

# Banishing the water

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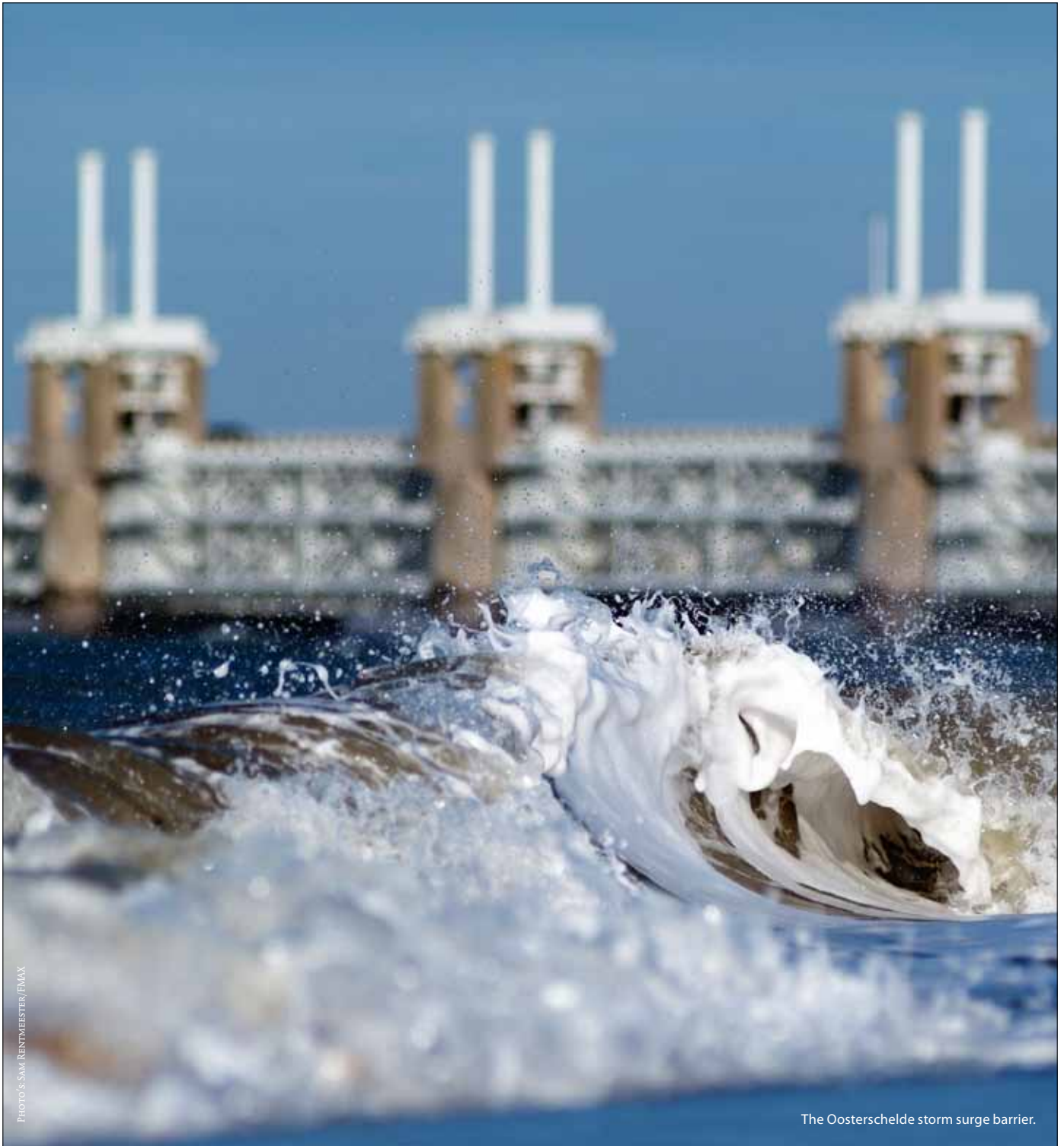


PHOTO: SAM RENTMEESTER/FMAX

The Oosterschelde storm surge barrier.

**The Delta Commission issued its final report in 1960. At that time, construction of the Delta Works was already well under way. Nearly five decades later, in 2008, the “second Delta Commission” issued its report.**

**There was a world of difference between these documents.**

FRANS GODFROY

In the night of 31 January/1 February 1953, the dikes in southwestern the Netherlands burst. At the time, plans had already been laid for a “new Delta”. Prior to the Second World War, an outline plan had been developed for taming the waters around the islands of the province of South Holland. Once the war ended, those plans were immediately put into action. Meanwhile, however, those responsible failed to closely monitor the existing dikes. The consequences were fatal.

