

Chapter 14

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AN INSIDERS' PERSPECTIVE: HAMBURG WASSER'S RESPONSE TO COVID-19

This paper offers insights and shares the experience of Hamburg Wasser – the second-biggest German water and wastewater utility – in response to the Covid-19 pandemic, up to August 2020. As employees of this public-owned utility, we focus on the challenges and measures taken in our organizational structure to ensure delivery of water and wastewater services without compromising stability and safety, examining our emergency planning protocols, how they evolved during the crisis, and lessons for future crisis management and day-to-day operations.

INTRODUCTION

Hamburg Wasser is a group of public water and wastewater utilities providing water and sanitation services to more than two million consumers in the metropolitan region of Hamburg, Germany. There are two separate legal entities in the company – Hamburg Water Works (Hamburger Wasserwerke GmbH) and Hamburg Public Sewage Company (Hamburger Stadtentwässerung AöR) – but

they were combined in 2006 under one roof with a common aim, structure and procedures, as well as identical management for the first three hierarchical levels.

Both companies have always been owned by the Federal State of Hamburg. In 2004, citizens petitioned for a referendum against their potential privatization, and were successful, resulting in legislation in 2006 that guaranteed the public supply of water. The act reads as follows:

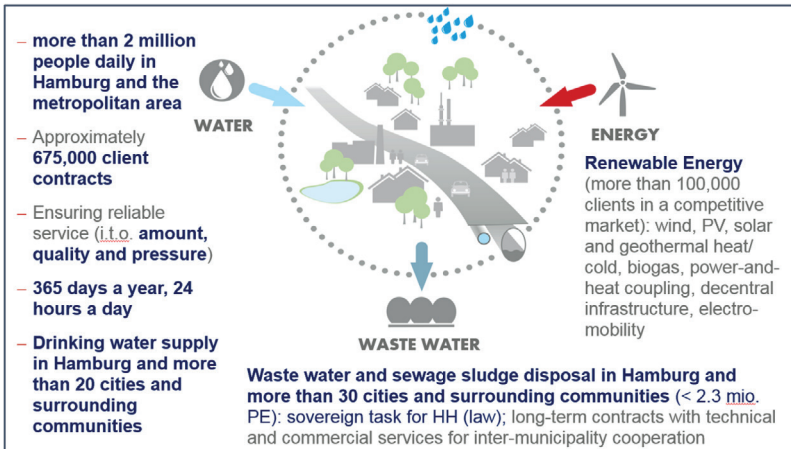
The public water supply is the responsibility of the Free and Hanseatic City of Hamburg as the state task. If this task is carried out by third parties, their shares are fully owned by the company of the Free and Hanseatic City of Hamburg. (Freie und Hansestadt Hamburg, 2006)

Hamburg Wasser's mission is to provide affordable water services to all residents and consumers in its metropolitan area, ensuring economic and ecological sustainability for future generations. In 2009, Hamburg Wasser founded a subsidiary providing renewable energy – Hamburg Energie – which has since become one of the biggest local suppliers of renewable energy in northern Germany. Another 100% subsidiary is Consulaqua, which provides an interface between a public utility and the private consulting sector. Figure 14.1 provides an overview of the company structure.

EMERGENCY PREPAREDNESS BEFORE COVID-19

Emergencies and crises in critical infrastructure facilities can lead to considerable impairment of their functionality and cause damage to broader public and economic systems (BMI 2011). The causes of these events are diverse, and Hamburg Wasser has created a variety of very specific emergency and crisis management protocols, including responses to coliform bacterial infections in the network, storm tides, and terrorist threats.

Figure 14.1

Hamburg Wasser at a glance

The emergency plan for pandemic situations consists of three main aspects: internal management and responsibilities in the event of a pandemic; concrete proposals for measures to reduce the incidence of infection and to protect vulnerable processing areas; and minimum staffing requirements to maintain adequate levels of water supply and sewage disposal. An organizational instruction and crisis management manual describes structures and procedures to be applied as soon as normal operations are no longer possible. The focus is on maintaining a crisis management team with 18 defined staff and assistance functions that can meet in different configurations depending on the situation.

