

Chapter 3 – Control room Prestige and Design intertwined

Control rooms as circulating images and as architecture are complementary. De Vaujany and Vaast write that “organizational legitimation” is often visual, and that “then (...) both image-object and image-screen iconographies” are required (2016: 765). By image-object, they mean a “material sign” that needs to be experienced in a given context to “fully convey its intended meaning” (768), such as a control room in a river landscape. Image-screen iconographies, on the other hand, are “meant to be distributed, reproduced, transformed and commented upon” (ibid.), like the long visual tradition of the control room, and not unlike the circulated tweets discussed in the next chapter.

There are three main sections to this chapter. First, the tradition of making control rooms visible for organisational purposes, including how the interior is shaped by this desire. The focus is on infrastructural control rooms, and gradually the control rooms of Rijkswaterstaat are zoomed in on. Then, in section 3.2, I take a closer look at the two main academic discourses on control rooms for this study and their obvious and less obvious links to the visual tradition of the control room. The final section uses the practices of gatekeeping as a lens to focus on the shifting interplay between prestige, working practices and organisational dynamics.

3.1. Traditions of making the control room (work) visible

To whatever extent the control room has been made visible, it has never been done by the operators themselves. Control rooms have been mobilised for state legitimacy (Figures 1, 2 and 3), to demonstrate military power and reach (Figure 4), to discipline and reassure by displaying urban surveillance (Figure 5), as a geopolitical marketing tool (Figure 6), to boast about corporate management (Figures 7 and 8), as a “topos” (Huhtamo 1997) in imagined techno-futures (Figure 9), to depict dystopia (Figure 10), as an automated liability in a networked world and a vehicle for teenage deviance (Figure 11), as a backdrop to lend authority to whatever is said (Figure 12), as evidence

of the state's ability to monitor and regulate mobility (Figure 13¹). What all these examples have in common is that it never really matters what the operators are doing there, but that these places exist as such—the medium is the message. Concretely for the Dordrecht control room, what is remarkable, is that initially the managers got to present it in the local press. The first exception I found was an article in an inland navigation magazine—a completely different audience—in which Dirk Zwi-jnenburg and Ad van Zanten explained in detail what the operators were trying to do.

In the control room of Prorail (the Dutch state agency responsible for rail infrastructure) in Rotterdam—which I was allowed to visit for two hours after persistent lobbying by contacts in the organisation—I saw that most of the consoles had a sign on the back indicating what was being controlled (type of train or region). There were also two large screens on a wall, which no one seemed to be interested in, showing a live map of the Netherlands with all current and resolved train disruptions (Figure 14). Many of the dispatchers did not have a clear view of the screens or were too far away; they were behind walls of screens with very different representations of smaller sections of the network (Figure 15): Latour and Hermant's "small wholes" (2006).

1 Van Rees was once a traffic policeman in a Porsche convertible, then got a desk job in the Driebergen motorway traffic control room, from where he read out the traffic information on national radio (a task long performed by the Dutch police, but more recently taken over by Rijkswaterstaat). Requests for television interviews grew as congestion increased, so he converted a corner of the Driebergen control room into a makeshift television studio, with his colleagues working in the background (Hout 2008). In 1997, shortly before his retirement, Van Rees appeared as himself in *CRISIS* (Emans 1997), in which famous politicians dealt with a simulated crisis, ranging from major environmental disasters and nuclear accidents to terrorist attacks -Rijkswaterstaat was given a prominent role in several scenario's. This hour long show ran from 1997 till 2002 on Dutch public television. I was in contact with Van Rees, but he suffered a stroke before we could meet and passed away in 2019. The show always ended with an expert called Uri Rosenthal—who with his team had also designed the fictional crisis scenario—reflecting afterwards on how the politicians had performed. He judged performances for a large part on communication with those sections of the public affected by the crisis. In addition to his academic position, he founded a crisis management company, and trained many politicians from the conservative party (VVD). Rosenthal later became a prominent politician in his own right, reaching the position of foreign minister, despite having no experience or training in this field. Most of his cabinet colleagues had once done a training at his company or were his former employees. This vision of politics as crisis management echos the Rijkswaterstaat management practice, as discussed in chapter two. Expertise lies in crisis or reorganisation, regardless of the context.

Figure 1: Photograph of the inauguration of the Hoek van Holland control room by Prince Bernhard in 1956, now hanging in the corridor of the same control room, which is part of the Rotterdam control room network. Figure 2: Photo collage accompanying an interview with Rijkswaterstaat motorway control room operator Petra Lubbers, a former naval signal operator, published in 1998 to commemorate the 200th anniversary of Rijkswaterstaat. In the interview Lubbers describes her job as “Big Brother is watching you, but your heart is in the right place.” (Bendeler et al 1998, 102) Figure 3: Photo of Dutch King Willem-Alexander of the Netherlands (standing left) and Minister of Infrastructure and Environment Schultz van Haegen (far right) visiting Traffic Center Helmond 2015.



Figure 4: Drawing of a Luftwaffe operations room which appeared in *Signal*, a Nazi propaganda magazine published in several languages throughout Europe in occupied countries. This is the Dutch version of an issue from 1944.



Figure 5: 2016 photo of an underground control room in Shanghai, visible to the public through a window, with text in (both Mandarin and) English: "Station Control Room". For several years there was a similar control room at Berlin's Alexanderplatz underground station, where you could speak directly to the BVG operator through a circular window. Sometime in 2019, an updated version of the control room was closed.



Figure 6: Four stills from Gazprom's 2013 commercial, aired at the start of every Champions League match, the world's most lucrative and popular club football tournament. It shows the natural gas pipeline network and zooms in on the control room of which it is a part. It then shows the ephemeral energy flowing from the taiga to the football pitch, which is being watched on television. The last image is the final frame of the commercial. Gazprom is a state company with a revolving door to the Kremlin. The Russian invasion of Ukraine and the sabotage of the Nord Stream pipelines in 2022 have since made such advertising unthinkable.



Figure 7: Two photos of the Du Pont Chart Room, the first from 1919, the one below from 1950. The second appears in Yates' *Control Through Communication* (1989) and was "a direct answer to this problem of information overload." (266) It was made public when the company "hosted a series of presentations about the chart room, the techniques it employed and 'management by ROI' [return on investment] at a financial conference hosted by the American Management Association" (Castellano 2015).



Figure 8: First an artist's impression of the SAP Boardroom from 2016, and then a screenshot from a 2020 promotional video by SAP on the German football club TSG Hoffenheim, owned by the founder of SAP. Here, the table has touch screens built into it. The text on the wall to the right reads "the future is now."