The urgency of the situation was dramatically brought home to the entire country. Less than three weeks after the disaster, the Dutch Minister, Mr. J. Algera, installed the Delta Commission, which was tasked with drawing up both short term and long term measures. The commission’s mandate clearly stated that they were to focus on closing off the estuaries, with the exception of the Westerschelde and the New Waterway. The Delta Commission was chaired by A.G. Maris, the Director-General of Rijkswaterstaat (the Directorate General for Public Works and Water Management). As might be expected, TU Delft (formerly called TH Delft) was well represented on the commission. Many of the commission members were already acquainted with one another through the course of their work as civil engineers. Professors Pieter Jansen and Johannes Thijssse were on the scientific staff at TU Delft, with each of them holding two posts. Prof. Jansen was also chief engineer at Rijkswaterstaat, while prof. Thijssse’s second post was executive director of the independent Hydraulics Laboratory at Delft. In 1956, Prof. Jansen was also appointed head of the Delta Department.

The decision to close off the estuaries was an obvious one. It involved a significant reduction in the length of coastline, which constituted a major step forward in terms of coastal protection. An incidental benefit was that roads running along the top of the dams would make the islands of Zeeland much more accessible. A second primary objective of closing the estuaries was to push back the salt water: the salinisation of coastal areas - that other centuries-old threat from the sea - was now a thing of the past.

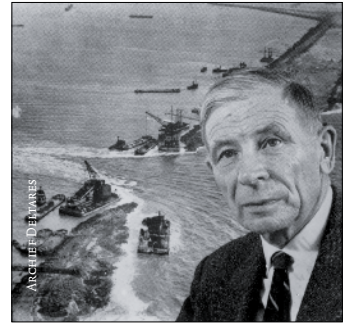
### Bureaucrats

Prof. Jansen was a leading light of the Delta Commission and of the Delta Department. He graduated from TU Delft in 1926 and was subsequently involved in the Zuiderzee Works, which led to the construction of the Afsluitdijk. In 1944, Prof. Jansen was appointed head of the Dienst Droogmaking Walcheren (Walcheren Drainage Division). During the WWII battle for the southern Netherlands and Belgium, large parts of Walcheren Island disappeared beneath the sea when the Allies bombed its dikes.

The author A. den Doolaard (the pseudonym used by C.J.G. Spoelstra) was appointed to the Walcheren Drainage Division in February 1945. Having recently returned from wartime exile in Great Britain he was now serving as an Information Officer to the Military Authority. In his autobiography, Den Doolaard describes Jansen as “a little man with friendly eyes, an ironic smile, and a voice adept at cutting sarcasm”. Prof. Jansen and Den Doolaard got along very well, and the professor figures prominently in Den Doolaard’s roman-à-clef, *Het verjaagde water* (The banished water), as the fictional engineer Van Hummel. In this story, which centres around the reclamation of Walcheren from the sea, Van Hummel works shoulder to shoulder with his contractor/supervisor Berend Bonkelaar (in real-life the legendary Kobus Kalis, the man behind the success of the dredging firm Boskalis), battling not only against the water but also against the bureaucrats:

“The mandarins hummed and hahhed, then put forward their objections again, starting at the beginning. Bonkelaar rolled a cigarette. When he’d finished, he lit his cigarette and threw the match to the floor, just in front of their feet. One of the mandarins had just launched into a stream of officialise, “Might possibly merit some consideration ...” or something like that. Bonkelaar snorted, emitting a cloud of smoke in the process, and interrupted the man: “Nonsense, gentlemen. I can see under the water, and you can’t.”

The scene refers to an actual conflict between Jansen and Theodoor Tromp, the new Minister of Water Management, who had been appointed one month before the Allied liberation of the northern Netherlands. Minister Tromp was dissatisfied with the way matters were proceeding. He suggested postponing the reclamation until further studies were completed, and appointed a naval officer (Van Houweninghe) as head of the Walcheren Drainage Division. Some say that Jansen then threatened to resign from Rijkswaterstaat, whereupon the status quo was restored. According to another version of this story, Van Houweninghe advised the minister to dismiss Jansen and Kalis from the organisation, at which point Bergansius sided with Jansen. Whatever the truth of the matter, the minister decided to make the best of a bad job, cancelled the appointment of Van Houweninghe, and allowed the reclamation work to proceed as planned. The work was completed in February 1946, only two months behind schedule. Experience gained in the construction of the Afsluitdijk came in very handy in the reclamation of Walcheren. This reclamation work, in turn, also proved to be very useful in the Delta Works project, which was launched in 1953, immediately after the flood disaster. As in 1944, there was no time for everything to be scientifically investigated and ▶