In addition to the provision and development of theoretical structures and procedures, capacity building of crisis management members is a central instrument of our strategy, with regular training and testing of structures and procedures to anticipate specific scenarios. The members of the crisis management team come from the different operational areas of the company and in some cases do not know each other. Training sessions provide a network and familiarize members with the procedures. At the end of 2019, Ham-

burg Wasser conducted just such a joint team exercise, in cooperation with the electricity and gas network operators in Hamburg, to strengthen networking between the infrastructure operators in case of a crisis.

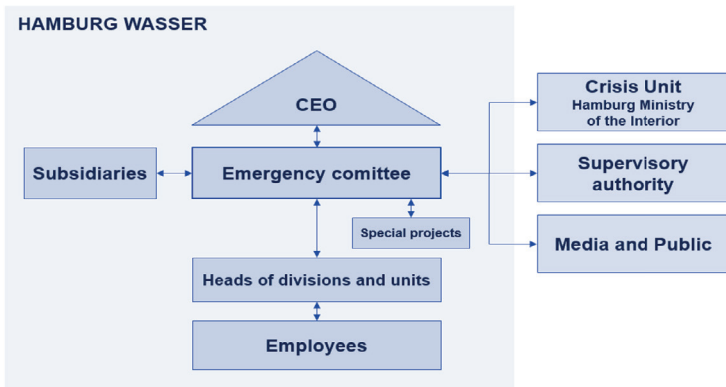
EMERGENCY MANAGEMENT DURING COVID-19

Shortly before the first coronavirus case in Hamburg was identified, it was decided to set up a cross-divisional emergency committee. Hamburg Wasser considered the pandemic situation as an “emergency” for the company rather than a “crisis.” Crisis management tools were applied regardless. Due to the pandemic scenario, all meetings of the emergency committee were conducted exclusively via telephone and video conference.

The first meetings were a test run in terms of digital communication as well as a first attempt to grasp the extent of the work ahead. The structural preparations and training of the past few years paid off and were continuously updated and revised. Responsibilities and communication structures were defined and working methods were coordinated.

Figure 14.2

Communication structures of the Emergency Committee



Including vacation replacements, 23 people from different departments were part of the emergency committee, as follows:

- **Head of Operation:** Manages the entire organization and moderates the situation meetings. He/she has the authority for final decisions in the emergency committee. The Head of Operation keeps close contact with the two CEOs and the staff councils.
- **Coordination Team:** Organizes and ensures smooth operations of the committee. Prepares situation meetings in cooperation with the Head of Operation.
- **Staff and Health Team:** Draws up basic recommendations for dealing with the pandemic, especially from an organizational, medical and occupational safety point of view.
- **Emergency Operation Team:** Develops special emergency plans for the various organizational units (such as operation and maintenance) and prepares for potential worsening of the situation.
- **Materials Management Team:** Monitors inventories and the procurement of key consumables.
- **Communication Team:** Establishes internal and external communication during the pandemic.
- **Information Technology Team:** Coordinates all technical prerequisites associated with the change in working methods (e.g. tools for video conferencing).

The focus of the emergency committee was to centralize the collection of information, assess the situation, identify critical developments and prepare responses, all under the motto of “staying ahead of the development.” In addition, the emergency committee ensured the comprehensive exchange of information and communication within the utility.

Major problems were discussed in the emergency committee and secondary issues were delegated. Proposed solutions were prepared in smaller working groups and presented to the emergency committee for decision making. Inquiries from organizational

units were individually handled by the responsible delegates. Those responsible for the topics decided which issues needed to be discussed within the emergency committee and which could be decided on their own.

The following practices have proven to be useful for the efficiency of the emergency committee:

- Daily meetings
- Tracking of the external situation in Hamburg, Germany and other countries
- Tracking of the internal situation, especially of personnel, by means of a regular query in the operating areas
- Fixed and standardized agenda and good preparation of visuals for the meetings to enable efficient decision making

To ensure transparent and consistent internal communication, managers and employees were regularly updated via e-mail, intranet and video. They received information on the development of the situation regarding coronavirus exposure in the company, personnel management issues, and instructions about decisions and latest hygiene regulations. The emergency committee acted as a focal point, communicating with a uniform e-mail address.