Figure 10: Still from *thx1138* (Lucas 1971a), shot in Bay Area Rapid Transit control room in 1971. In the short film made to promote it (Lucas 1971b) Lucas says “if you were to make a film about the future, the way to do [it], would be to use real things, because we are living in the future.” As a result, *thx1138* used only existing locations: industrial and infrastructural control rooms in and around San Francisco. The movie’s tagline was “the future is here”.



These elements could, of course, also anticipate representation. A large screen (Figure 16) was set up in the WSV (Wasser- und Schifffahrtsverwaltung des Bundes) district centre in Duisburg, on the banks of the Rhine:

When I asked what was wrong with the big screen in the left corner, which was switched off, Bert said: “It broke down because it was just standing there, not being used”. “Curious,” his colleague Joachim interjects. The screen was supposed to monitor a certain section in case of a “havarie”; they could also run the MIB (“Melde- u. Informationssystem Binnenschifffahrt”) on it. But the thing was too warm and made too much noise; the colleague sitting all the way to the left would be really bothered by it, so they switched it off. It also runs on XP, and they now have Windows 7 on their consoles. It would have cost between 30,000 and 40,000 euros to update it and they felt it was a waste of money. (Field note, 19.4.17)

On my way out, I picked up a flyer at the entrance with the big screen on the cover (Figure 17). There, it was not broken yet, and showed an image of a ship on the Rhine, which could suggest it is a live CCTV feed, given how most inland navigation control rooms work or are depicted, while it must have been just a photo. The slogan of the WSV is “wir machen Schifffahrt möglich”, as the leaflet shows. But the operators do not use their direct view of the Rhine. They maintain a database of who is on the river with what cargo by communicating via marine VHF radio. In fact, they keep the blinds closed for ergonomic reasons.

Figure 11: Poster for the movie *wargames* (1983), in which a teenager hacks the North American Aerospace Defense Command (NORAD) control room, depicted in the top half. The movie addresses anxieties about automation, artificial intelligence and the virtual, while implying that with the advent of personal computing this is no longer such an exclusive domain. Over the years there have been tours for civilians, when it was located in the Cheyenne Mountain (1956–2008) and when it moved to the nearby Peterson Airbase, also in Colorado.



Figure 12: Screenshot of an interview with the head of the Royal Netherlands Meteorological Institute (KNMI) aired by the NOS, a Dutch public broadcaster, at prime time. The item was about climate change causing extreme weather, which brings climate science and meteorology together in a complicated way: a thirty-year average and a short-term prediction. In the Netherlands, with its long coastline, storms are a common phenomenon, and weather warnings are often given in different colour codes. The item said the KNMI has now issued a code orange for our climate. In such coding systems green is safe and the closer to red is dangerous. In the many popular representations of war rooms similar coding schemes are used, in WARGAMES to indicate nuclear alert. Since the 2000s several countries have implemented coding schemes to indicate the likelihood of a terror attack. What these examples have in common is an implied centre from which this is issued, a place with a superior information position and the authority to judge.



Thus, only when the aim is to represent the work, to show what it is that the organisation makes possible, a photo displayed on the otherwise dysfunctional large screen makes sense.

Beyond the inauguration or a working visit by a dignitary, which are always staged to a degree, infrastructure is invisible. Some of the key properties of infrastructure are that 1) that infrastructure is embedded, it “is sunk into and inside of other structures, social arrangements and technologies,” 2) that it is “transparent to use, in the sense that it does not have to be reinvented each time or assembled for each task, but invisibly supports those tasks,” and 3) that the “normally invisible quality of working infrastructure becomes visible when it breaks” (Star 1999: 381–2). It may even be inherent to service work: “that the better the work is done, the less visible it is to those who benefit from it”. (Suchman 1995: 58) It seems that the Dordrecht control room became much more visible because of its faltering operation,

because that is how I noticed it. In general, it is the norm to emphasise publicly how much the state is in control, which in the case of the Dordrecht control room is mainly done locally.

In her article “Making work visible”, Lucy Suchman (1995), who has written extensively on air traffic control, explored the tension between the representation of work by workers or by the larger organisation. To begin with, she wrote: “[t]o a large extent, representing work is the stuff of which organizations are made.” If we briefly return to the KNMI Weather Room: for a different research project Simon Hirsbrunner and I interviewed all people involved in making a news item for prime-time television that featured the Weather Room (Figure 12). However, the head of the KNMI said that the Weather Room had nothing to do with the item itself, but that journalists and viewers “are not interested in a boring office” (Interview 15.7.16). It is thus more difficult to represent work, at least symbolically, when the workplace is generic.

Figure 13: Still from the 1997 Dutch television show CRISIS, in which the famous highway traffic control room spokesperson Rob van Rees played himself, see footnote 8.



Figure 14: The screen at the Rotterdam rail dispatch centre (“Verkeersleidingpost”), which none of the operators can read, photographed in 2017. Figure 15: The live positions of trains for the purpose coordination purposes are displayed in abstract linear diagrams. Figure 16: The Duisburg WSV Revierzentrale in 2017, with the large screen switched off at the back, left, and the venetian blinds closed on the right. Figure 17: Scan of the leaflet of the Revierzentrale with the screen turned on at the back.



Wir machen Schifffahrt möglich.



Revierzentrale Duisburg

Sicherheit auf dem Rhein und den Westdeutschen Kanälen



The representational tradition of Rijkswaterstaat

This also applies to Rijkswaterstaat’s managers and policy advisors. After the switch to ‘network management’, the control rooms became an important place to represent, where in the past ingenious sluices, improbably long dams or aqueducts could be used to represent Rijkswaterstaat’s work. Although the Dordrecht control room is open to a limited number of visitors once a year (as part of the National Day of Inland Navigation, which will be discussed in the last section of this chapter). Representation is a way of reaching a wider audience. Basically, “[r]epresentation is creating

an image asserted to stand in place of or speak for another; an imaging developed through engagement with the other but then taken off, to some distant site.” (Suchman 1995) This is why Rijkswaterstaat has photographed its control rooms over the years; material that is freely available.

Figure 18: The Tiel control room photographed during the 1998 high water. The caption Rijkswaterstaat has given it says: “A traffic post [verkeerspost] is a location of the Dutch Vessel Traffic Service, which coordinates and steers traffic on the Dutch waterways. In addition, the traffic posts keep an eye out for unusual circumstances, breakdown, accidents and environmental damage. The traffic controllers [verkeersleiders] of Rijkswaterstaat, also called VTS-operators, give skippers information about traffic and the local conditions of waterways via marine VHF radio.” Figure 19: Operator in the Schellingwoude control room, photographed in 2014. Figure 20: This photo has no other caption than “computer images” and was taken in 1988. It shows the database operators monitoring of the movement of ships of exceptional size or with dangerous cargo, separating upstream and downstream.