Prof. J.Th. Thijssse.

thoroughly tested in advance. Prof. Jansen had to solve many problems quickly, on site. Experimental investigations of these issues at the Delft Hydraulics Laboratory did not occur until much later. Prof. Jansen, in particular, had to pull out all the stops in order to deal with the complex tidal movements in the interconnecting holes. Caissons were just one of the innovations that Jansen successfully introduced during the Walcheren project. Some of those involved were not exactly bowled over by this idea, however. Caissons could be difficult to handle; they tended to break loose in rough seas, and they also made it difficult to achieve a hermetic seal. The advantage of using caissons however was that the holes could be filled in faster than with stones and clay. Given Jansen's tight schedule, this was a very important consideration. Caissons made a significant contribution to the Delta Works. Prof. Thijsse, who was a member of the Delta Committee and Head of the Hydraulics Laboratory, supported Jansen in this. The Hydraulics Laboratory carried out a great deal of work on behalf of the Delta Department and the commission. The Walcheren Drainage Division had its own Hydraulics Department, for taking measurements and making observations. With a workforce of about 200 people, this department was charged with studying the movements of water and sand. The role of the Hydraulics Laboratory was to conduct experiments using scale models. The Delta Model, which was laid out on the roof of the laboratory and had been constructed prior to the calamitous floods of 1953, came in very handy for this purpose. At the same time, in the indoor pool, experiments were being conducted on scale-models of caisson structures. This made it possible to vastly improve the caissons during the course of the Delta Works project. As he had done with the reclamation of Walcheren, here too Jansen was willing and able to defend his own methods. In the late 1950s, as head of the Delta Department, he had become involved in disputes with the director of the Port of Rotterdam and with the planners of the province of Zuid-Holland. The latter envisioned the creation of a new port city on

the Haringvliet inlet. As Chairman of the Working Group on the development of Rhine Estuary Ports, Prof. Jansen incurred the planners' wrath by issuing an advisory report to the effect that the Haringvliet was unsuitable for port operations. The argument became really heated when the planners of the Government Agency for the National Plan informed Jansen that his working group should not get involved in planning issues. The professor however was not prepared to be brushed aside in this way, stating that "a good hydraulic engineer is also a planner, and is bold enough to act as one".

### Ecological values

Yet times change. From the very outset, the security that the Delta Plan offered the southwest region of the Netherlands was virtually undisputed. There did however come a time in the age-old battle against salt water and salinisation when voices of dissent began to make themselves heard. The 1960s were marked by growing resistance to the planned closure of the Oosterschelde, a resistance that centred around one drawback of the plan; namely, that it would signal the end of all mussel and oyster farming in the area. Both the Delta Commission and the politicians of the time had simply accepted this as inevitable, with the farmers to be compensated for any financial losses incurred. Campaigners however raised a series of new objections: one was that the freshwater ponds that (according to the planners) were to be created by the closure of the estuary would actually be just a single, large pool of polluted river water. At the same time there was increasing concern for the ecological values inherent to the Oosterschelde's saltwater environment.

This issue remained unresolved for many years. Eventually, in 1974, an alternative plan for the Oosterschelde was developed. Instead of completely closing the estuary, as the original plan proposed, the new, much more expensive plan involved constructing a multiple buttress dam that could be closed in the event of a storm surge. Suddenly, the Delta Department had a lot of work on its hands. In addition to designing and building a multiple buttress dam, work was required in the area behind the storm surge barrier to prevent the salinisation of West-Brabant and to facilitate the passage of shipping.

The changing political and cultural environment of the time meant that, in a period of less than 20 years, the struggle against the encroaching sea had become much more complicated. But such was its momentum that this new development was now unstoppable. The multi-disciplinary approach favoured by Jansen back in the 1950s, when he stated that hydraulic engineers should also be able to act as planners, was as nothing compared to the principles adopted a half century later. A comprehensive "transdisciplinary" approach is the motto of the second Delta Commission. In 2007 and 2008, under the chairmanship of former minister

The Maeslant storm surge barrier at Hoek van Holland.



Cees Veerman, this commission set out its long-term plans for the future. Unlike the 1950s, there is no urgency to break ground today. However, before proceeding further, there was a clear need to set out a comprehensive vision. The government wants to use the Commission's findings "to formulate sustainable policy strategies for the coast". In its final report, the Commission explains that its mandate was broader in scope than security (and security against hazards posed by water) alone. "Accordingly, the vision also takes account of the involvement of such factors as housing and work, agriculture, the natural environment, recreation, the landscape, infrastructure and energy." This is reflected by the composition of the nine-member committee. Professor Marcel Stive, of TU Delft, occupies the only seat on the Commission reserved for the field of hydraulic engineering. The other seats are occupied by five members with connections to Wageningen University, one member with links to the Ministry of Agriculture, Nature and Food Quality, one member representing the offshore industry, and one member representing the investment world. The Veerman Commission's task was limited to the development of a vision. Accordingly, it took just one year to produce a report consisting of 134 densely printed pages. The report contains no clear-cut, detailed plans; these will have to be developed by others, in future, based on this vision.