COLLABORATION WITH OTHERS

Contacts with other water suppliers and network operators were established at various levels. Best practice information was exchanged with bilateral and informal contacts. A regular exchange took place with the company doctors of two other public operators from the heating network and the electricity network. And given that Hamburg Wasser does not have the necessary expertise to assess the virus situation, we rely on the assessments and recommendations of the German Robert Koch Institute and the Federal Ministry of Health.

At the CEO level, telephone conferences of the public operators in Hamburg took place regularly under the direction of the super-

visory authority. During the pandemic, the supervisory authority regularly discussed, prioritized and centrally provided protective equipment (mainly special protective masks such as FFP2 or FFP3 masks). Experience has shown that the basic measures taken by the public operators were all similar (clear hygiene regulations, working from home, separation of units), but differed in detail depending on the internal circumstances.

MEASURES TAKEN TO ENSURE ACCESS TO SERVICES

It quickly became clear that the coronavirus pandemic would not be over in a few weeks, and that the situation would continue to worsen. Accordingly, the aim was to maintain the “normal operation mode” as long as possible. The following strategic action lines were developed by the emergency committee:

- **Delaying the spread of the virus and minimizing concurrent diseases.** The objective was keeping the number of people who fall ill at the same time as low as possible and to gain time to be able to make further preparations (e.g. increasing treatment capacities in hospitals, avoiding peaks in the burden on the health system, developing antiviral drugs and vaccines) and to avoid internally widespread simultaneous illnesses/quarantines.
- **Protection and support of particularly affected employees.** The objective was ensuring the health of employees as a corporate social responsibility.
- **Preparation of an emergency operation for a worsening of the situation.** The objective was to ensure the operation of the company if all employees not required according to minimum staffing levels are sent home and a relevant number of employees fall ill.

Concrete measures to operationalize these action lines were developed by the emergency committee. The focus of the measures was to limit contacts for all employees (managers, support staff and

frontline workers) and to allow only contacts necessary for operations under special hygiene rules. For employees in the offices, they were working from home where possible (1300 employees out of 2400 could work from home, see Figure 14.3). Others, whose work content did not allow them to work remotely, or who are technically unable to do so, continued to work on site with specific hygiene rules and in strictly separated teams. The IT services for networks, hardware, and software were improved and upgraded very quickly so that staff could work adequately from home (measures included increased laptop availability and server capacities).

For employees in the operation units, a consistent decentralized system was put in place by taking advantage of the regional structure of operating units such as waterworks and network operations. The number of employees in the departments for operation and maintenance were reduced substantially. The active (on-site) and passive (at-home) teams alternated weekly and had no contact with each other. Access to particularly sensitive key units, such as control rooms, was possible for required operating personnel only. Overall, the company has reduced on-site presence of staff from approximately 75% to 20%. Notably, sickness rates have dropped by about 50%.

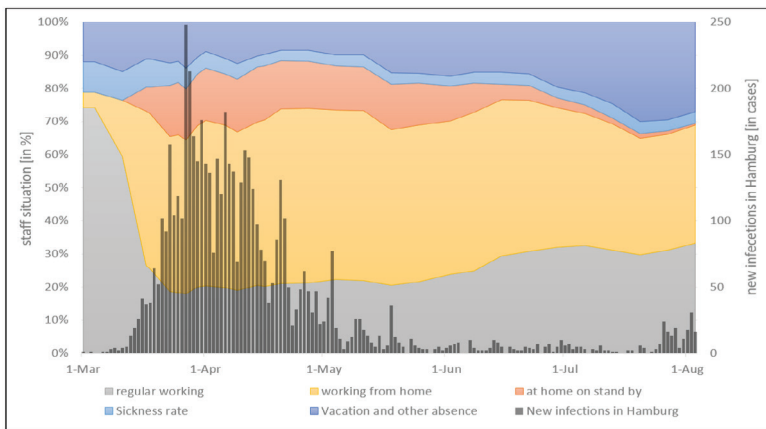
Strictly tightened hygiene and occupational health rules were also introduced. The focus was on internal contact restrictions, such as a 1.5m distance rule, no shaking hands, and wearing face masks. The company increased the cleaning routines of the company buildings, especially in social rooms, restrooms, changing rooms and showers. Also, door handles and handrails are cleaned at least daily. Additional safety rules along the Covid-19 occupational safety standard of the Federal Ministry of Labour and Social Affairs (BMAS 2020) were adopted for office workplaces, in-person talks and meetings, the use of company cars, and the organization and segregation of company buildings.