The photographic material of inland navigation control rooms in Rijkswaterstaat’s image archive, which is fully digitised and available online, can be divided into roughly three categories: 1) the control room as part of the (infrastructural) landscape, 2) the interior of the control room with one or more operators behind a console, and 3) close-ups of interfaces. Most of the material falls into the first and second categories, the third being an exception. In the case of the control room in the landscape, there are also a number of photographs taken during periods of high water (Figure 18), with the control room as a solid presence in a liquid world. The most typical photographic representation of Rijkswaterstaat’s infrastructural control rooms is an operator at work in a static, slightly posed position (Figure 19). Of the third category, I only found photographs from the 1980s and 1990s (Figure 20), of which I have no idea if they were circulated and how often.

My reading of these images is rooted in both my observations in the field and my own attempts to photograph control rooms and operator work, and to capture their interfaces. I photographed these with two purposes in mind. One was to study the

images afterwards, when I had time to stare at them without disturbing an operator, and both to make sense of what was happening—although, especially in the beginning, events often simply unfolded faster than I could comprehend them—and to study the interfaces, trying to understand what was being mediated and what use the software was allowing. The other purpose was to represent my field to my peers, as I have done in my presentations at my institute's colloquium, at workshops and conferences, in articles, and now here.

In retrospect, I appreciate more and more how these efforts actively position me in the (sometimes) diverging interests in the representation policy between operators and Rijkswaterstaat. Unlike writing notes, taking photographs was not a task I could hide behind. Having once taught a course on the history of (art) photography, I'm sensitive to the specifics of the medium and the ethics of how taking someone's photograph can be a possessive act (cf. Sontag 1977). It often took me some time to feel confident enough to take the camera out, and I asked permission from each person I photographed. They knew the purpose of my presence and my interest in photographing them. Although no one refused to be photographed, some were clearly more comfortable than others. Some thought they should get out of the way, that my interest was primarily in their setup, others questioned my mode of photography or set boundaries. A small episode in the Nijmegen control room at the beginning of my fieldwork stands out in this respect:

When I asked if it was OK for me to take photographs, operator Sander said it was fine, as long as I didn't take a quick picture while he was using the binoculars. He says that media professionals that visit the control room always want that you grab the binoculars, although they hardly use them anymore. (Field note 6.12.16)

No one else ever mentioned this. One could read it as going against the demand of many operators to have a direct view on the water, but I mainly understand it as a complaint about having to enact someone else's idea of an operator, about being represented on someone else's terms. As a result, I have never photographed an operator using binoculars, although it has happened often enough.

There are very few moving images in the Rijkswaterstaat image archive that might show operators at work. The only thing I found was some raw footage shot in the Dordrecht control room in 1996, which includes some close-ups of interfaces and some audible fragments of radio. One of the operators I recognise from his voice as Fokko Boersma, whom I met more than twenty years later (see chapter two). At first it seems that he is working in the Heerjansdam sector, which includes the Oude Maas—Dordtsche Kil junction. But then a voice from behind the camera says: "The push boat has called you now". Fokko is wearing a headset, so this part does not need to be acted. A few seconds later, he breaks the fourth wall, looks twice into the camera (Figure 21) and says "just give me a signal when I can talk". The voice

behind the camera says “OK” and Fokko continues pretending to call a ship. Later, another operator is instructed to look through binoculars. This last instance has a more alienating quality, whereas the simulation of marine VHF radio interaction is a key component of simulator training, where oldtimers then play skippers and newcomers play operators.

Figure 21: Still from raw footage retrieved from the Rijkswaterstaat image archive. Fokko Boersma looking the camera in 1996.



It is the deviation from the norm that shows what the norm is in the first place: in the representations, the operators never acknowledge that they know they are being recorded. It is shown that they are working, not much more than that. Unless they are broadcasters like Rob van Rees (Figure 13), but then they are not really working at the console. As for the close-ups of the interfaces: I have managed to make some sense of the close-up shown here (Figure 20), but would need an operator to work with it to understand it properly. Two things stand out here: the operator needed to explain the representation as a rule does not travel with it and secondly, the representation of only an interface is utterly unspectacular, so probably would not travel far in the first place.

Same control room photo, different readings

In addition to its own material, Rijkswaterstaat has allowed outside media professionals to photograph its control rooms, knowing that this material will also travel and represent Rijkswaterstaat. One such image—part of the collection of one of the major Dutch journalistic photo agencies (called *Hollandse Hoogte*)—is interesting

for its formal qualities, but above all for the different places where it has appeared. It was taken in the Nijmegen control room and shows an operator at the front console, the one with the clearest view of the intersection of the Waal, the main Dutch continuation of the Rhine, and the Maas-Waalkanaal, a canal that connects the Waal to the Maas. This is the control room discussed in the previous chapter, the one that had to stand out in the landscape.

Figure 22: A photo by Ton Poortvliet of an operator in the control room in Nijmegen. On the right, a smaller yellow ship passes by, which is a Rijkswaterstaat patrol vessel. Figure 23: The same photo is used on the website of the transport magazine Totaaltrans to accompany an article about the conflict between operators and management and the political consequences. Figure 24: Again the same photo used on a Rijkswaterstaat website for BICS.



Both the timing and the control of the depth of field show that this is a professional photograph. It takes a lot of patience to get so many ships at the intersection, and the inclusion of the patrol ship passing by is so perfect that it could have been staged. If the raw footage taken in Dordrecht is anything to go by, staging cannot be ruled out. It also takes a skilled photographer to stretch the depth of field to such an extent. The operator, the interfaces and the ships are all in focus, which is more difficult because of the different light intensities. That might have required some

post-production. With an inferior camera and inferior skills, I also tried to make this photo, but never succeeded.

