) By contrast, “the lowest status professionals are those who deal with problems from which the human complexities are not or cannot be removed.” (834) For Rijkswaterstaat, in a play on Abbott, it could be said that those who enjoy high public status have low status within the organisation, and vice versa. The operator has something to show for it, intervenes in a physical reality to achieve movement that is crucial to the lives of those living on and around the water and to the Dutch economy in general, whereas the people who work in the Corporate Service have less to show for it. Their workplace is not famous, but their position in the organisation is more secure, their work is less muddy and their pay is probably better.