Meetings are avoided as much as possible, and telephone and video conferences are used if necessary (e.g. job interviews via vid-

eo conference). Further measures have been taken to reduce contact between external parties and customers, including the closure of the customer centre and training centre, as well as pausing the exchange of operating water meters. Staff coming home from holiday in “risk regions” are not allowed to enter the company premises. Furthermore, several risk assessments in terms of occupational safety were prepared, such as for office workplaces, the use of face masks and ventilation systems. Individual arrangements had to be made for the postponements of test obligations and audits.

Figure 14.3

Development of the staffing situation of Hamburg Wasser and number of Covid-19 infections in Hamburg from March to July 2020



To protect and support employees with an increased health risk, they can agree with their supervisor on how their work can be performed (e.g. working from home). In addition, shopping and personnel transport services are available for those affected by school and daycare closures.

Financial and organizational arrangements for staff were also made. These include continued salary payments, childcare, arrangements for recording remote working hours, and a refund of public transport tickets. In addition, changes were made to deci-

sion-making powers for digital work processes (especially signatures and approvals).

In terms of consumer-related measures, the Federal Ministry of Justice put civil legislation in place authorizing deferments on water bills. All customers – households as well as industrial – were informed of this. To date, however, very few private or industrial customers have requested it. In addition, it was decided to suspend all water cutoffs. Household water meter changes were also suspended, and the customer service centre was closed to physical visits.

CRITICAL PROCESS COMPONENTS AND EMERGENCY PLANS

The highest risk in the pandemic has been the possibility that a process breaks down because of the lack of staff present on site. To be prepared for an acute exacerbation of the situation, a systematic approach was developed to identify staff shortages in critical processes. The methodology is based on a German norm (DIN-EN 15975-2) and was further adjusted to adapt to emerging circumstances (DIN 2017). This critical analysis process provides information about the modules that are necessary to provide the services and how many personnel are available in which place.

This analysis was carried out according to the following three steps:

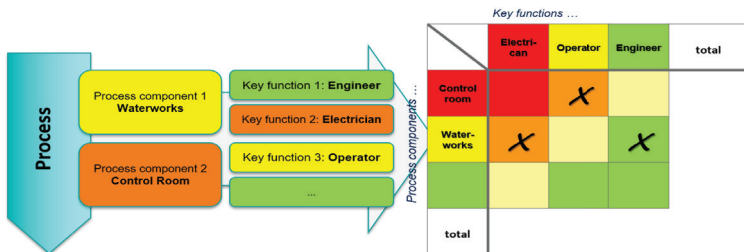
1. All critical process modules were identified. A critical process module is a building, plant, activity or process that is necessary for ensuring water supply and wastewater disposal including all support processes (e.g. waterworks, pumping station, laboratory, IT infrastructure).
2. All key functions were identified. A key function is one occupied by staff that are absolutely necessary to maintain a process in an emergency situation (e.g. plant engineer, personnel from the control room, electrician, fault clearance service).
3. Process modules and key functions were evaluated in terms

of their criticality using a traffic light system. A systematic evaluation matrix was developed for the assessment of personnel availability, considering the required personnel, the maximum number of employees available and the separation in space and time of employees. This is intended to check how many employees are required for a process module, how many are sufficiently qualified and where they are located.

In the end, 59 process modules and 128 key functions were identified in a risk matrix. The results showed an overlap of particularly critical processes with particularly critical key functions. To reduce these risks, special protective measures had to be defined and implemented. Figure 14.4 illustrates this risk matrix.