Such a picture would have been useful to illustrate how many players are involved in traffic coordination, although not all are visible here. The dark screen on the left is the cargo database, IVS or its successor IVS Next. On the skipper's side, the complementary system is called BICS (Binnenvaart Informatie- en Communicatie Systeem), through which cargo and voyage details can be registered. The Rijkswaterstaat website for this system contains instructions for skippers and specifications for developers. There is a browser-based version of BICS and a standalone application that works offline without being dependent on other software. The latter can be downloaded from the website. The homepage of the website uses the photo of the Nijmegen control room. The website is available in several languages; the German caption for the photo is “Die Waal bei Nimwegen, gesehen von der Verkehrsleitzentrale aus”. The text is hyperlinked to the location of the control centre on Google Maps. When entering the Netherlands via the Rhine at Lobith, the Millingen sector operator, who is based in the Nijmegen control room, is the first representative of the state a skipper will meet. Prior to departure, a vessel with potentially dangerous cargo or of oversized dimensions must register via BICS. Jerry, the skipper of the container ship *Sunrise*, showed me the procedure before we left the Duisburg container terminal (Field note 29.3.17). The software that distributes the containers on the ship (Figure 25) exports the relevant data to the BICS software. Jerry added the data of the ship, journey, persons on board and the signage the cargo required (Figure 26). Due to the tank containers with chemicals—which require a minimal distance between them, complicating the distribution of weight—the *Sunrise* had to carry two blue cones (Figure 27). Upon entering sector Millingen, the transfer of this data between the Revierzentrale Duisburg, which covers the river until the German border town of Emmerich, is checked as the skipper calls in.

On board the *Liberty*, this automatic transfer had not taken place:

“Post Millingen, the Liberty going down stream,” Millingen answers with a mere “Post” and the operator says we aren't registered and asks for the registration number of the ship. (...) Rob gives the number routinely, the Post asks what our draught is, 2.6 Rob says. I asked who should have told him who we were. Rob says: “Germany, the Rivierzentrale, the operator will request the info there.” (Field note 29.11.16)

Here the exchange of databases disappears behind the various operators Rob was talking to on the marine VHF radio. Rob seemed to think that the operators in the Dutch and German control rooms were in personal contact for each transfer, and the way I asked the question suggests that I was assuming something similar. We could think this because our cargo was grain, which does not require registration through

BICS. However, the international exchange of its data is automated, building on the tradition of transnational governance of the Rhine that dates back to the 19th century (see chapter one).

Figure 25: Using software called ContainerPlanner, Jerry organises the distribution of the containers (including future unloading). Figure 26: The data is exported to BICS via a form in which Jerry also enters the details of the voyage, draft, height, number of blue cones and people on board. In this and the previous figure, the true name of the ship is hidden. Figure 27: The blue cones are two steel objects placed at the stern to signal the dangerous cargo to other skippers.



In the past, skippers used to report to the control room in Millingen, where the Rhine splits into the Waal and the Pannerdensch Kanaal, which connects to destinations further north. The direct view of this stretch of water was abandoned and several sectors were centralised in the new control room in Nijmegen. The old control room is still there—it is now used as a residence for artists. Generally, I noticed while on board of several ships that not all skippers had managed to keep track of the Rijkswaterstaat centralisation efforts and did not always know where the operator they were talking to over the frequency was located.

The placement of the photo of the Nijmegen control room on the BICS website, and the way in which it was done, locates the apparently placeless database. Although, of course, databases are located somewhere. Bert, the Duisburg operator, proudly showed me the server room, as skippers would show the engine room (Field note 19.4.17). However, it is precisely the screens that display the relevant interfaces that were not captured by the photographer. The choice of this photograph as a representation, and the way in which it is framed on the BICS website, therefore seems to be less about making the system transparent and more about representing a localised authority. It shows the skippers as the embodiment of that authority, the one who oversees them.

Another place where the same photo was used was in a report on the 2015 conflict between operators and Rijkswaterstaat on the website of a transport magazine (Figure 23). The headline translates as ‘Minister denies unsafe waterways due to understaffing’ and is about a response by the responsible minister to questions

pretty sure it contains notes he takes while coordinating traffic, and probably looks something like Figure 28: Operators often keep track of the names of vessels and the directions in which they are heading, in order to be able to pass on this information quickly when a particular passage needs to be planned and arranged through concise communication. Remember that the marine VHF radio frequency is shared by all vessels in the sector and only allows one participant to speak at a time. The more people who share this acoustic space, the less room there is for each individual voice. In Nijmegen, for example, when a ship comes out of the locks of the Maas-Waalkanaal and calls in, it is offered an overview of the traffic, with the distances from the approaching ship to the crossing given in metres. The difficulty often lies in the names of the ships and their intentions. The interface provides the former, as the AIS data is labelled to match the display of the radar image on the chart, but not the latter. So the operators write down the names and add little arrows to refer to when providing an overview and suggesting passages, which can easily include five different vessels. The notes are kept in a drawer for a short time after each shift, in case they need to reconstruct a particular event and see if the operator has noticed all the relevant ships. As far as I know, this was done voluntarily. Such paper practices, quirky perhaps for work coupled so tightly to media technology, have long persisted in air traffic control too (cf. Potthast 2008). Again, all this is only visible to the initiated; I was only able to represent this practice because I had experience and other material to draw on.

3.2. Combining workplace studies and media studies to avoid their pitfalls

So far, we have moved from the larger tradition of infrastructure- and mobility-oriented control room representation to the inland navigation control rooms of Rijkswaterstaat. In this way, I have tried to illustrate how organisational legitimacy and authority are conveyed through control room representation, which usually obscures the operator's work itself. It was only through my knowledge of the work and my experience of representing the control room myself that the obfuscation could be given a more concrete dimension. This also allowed me to identify control room elements—in addition to the architecture discussed in the previous chapter—that are made for representation, not for the work itself: be it the large screen in the WSV Duisburg control room, the signposting in the KNMI weather room or the dashboard in the Prorail train dispatching centre in Rotterdam. The different readings of the same photograph are rooted in the different audiences that control rooms (are) designed to address. In previous chapters I have spoken of audiences, plural, not singular. Skippers are not usually addressed by the dominant regimes of representation. The only symbolic dimension they encounter is the architecture of control

rooms, otherwise they are confronted with operators directly, via marine VHF radio, or through regulatory protocols materialised in software interfaces.

This brings us to the literature on the visibility of control rooms. From a media perspective, there are two key texts, neither of which has the ambition to connect lived experience, organisational dynamics and representational regimes. They do not differentiate control room publics because they do not consider in detail who is being addressed. The omission of control room practice and the kaleidoscopic approach to control rooms to some extent reproduces some of the aims of representational regimes: to discuss that they are there, not what they do. The virtue of the kaleidoscopic approach is that it brings into view the many different manifestations of control rooms that permeate our society. Shannon Mattern (2015) takes an interface perspective, tracing the evolution of dashboards from hardware to software. These are important roots as they also bring the haptic dimension into view (cf. Plotnick 2017). She critically traces the trend to govern cities through data, represented in dashboards, also publicly through websites with real-time ambitions. Cormac Deane (2015) takes a more explicit media archaeological approach to the control room, focusing on military manifestations but also attempting to periodise ambitions and technological developments from 1939 to the present. What both authors show is that there is clearly a control room continuum between popular culture, imaginaries of technological control, political ambitions and “technological solutionism” (Morozov 2013).