### Beach nourishment

There are many reasons why the two Delta Commissions cannot be compared to one another. Nevertheless, such comparisons are increasingly being made, even if only because the government has presented the Veerman Commission as successor to the first Delta Commission. This inevitably gives rise to certain expectations.

One key concept in the modern approach is 'soft coastal engineering', which mainly involves the 'support of natural processes' rather than simply closing off water connections. Priority is now given to 'beach nourishment' rather than to dams.

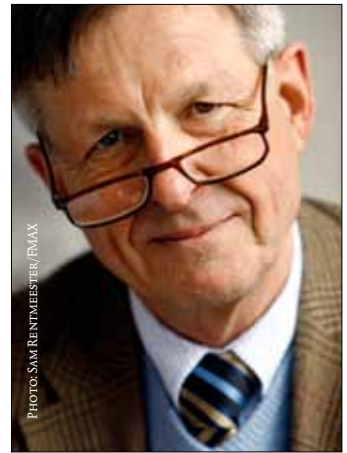
Han Vrijling, professor of hydraulic engineering at TU Delft, views this development with some suspicion. While he has no problem with the idea of widening coastlines as a means of keeping the sea at bay, he is concerned about hidden agendas: "A strip 100 meters wide is enough. However, some variants involve the reclamation of a 1 kilometre-wide strip of land, for ecological reasons. If a given measure is only partly useful in the classic sense, and if the remainder of its effect involves an environmental component, then I think we should take a clear decision on whether or not this is what people really want. In other words, clearly identify the environmental part of the measure. I have no problem with that, provided it does not erode the funding of security measures. If it were to do so then we would be making a huge mistake. So rather than funding that extra 900 meters of beach from the scarce resources

available for coastal defence, let's pay for it from the budget for nature and the environment."

To support his arguments, Vrijling points to a recent study that revealed that 24 percent of dikes are sub-standard and in urgent need of reinforcement.

Furthermore, the professor notes, the Veerman Commission, for no apparent reason, neglected to address an important principle on which the work of the first Delta Commission was based; namely, the shortening of the coastline. After 2050, when the current Oosterschelde storm surge barrier reaches the end of its operational life, the Commission sees opening the Oosterschelde to the sea again as a viable option. This was prompted by the present-day restriction of the tides, which, from the perspective of nature conservation, is seen as a disadvantage of closing the estuary. Intertidal zones are increasingly disappearing under water, due to "sand starvation", for example.

Prof. Vrijling disputes the Veerman Commission's suggestion that there was a failure to recognise this problem until it was too late to do anything about it: "The initial calculations showed that if we were to build a storm surge barrier, those plates would erode. This work was carried out by Luc Kohsiek who, until recently, was the Deputy Director-General of Rijkswaterstaat, and who is now a dike inspector in the province of North Holland. On one occasion, early in his career, Kohsiek performed this calculation for the purposes of a memorandum. The current situation is entirely in accordance with his predictions. The underlying mechanism involves the movement of large volumes of water along the channels. If, at some point, this flow diminishes, then the channel has excess capacity, and sand is naturally drawn down into it, making it correspondingly smaller. That sand has to come from somewhere. Since sand cannot easily pass through the storm surge barrier, it is instead displaced from the plates. There is nothing surprising about this. All that has changed is our perception, for nowadays we are deeply troubled by the fact that the plates are eroding. But I'm not sure that this is so troubling." Vrijling is also critical of the new plans for the Brouwersdam. The Veerman Commission wants to let water in through the Brouwersdam, thus restoring the tides to Lake Grevelingen. The commission believes this would improve water quality, which, in turn, would benefit the natural environment. "An important question to ask here is: how clean is the water that you are letting in?" Vrijling asks. "This issue should be studied before we proceed any further, because, after all, the incoming water will be a mixture of seawater and Rhine river water, and that is a far cry from the crystal clear seawater from the Bay of Biscay that they use in aquariums at Blijdorp Zoo in Rotterdam. If you're spending hundreds of millions of euro punching holes in the Brouwersdam, only to let in water polluted by chemicals, then you'd just be making a bad situation worse." <<



Prof. dr. ir. Han Vrijling.

More information:

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