Figure 14.4

Risk matrix analysis for Hamburg Wasser



Measures to reduce the vulnerability of specific process components were carried out in addition to the measures mentioned above such as physical and temporary segregations. These include:

- Creation of personnel reserves (e.g. short-term rudimentary training of employees)
- Integration of external service providers (e.g. construction companies for necessary construction work)
- Work by employees who are under quarantine
- Isolation of employees on site to protect them from infection

A procedure to be followed in the event of a quarantine require-

ment has been developed with the health authorities. For this purpose, an emergency plan has been drawn up to define the general conditions that must apply to ensure that the operation of the technical facilities can be operated or maintained even by employees who are under quarantine.

THREE-STAGE RECOVERY AND RETURNING TO A “NEW NORMAL”

Although infection figures in Hamburg decreased significantly between April and May 2020, the virus still is circulating. For the emergency committee it is therefore necessary to develop options for coping with a “new normal.” The following guidelines determine the recovery strategy: limit potential chains of infection by continuing to segregate organizational units; increase on-site presence gradually; implement special hygiene and protective measures for urgent operational contacts; and use separate protective measures for critical key functions.

Hamburg Wasser has opted for a three-stage process to limit potential chains of infection and gradually increase on-site presence (see Figure 14.5). The process will depend on a drop in new infections in Hamburg and surrounding federal states. If these are stable at a low level (e.g. < 25 per week per 100,000 inhabitants), it is conceivable that restrictions can be relaxed. However, infection numbers at Hamburg Wasser itself are also relevant. Here it is difficult to give a concrete guideline, since the number as well as the potential chains of infections and quarantine effects must be taken into account. To be able to evaluate how relaxing restrictions affects infection rates, intervals between the stages should be at least four weeks.

The step-by-step plan was used to define a target direction and a framework. It enabled an identical procedure at all organization units of the company. However, adjustments to the specific peculiarities in each unit were necessary. If, for operational reasons, it was necessary to deviate from the outlined procedure, this would

be done by the local managers. In such cases, a risk assessment must be carried out in which the effects of a potential infection are estimated, and additional protective measures are taken.

Apart from the many arrangements made during the pandemic, which had to be considered in the recovery plan, two initial situations were required:

- Employees working from home must return to the office and operating sites gradually
- Segregated teams must return completely to their sites to meet operational and maintenance demands

Figure 14.5

Hamburg Wasser's three-stage recovery plan



LESSONS LEARNED

In summary, the measures taken have been successful so far. Hamburg Wasser has not entered a crisis and can deliver reliable services without compromising service levels or quality, while contributing to the decrease of infection in Hamburg. Only a few employees of Hamburg Wasser have been infected by the virus, and with measures such as remaining under quarantine after returning from vacation there has been no further spread among colleagues. Internally, there was widespread solidarity and understanding of the situation among the staff. In particular, employees appreciated the transparent communication and sharing of information.

Although the crisis has not yet ended, some of the key lessons learned thus far are:

- **Identifying key challenges:** Reorganization of daily work and communication were the two central tasks. The reorganization of work within a very short time has been very successful. More than 1000 employees worked from home. Meetings and events were prohibited, and operating personnel were kept separate as much as possible and significantly reduced on site. Transparent communication was one of the most important instruments to give the employees security and confidence in the company, so that all measures were accepted. At the same time, there was a high level of readiness for any measures that might be considered, such as isolation of different plants.
- **Emergency management:** Even though there was no crisis from the perspective of water supply and wastewater disposal, we made use of crisis management structures. Our crisis management, which is based on theory, has also proven itself in practice. Above all, the experience gained through regular crisis management exercises since 2015 have been an important success factor. The centralized organization by means of an emergency committee, in which all important areas of the company were represented, was a success. The regular and transparent presentation of information and decisions to the staff was a key success factor. It was important to coordinate continuously and very closely with the CEOs, but not necessary to include them in the emergency committee meetings. The CEOs showed a high level of trust and confidence in the work of the emergency committee.
- **Decision making:** Even though the head of the emergency committee formally had the authority to make unilateral decisions, no use was made of it, even if there were controversial discussions in the emergency committee meetings. The final decisions were always based on collective discussion and consensus.
- **Long-term crisis:** During the first phase of the pandemic, it

was not clear that the changes made would be in place for a long time. Initially, actions were only taken as a reaction to the current situation. Only gradually were more long-term perspectives developed and strategies derived from them.