I too have tried to show this in the opening pages of this chapter, albeit in a somewhat narrower way. However, I argue that more mundane, less famous representations—in local newspapers, through inaugurations, as a backdrop for broadcasting traffic information—tell us a great deal about control rooms in their local entanglements. I have tried to highlight some of the stories not covered by the representational accounts offered by Shannon and Deane. In the first chapter I have traced how an infrastructural need for centralised and mediated control emerged and where it manifested itself locally, a perspective enriched in the second chapter as a labour history. What is missing in Shannon and Deane, as in the otherwise rich studies of military control through technology (cf. De Landa 1991; Edwards 1996) and its later materialisation in drone warfare (cf. Gregory 2012; Väliaho 2014), is a bottom-up view of the actual work. The main exceptions come from Mainz, where Gabriele Schabacher’s *Infrastruktur-Arbeit* (2022), her work with Sophie Spallinger (2023) and Tom Ullrich’s work (2024) embody a new direction in media-infrastructure research.

The actual control room work has been captured aptly by a discourse on what Lucy Suchman has called “centers of coordination” (1997). In the 1990s there was a real coherence to these studies, captured by the emergence of workplace studies, but since then they have spread to other disciplines such as sociology and geography. What they all have in common is that they are rooted in sustained observation of practices and are reported ethnographically. Together, these studies pro-

vide valuable insights into human-computer interaction and cooperative work, the materialisation of the networked society, and the organisation of mobility. Scholars have looked at the practices of organising air traffic safely and efficiently (cf. Harper and Hughes 1992; Harper et al. 1997; Sanne 1999; Potthast 2007), airport logistics (cf. Suchman 1993, 1997; Potthast 2011), the metro (cf. Heath and Luff 1992; Filippi and Theureau 1993; Heath and Luff 2004), emergency dispatching (cf. Whalen and Zimmerman 1990), energy distribution (cf. Silvast and Virtanen 2014) and maritime navigation (cf. Hutchins 1995). In retrospect, they could be said to have examined the practical manifestations of the larger “promise of control” (Anderson and Gordon 2017). These studies included representations of the control room, which were used to explain in detail how operators worked. Therefore, we now know how control room work consists of mutual orientation—unearthing informal tactics like whistling to notify a fellow operator which task you are performing—and different forms of intense cooperation resulting in the “ongoing” (cf. Suchman 1997; Heath and Luff 2004) accomplishment of safety and mobility. This is much more than the execution of a schedule: often the updated schedule is more a representation of the work done (cf. Suchman 1995: 59) than of the work at hand. These studies were also visual in another aspect of their method, as it was propagated to the work of film operators in order to reconstruct the small steps taken to complete a task. In this way, scholars produced their own regime of representation, largely unaware of the political tradition of making the control room visible that media scholars have brought to light, and of the organisational dynamics of which these representations are also a part. Unwittingly, surely, by deeming it worthy of such prolonged study, these workplace studies contributed to the prestige of the control room.

3.3. Control room gatekeepers caught between prestige, concentration and resignation

As described above, the mediated presence of control rooms is an important reason why they are so widely known. However, the media professionals who produce these representations are only one of many visitors, perhaps the least frequent. For the remainder of this chapter, it is worth focusing on the gatekeeping practices of control room operators. The control room is moving away from the inaccessible place it once was: increasingly, control rooms have long been designed to welcome outsiders. To understand who is welcome, how they are let in, and how their presence is managed is to understand control rooms as double functioned. In this respect the second half of the chapter is indebted to work done by Regina Peldszus (2021), who has labelled this “dual use” in the context of space mission control centres.

I extend Peldszus’s argument in two ways: First I pose that control rooms in a wide range of fields (large scale infrastructure, urban management and policing,

nature monitoring, space flight) combine the material organisation of complex procedures with contributing to the “overarching programmatic values of their operating organizations as establishments of international prestige, sophistication and capability.” (Peldszus 2021: 285) Second, as also shown above, for nautical control rooms legitimacy and accountability are equally important programmatic values to pursue.

As detailed in chapter one, large infrastructural interventions such as dams have long been the primary instruments of legitimacy of the modern state, made visible through inauguration rituals, visitor centres and their sheer scale. In the older generation of control rooms studied here, the actual gatekeeping is still done by operators, and time and space for visitors are limited. In the newer control rooms, gatekeeping in its practical sense is largely taken away from the operators, while more space is made available for visitors. Through a series of ethnographic descriptions of control room visits and their set-up, I show how gatekeeping is done. The final case discussed is exceptional and contrasts with the previous ones: it shows what happens when a control room is no longer integrated into and aligned with state programmes of legitimacy and prestige. It has fewer resources to keep the gates open and takes the task less seriously, which has a detrimental effect on what I call the everyday ‘concentration regime’ maintained for coordination work.

Gatekeeping is increasingly about opening gates deliberately and frequently, rather than keeping them closed. Furthermore, I argue that gatekeeping in control rooms takes place in a threefold cycle: 1) someone has to grant you access, 2) someone has to open the door, 3) your presence has to be acknowledged and accepted. This approach also allows for the integration of the classic literature on gatekeeping (cf. Whyte [1943] 1993), in which gatekeeping is a metaphor, with actual sociomaterial practices of gatekeeping, i.e. physical boundaries that are designed to be technologically open and closed.

The three phases of gatekeeping

Of the three phases, the first and second are usually not performed by the same person. The first phase of gatekeeping is about permission, and the second is about actually opening the gates. The third phase is about social acceptance: people opening up, sharing their thoughts, past experiences, explaining what they are doing and why. This article focuses primarily on the phase in between, and how it reflects the organisational dynamics that govern the first phase and the issues of trust that govern the third.

One of the difficulties I encountered in my fieldwork was how legitimacy operated in different ways. What legitimised my presence in the control room for middle management made the control room operators suspicious. Organisationally, a basic interest in control room work confirmed the prestige so assiduously constructed

in the local and national press. Conversely, the operators were suspicious of anyone who aligned themselves with middle management and wanted to reproduce the narrative of high technological competence (see chapter two).

As mentioned in chapter one, the way in which Rijkswaterstaat's control rooms came to my attention was through a prime-time news programme on Dutch national television in 2015. In it, the operators stated that they were no longer in control. They were understaffed and, as a result, unqualified temporary staff were being placed behind the console. It was unusual for the operators to break rank. Rijkswaterstaat is a prestigious, originally military organisation. So in the early stages of my fieldwork in 2015, the management didn't want anything that went against their programmatic values to be reported. They treated me more like a journalist who wanted to uncover something quickly, unaware of the slow pace of academic publishing, whereas operators wanted to share their concerns with me and generally wanted a view from below, from the workplace, to be visible.

This shows 1) how the dual function of control rooms is interlinked, and 2) how it becomes visible in misaligned phases of gatekeeping. First, if the co-ordination work of the operators does not run smoothly, it cannot demonstrate capability and accountability, and thus provide legitimacy and prestige. Second, even if management chooses to give the command to open the gate (phase 1) and the operators comply (phase 2) mostly like none of them will open up to the visitor. Alternately, once I have been let in the control room without permission by management to encounter very frank operators. Yet I decided against the offer to let me in regularly without managements' knowledge or consent as I deemed endangering operators' job security unethical.

Not all ethnographic fieldwork takes place in places that are so clearly walled or enclosed, and so these three phases only apply to the study of organisations with clear spatial security regimes. In his classic study *Street Corner Society* ([1943] 1993), Whyte devotes an appendix to his relationship to the field, a Boston neighbourhood he called 'Cornerville', and to access in particular. "Cornerville was right in front of me and yet so far away," Whyte wrote (289). The control rooms I studied were not right in front of me, they were physically far away, on isolated patches of land near the intersections of major waterways whose traffic they coordinated. After a long struggle, Whyte finds a man called Doc who agrees to show him Cornerville (cf. 290–1). As explained above, one such person does not exist for my field, as it lacks the spatial and cultural unity of Cornerville. In particular, by focusing on the second phase, the operators who man the gate, gatekeeping is neither a metaphor nor a metonym. In the first stage it is a metaphor, where the permission of middle management ultimately opens the gate. In Whyte's case, Doc's vetting process is part of a classic metaphorical gatekeeping practice. It still requires Whyte as a stranger to declare his business, but there is no actual gate to open. After that, Doc is more a

guide than a gatekeeper: he shows Whyte places he did not know, introduces him to people he does not know. Thus gatekeeping moves from metaphor to metonym.

The story of gatekeeping at the control room door can be told in four episodes. The first is only briefly touched on here, it was when the political advisor and former control room manager Pete took me to the control room in Dordrecht for the first time and covers the basics. On a later chance visit during a night shift, I learnt that the control room operators also remotely controlled the main entrance when the receptionist left. In most of the Dutch control rooms I studied ethnographically, gatekeeping is done by an operator in 'recovery mode'. Only during night shifts, when there is less traffic, less staff and very few visitors, is radar duty and gatekeeping combined.

The second episode looks at the purpose of the control room door and how this has changed, leading to the third episode, which looks at the recent trend to explicitly design a control room for visitors, as in Maasbracht, described at the end of the previous chapter. In a fourth and final episode, I discuss the curious case of the neglected control room door.

Who gets in

Apart from that first visit to Pete, the operators always knew I was coming. The exact time was flexible, as long as I didn't come at shift change, when the operators are too busy to watch the door or greet me, suggesting the enforcement of a concentration regime. The range of people who passed through during my many visits to these control rooms can be divided into three categories. First, there were the routine visitors, who came most often and were integrated into the day-to-day work of the control room: cleaners, colleagues from patrol boats, technicians (usually external) for repairs and updates, and food suppliers. Then there were the organisational visitors, who were less predictable and less frequent: middle and senior management, political and technical advisors. The third group always came with someone from the second: external software developers for introductory visits and beta testing, internal guests, dignitaries, members of the (local) public.

When I visited the Nijmegen control room for the first time in 2016, Malik opened the door. Malik was the janitor and was busy mopping the floor when he saw me through the glass door and opened it. Malik had been contacted beforehand by e-mail, which had been sent by the middle manager who had granted me access, announcing my visit. The question for Malik was to register me on some software application.

About an hour into my visit I wrote the following:

Someone is at the gate and Pete [an operator] blindly presses the button to open the door. Edwin [also an operator] responds: "You shouldn't do that, it could be AI

Qaeda." Pete replies: "They're already here," and slaps Malik on the back. Everyone laughs. "Just kidding," says Pete. A little later, [operator] Hank, who is clearly younger than the others, says that there was a time when he would ring the doorbell of a Rijkswaterstaat building and always say: "Al Qaeda, coming to blow everything up!" This always resulted in the door actually being opened. (Field note 6.12.16)

In this case, the second and third phases of gatekeeping, opening the door and social acceptance, are closely linked. Those for whom the operator won't open the door, terrorists, and those whose presence he won't socially accept, people with migratory roots, are conflated, while the actual threat is met with absurdity. The control room is the domain of white, mostly middle-aged men.

I did not speak up to the racist operator and felt like a coward for doing so. On the one hand, I thought I was taking the field for what it is, for what it shows me, and not intervening, but on the other hand, I did not feel free to intervene because of the gatekeeping power of the operators. This is particularly true of the third phase of gatekeeping, social acceptance, and as a consequence of the first phase, access. I needed permission from middle management for every single visit to the control room, and negative feedback from the operators could reduce my chances.

The glass door through which Malik saw me was quite a departure from the heavy blind doors of the older control rooms. These control rooms were thought to be under great external threat, remember Filarski's Cold War story about the expensive concrete control room in Tiel in the previous chapter. The Nijmegen control room marks a shift in Dutch control room architecture and its visibility, which I will discuss in the next section.

Designing control room visits

Air traffic control (ATC) rooms are the most visible control rooms. Towering above all other airport buildings, they have become symbols of aviation infrastructure. Despite their commanding position, the critical plane of observation has long since shifted from their windows to the collection of interfaces. This interior has been depicted many times, including in popular culture, but a visit is unlikely.

By comparison, we have seen that the operators in the Dutch inland waterway control rooms make more use of the view through the windows onto the waterscape, partly as a result of their professional biography, having been trained in the wheelhouse. Situated more independently in the landscape, the recently completed buildings differ from the pragmatic concrete structures of the 1970s and 1980s in two important ways: 1) they have taken an aesthetic turn in both material and form, and 2) they have been built to better accommodate the visiting public. Both changes point to a paradigm shift: from security to transparency.

Publics have long been invited to admire control rooms as, deployed at the frontier of state and organisational legitimacy. The first nautical control rooms, built in Rotterdam, were intended “as an advertisement for this world-class port” (Halma 2004: 13) and inaugurated by a Dutch royal in 1956. Similarly, when the late Queen Juliana inaugurated the nuclear power station at Dodewaard in 1969, the photographs that appeared in the newspapers showed her at a console in the control room. In general, the shift in infrastructure away from construction and towards efficient use coincided with an increased interest in legitimacy with the local and national public. Here the double functioned control room fits right in.