- **Preparing for a pandemic:** The operation of water and wastewater utilities can be influenced by many different external scenarios. Floods, power cuts, hacker attacks or a terrorist attack are just a few examples. When it comes to organizational, technical or even mental preparation for hazards and risks, there is always a tension between necessity and economic efficiency. Although a pandemic was considered an unlikely scenario, basic principles for dealing such a crisis were in place in the emergency plan, which proved to be very helpful and gave useful guidance. However, the planning was not very detailed. For many problems, especially for organizational aspects, solutions were developed as the crisis unfolded.
- **Stockpiling of consumables:** There were considerable supply bottlenecks, especially for protective clothing and hygiene articles, with no special stockpiling in advance. In particular, the availability of FFP2 and FFP3 masks for work on wastewater facilities was problematic at the beginning of the pandemic. This must be considered in future emergency planning.
- **Technical requirements:** Independent from the pandemic, it was fortunate that about 80% of our employees had been equipped with laptops a few months before. This made working remotely very easy and laptop access can now be used as an important basic requirement for working from home. The company and its staff have gained a lot of experience with digital tools, which will be helpful for future crisis situations.
- **Cooperation:** Collaboration and exchange of ideas on “how someone else is doing it” proved very useful. At the same

time, there was a high organizational workload, especially at the beginning of the pandemic, leaving little time for extensive exchange and coordination with other water or wastewater utilities. Nevertheless, regular networking within the sector and with other public companies has been beneficial and should be further encouraged, allowing for a faster exchange of ideas in the event of another crisis.

CONCLUSION

The findings from the emergency response at Hamburg Wasser are still at a very early stage, but there are two outcomes that are quite clear as we look forward to longer-term planning. The first is that our positive experiences with updated IT equipment indicate there will likely be more working from home in the future. If work processes and team cohesion allow, this could be up to 60% of working time. As a result, office space requirements may not be as high, and the redesign of workspaces will need to be considered.

Second, all our work will likely be more digitalized. Paper use will be reduced, and more digital signatures implemented. Certainly, more meetings will be held via videoconference and telephone. Online meetings are often more effective, focused and shorter (although physical meetings on site will not be completely replaceable). In addition, video or telephone conferences can save travel time and thus be more ecologically sound. In terms of operation and maintenance, there was already a high level of digitalization before Covid-19, and there will probably be no fundamental change in the technical installations. When working in the field, however, it will be more common to start directly from home, which will save travel time too. This development can be supported by the expanded use of digital tools and equipment.

Hamburg Wasser is confident that for many employees, the daily routine will change after the pandemic. Regular working from home and the use of video conferencing are most likely the essen-

tial changes in the future of everyday working life.

REFERENCES

- Bundesministerium des Innern (BMI). 2011. Schutz Kritischer Infrastrukturen – Risiko- und Krisenmanagement. Leitfaden für Unternehmen und Behörden. Berlin, Germany: BMI.
- Bundesministerium für Arbeit und Soziales (BMAS). 2020. Sars-CoV-2-Arbeitsschutzstandard. Berlin, Germany: BMAS.
- Deutsche Institut für Normung e.V. (DIN). 2017. . DIN-EN 15975-2 Sicherheit in der Trinkwasserversorgung – Leitlinien für das Risiko- und Krisenmanagement – Teil 2: Risikomanagement. Beuth-Verlag. Berlin, Germany: DIN.
- Freie und Hansestadt Hamburg. 2006. Gesetz zur Sicherstellung der Wasserversorgung in öffentlicher Hand HmbGVBl. Nr. 41. S. 505. <https://bit.ly/3n0AGZJ> (accessed October 20, 2020).