The control rooms in Nijmegen and Maasbracht are not the only ones with an eye-catching design. The design of the newer Rotterdam Port Authority control room (completed in 2010) has a striking glass façade that appears to float in the air through a steel structure. The operator consoles are spaced so that there is plenty of space for visitors to walk around them, although a centralisation effort has significantly increased the number of consoles in a room. The Antwerp Port Authority had planned a new control room with a distinctive design, but the austerity policies of the post-2008 era led to it being cancelled, one of the operators told me when he gave me a tour in 2017. It sounded as if he had to explain the less representational state of his control room (Field note 7.4.17), which he did not consider suitable for visitors.

Regulating interaction with publics has been approached differently in mission control rooms, as Peldszus details. Glass panels have long been used to demarcate the dual function of control rooms more clearly and thus “promote transparency” (Peldszus 2021: 297) while protecting concentration regimes. In the case of the American space flight access for television audiences were even “facilitated by a public relations officer on an official console position inside the control room, thereby reassuring the Western public of US capabilities.” (ibid.) Peldszus writes that in the 1970s a Soviet “control center was so small, aging and spartan that a visiting US delegation was certain that their Russian partners had shown them a fabricated facility, instead of what they believed must in fact be a secret underground bunker complex located elsewhere.” (297–8) After this the Soviets believed they needed a “presentable” control room and created a new control room with “a selective access system that led visitors including foreign delegations, dignitaries and press through a separate entrance to a mezzanine with views onto the main screen.” (298) The demarcation between the two control room functions was also made to meet demands by operators who “were wary of political officials observing them closely while working on critical tasks on the consoles.” (ibid.) The aesthetic shift associated with the control room’s promotion of programmatic values was also reflected in the installation of large central screens, but less so in the construction of eye-catching facades.

Compared to the nautical control rooms, secrecy is more prominent in Peldszus’ field. Secrecy is pursued through the design of limited access, not by keeping the

gates closed. When it comes to the norm that the socio-material assemblage of operators and consoles should be state of the art, it is difficult to distinguish between the two functions of the control room. This is also linked to the assumption that maximum agency maximises prestige. By assuming that any console that was not state of the art was a fake, the US delegation assumed that the Soviets would prefer secrecy to prestige, since it was impossible for them to compromise on agency. Though aged consoles do not rule out agency, the Soviets went along with the double function logic and built themselves a new control room. Both in space flight and many other forms of mobility infrastructure, gatekeeping practices follow from the assumption there is something to show off.

But sometimes there isn't. The Duisburg case described at the beginning of this chapter shows how prestige and expectation can clash with the mundane. Germany has no ambitions to actively coordinate traffic, instead operators simply keep track of where ships say they are on the radio and make a database entry accordingly. One operator knew that his job was not prestigious and explained that new operators were usually WSV employees on permanent contracts who did not fit in elsewhere (Field note 19.4.17). Without prestige, they were not used to visitors. Getting in, the second stage in the gatekeeping cycle, meant calling the operator on duty on his mobile phone. They had no way of opening the gate remotely. There were many more WSV staff in their building, who could enter with a RIFD door chip.

Broken door (politics)

Looking at the photos I took of the entrances, I noticed that I often took them after leaving the control room and otherwise from a distance, without any of the details I mention here. This has a lot to do with the CCTV cameras at the gates, which force a one-way, mediated view: I did not want the first image they saw of me to be one with a camera. I was too busy trying to get in, trying to look like a normal visiting researcher, half relaxed, easygoing. But also: I made sure that I was identifiable and clearly stated my business. Once I had completed this stage, I needed my hands for my luggage while opening a heavy door, which was only unlocked for a short time and could not be photographed at the same time. The only one I photographed relaxedly was the one where no gatekeeping was performed, which was at the Terneuzen control room (also featuring in the prologue of this book).

I had heard stories about the Terneuzen control room from an operator who worked there: it was dramatically understaffed, morale was low. It would be difficult to get into that control room, I thought: why would they want a nosy researcher around? At least that was my experience of the Dordrecht control room, and I deduced that more controversy meant less access. The only contact I had in this region was a senior manager at Rijkswaterstaat, who had previously granted me access to another control room. She replied to my email by copying a local manager, who sim-

ply replied that I was welcome and that I should call before I arrived. So much for phase one.

Figure 29: Broken intercom at the Terneuzen control room.



Terneuzen is a town in a strip of Dutch land called Zeeland Flanders, which has no land connection with Belgium apart from a tunnel under the Western Scheldt—the estuary of the Scheldt that connects Antwerp to the North Sea. The region is struggling with depopulation and is not only geographically but also politically peripheral to the Netherlands. When I reached the gate shielding the control room premises, it was open, the intercom taped over with a piece of black garbage bag (Figure 31). The reinforced control room door had an intercom with a CCTV camera, but it was unlocked. The idea that something critical, prestigious and potentially vulnerable was taking place here, as suggested by the architecture, protocol and attitude of other Rijkswaterstaat control rooms, was absent. So the second phase of gatekeeping was virtually non-existent.

As for the third phase of gatekeeping: only afterwards did I realise that during my twelve hours in the control room no one ever asked me what I was doing. In other control rooms, I always had to declare my interest and my independence from management before anyone would talk to me. In those control rooms, not only was the entrance guarded, but the operators still had positions to defend within the larger

organisation. To complain is to signal a transgression of a norm, a deviation from the desired state. This has been the case in many control room industrial disputes, of which there have been many—most dramatically the air traffic controllers' strike (cf. Nordlund 1998; Vaughan 2021). Often, the conflicts can be traced back to privatisation, austerity policies or shortages of operators due to an ageing workforce. For these conflicts to be played out in public requires a strategy of public mobilisation, which the Terneuzen operators had abandoned.

The dual function of the control room—coordinating complex patterns of vessel movement and contributing to the prestige and legitimacy of the organisation and the state—was only half-heartedly achieved, if at all. The traffic situation was complex, as was the layout: amid strong tides and through narrow channels along sandbanks, ocean-going and inland vessels sailed at radically different speeds and followed different courses with contrasting manoeuvrability. I was still impressed by the ability of the operators to avoid dangerous situations. I had by now learnt to assess this somewhat, but the ability was not demonstrated in a performative way. The Dutch state, in the form of its most prestigious agency, Rijkswaterstaat, has little interest in taking public credit for this. It is important to note that the control rooms along the Western Scheldt ultimately serve a foreign port: Antwerp. Through a bilateral treaty, the Dutch state has committed itself to coordinating traffic on the water. The Terneuzen control room is therefore not so much a promise to the local public. It is further implied that prestige, legitimacy and accountability are only sought within national borders, as long as local publics carry clout.

The rubbish bag used on the broken gate at Terneuzen implied that someone was going to repair it at some point and protect it from further deterioration. The screening of the control room area may have been more to prevent it being turned into a public car park, which does not appear to have happened. Although the control room is visually present in Terneuzen, it is located on a separate pier. Perhaps this physical isolation, in a sparsely populated area in general, is what prevented random curious people from going up there when gatekeeping was literally abandoned.

Historicising gatekeeping, seeing control futures

Adrian Johns said that “the practices of gatekeeping—those of keeping gates open as well as those of shutting them—need to be historicized” (Edwards et al. 2011: 1418). This section does just that, with a few additional dimensions: 1) who is let in, 2) why, and 3) how is this reflected in a particular organisation of space, but also vice-versa? 4) how does the distribution of space invite particular gatekeeping practices?

The historical shift from security to transparency took place between the 1970s and the 2010s (which is not an absolute, but a shift in emphasis), but especially in the 2000s. The control rooms studied here have long sought legitimacy for their state organisation, both in terms of accountability and prestige. The historical shift

has played out in the following ways along the dimensions listed above, through the three phases of gatekeeping—gaining permission, opening the gate, social acceptance:

First, more and more members of the public were allowed direct access to the control rooms, whereas previously outside media and communications staff had been invited to record and distribute the work of the control rooms. Dignitaries were always brought into the control room as part of the process of gaining prestige and legitimacy through privileged networks. Such visitors went through all three phases, although invitations made the first less visible and authority made the third less important. Colleagues such as patrol boat crews did not need permission, they still relied on the operators to open the door, but social acceptance was easy as they were part of the same nautical culture.

Second, and by now well known, control rooms in general, and infrastructure control rooms in particular, became the primary place where organisational action was made visible, and thus instruments of representation. There was not much else to show, the age of dramatic intervention was over.

Thirdly, the resulting double function of the control room meant that operators had to regularly open the gates to outsiders, adding a performative element to their work. The expectation of regular visits requires a socio-material assemblage in which gate, operator and other control room work can be smoothly aligned. When prestige and legitimacy are not actively sought, no time is allocated for gatekeeping, nor are smooth gatekeeping assemblages organised, as the German case shows.

Fourthly, once the presence of visitors is more actively integrated into the design of the control room, the actual gatekeeping, phase two, becomes less and less a task of the operators and shifts to middle management. They see their role as both keeping the operators in check and giving tours, or, as in the case of the Maasbracht control room floor manager, they appoint another layer of management to do this. With the rise of these control room tours, the third phase of gatekeeping—social acceptance by operators—becomes largely irrelevant (and longer stays for ethnographers less likely). The key instrument in this constellation is the concentration regime. What is otherwise a primary gatekeeping motive for the first function of control rooms—coordinating and securing movement and stasis—now becomes an instrument for keeping operators in a performative mode, behind the glass windows if there are any.

This points to a deeper truth about many infrastructure control rooms, obscured by the prestige they seek: within infrastructure, they are the cheaper solution. But by that logic, control rooms, and especially the labour, eventually become too expensive. Decades of meticulous cost-cutting will then come knocking on the control room door. Centralisation of control rooms is one way to reduce costs, sharing the previously exclusive control room perspective with ordinary traffic participants is another. A third way, building the control room for what was originally a secondary

purpose—legitimacy and prestige—gives it a new lease of life. Pete, the policy advisor from chapter one who first let me into the Dordrecht control room, predicted that any further centralisation of nautical control rooms would be combined with the design of a visitor centre (Interview 8.6.15).

3.4. Conclusion

All this points to a deeper truth about many infrastructure control rooms, obscured by the prestige they seek: within the infrastructure, they are the cheaper solution. But by that same logic, control rooms, and especially labour, eventually become too expensive. Decades of meticulous cost-cutting would eventually come knocking on the control room door, which materialised in operators speaking out on national television in 2015. In the history of infrastructure, the first step was to move away from large physical assets and focus on more efficient use. The second step was further centralisation of control rooms, and sharing the previously exclusive control room perspective with ordinary traffic participants is a third. But there is a fourth: building the control room for what was originally a secondary purpose—legitimacy and prestige—and giving it a new lease of life. Pete, the policy advisor from chapter one who first let me into the Dordrecht control room, predicted that any further centralisation of nautical control rooms would be combined with the design of a visitor centre (Interview 8.6.15).

In this chapter, I have considered infrastructural control rooms and their relationship to publics constructed through representation and the reception of visitors. While control rooms have been built for an increasing number of domains, they have become less exclusive than their historical reputation would suggest, even though this reputation may be the very attraction of a visit. Control rooms operate in a different paradigm, one in which state authority is less obvious and public spending is under greater scrutiny. So they began to look different, with concrete replacing glass and their interiors optimised not only for operators but also for visitors. This also made them more expensive to build, but their purpose was multiplied, for example by including meeting rooms, which are more attractive in a chic location. In general, the transparent war room is also a post-Cold War trend, and it remains to be seen if and how the current level of openness will change now that we live in a multi-polar world with a renewed Russian threat.

The acoustic and visual dimensions need to be separated when designing the structural possibility of control room visits. We saw in the previous chapter how the kitchen in the control room in Dordrecht brought in other Rijkswaterstaat staff and disturbed the work acoustically. Until the end of the 1990s, control rooms were relatively small, and they were extended to accommodate more operators, as in Dordrecht, where the tasks expanded, prompting a renovation. In a newer generation

of nautical control rooms in Nijmegen and especially in Maasbracht and Rotterdam (Botlek), whether for traffic or locks, ceilings are higher, consoles are further apart and larger windows let in more daylight.

The approach to control rooms in media studies is one of a wide horizon, both synchronically and diachronically. At the same time, studies that actually had their own material from within the control room, briefly united under the umbrella of centres of coordination, hardly took the larger phenomenon into account. Deleuze's "societies of control" were never a concept there (1992). A third option is presented in this chapter, and in this book in general, by showing how the double function of control works in practice, which is more mundane and sometimes contradictory, as the circulation of the same photo in section 3.1 shows.

So far, the focus has been on how the control room was brought into circulation through visual representation, or how visitors were brought into the control room. In the next chapter, we will take a look at how operators bring the control room to local audiences, one screenshot at a time.

