EVIDENCE FOR CLAIMS PROCESSING

Ship-induced Riverbank and Harbour Damage

The use of rivers and channels for various purposes entails many conflicting interests. Ships produce not only waves but also a deep fall in water level during their passing. This article presents detailed discussion of these issues and a method of preservation of evidence for handling claims for damages so caused.

The constant extension of large ports means increasingly intensive use of existing infrastructure and available times for loading and unloading. The cruising speeds of ships are also on the increase thanks to propulsion techniques and pressure to maintain tight sailing schedules. Merchant shipping is concentrated more than ever on large container ships of about 300m length, as represented by the Post-Panmax ships. These water-displacing vessels in particular produce a deep downward draft of water level during fast travel. On the River Elbe ship speeds of approximately 20 knots, mostly overnight, are no rarity. The so caused sustained reduction, or 'draw-down', in water level of more than 0.4 metres and subsequent packets of secondary waves, often over 1.40m in amplitude, are not only dangerous to human beings, ships and buildings but frequently cause damage to riverbanks, moored ships and shore-side infrastructure.

Extreme Waves

Such damage and dangerous situ-ations arise from vessels sailing at a speed (and draught) too high for the situation, see Figures 2-4 for example recordings (source Storm Tide Network, Hamburg Port Authority and General Acoustics GmbH).

Characteristics

The WSA (Waterway Authority) Hamburg and the Franzius-Institute Hanover have carried out short-term wave measurements at various pos-itions on the River Elbe. The results and conclusions are frightening. The characteristics of these waves differ according to the design of the ship involved and its speed through the water, the distance of sailed track to measuring point and to the surface of the seabed (depth of water). See Figures 5, 6 and 7 for some typical examples, (source Flyer WSA Hamburg informiert: Gefährdung durch SOG und WELLENSCHLAG 2007).

The waves and changes in water level shown in Figures 8 and 9 were recorded on 20th February 2007 and 20th March 2007, respectively, by the acoustic wave measuring station LOG_aLevel in Hamburg-Nienstedten. This station is associated with the General Acoustics GmbH storm-tide-measuring network for the Hamburg Port Authority.

Figure 8 shows how the remarkable draw-down of approximately 1.3 minutes duration here exceeds the 0.4-metre mark. This long-lasting draw-down is capable of damaging river–banks and harbour facilities. Large quantities of water stream out of the harbour facilities by suction, leading to short-term sinking in water level. The following Figure 9 shows a typ–ical wave characteristic able to damage banks and other infrastructure facil–ities. After a decrease in water level in the port there arrives a secondary packet of waves, entering the basin at maximum amplitude of 1.2m and creating an enormous swell. However, the duration of a 1.3 minute draw-down and the magnitude of waves quoted previously still fail to represent extreme values (source: Storm Tide Network, Hamburg Port Authority and General Acoustics GmbH).

Damage

The balance for damage can very quickly accelerate to high levels. For the port operator, payment of insurance equity contributions may prove very painful. During extreme events losses may quickly exceed the fixed sum of insurance, especially when third-party property such as ships are damaged too. With repeated damage the insurer may demand an increase in monthly/yearly insurance premium outlay. It cannot be excluded that in future insurance companies may require preservation of evidence. This can be easily achieved using an acoustic LOG_aLevel tide and wave gauge from General Acoustics GmbH.

Legal Basis

Although speed limits are not stipulated along the River Elbe, ship's masters can be held liable for neglect of Paragraphs §3 and §26 of the German 'Seeschifffahrtstraßenordnung' (SeeSchStrO). This reads: 'In accordance with §3 SeeSchStrO, the ship's master has to consider precautionary rules which require the seaman's tradition or special circumstances of the case, i.e. to decelerate and sail slowly at some places if necessary, e.g. in front of ports or facilities needing protection. Further, according to §26 SeeSchStrO: '…vehicles have to decrease their speed in time as far as necessary in order to avoid endangerment by suction or wave impact, in particular when passing ports, penstocks and barriers (quote: Flyer WSA Hamburg informiert: Gefährdung durch SOG und WELLENSCHLAG 2007).

Costs-by-Cause

In order to recover costs for damage from those that cause it, preservation of evidence is necessary. This is possible with the help of the AIS recordings (automatic identification system) for ships with 1-minute-plots, and measurement of waves carrying extreme values, as

generated by large vessels passing at too high a speed. AIS recordings provide information about the time, ID of the ship, length, width, draught, destination and speed over ground, position and heading. Add–itionally, the exact track plot, and thus distance to the shore, is indicated. A wave and water-level recording device is used to collect this highly dynamic ship-wave data, as well as the drop in water levels. In January 2007 the German author-ities (Harbour Police) used Hamburg Port Authority LOG_aLevel wave data for the preservation of evidence for determinations in the case of a shipping accident on the River Elbe, and this data was also later used in court.

Wave Measurement

The storm-tide-measuring network in the Port of Hamburg consists of four perman-ent measuring stations at four locations: ‘Harburger Schleuse’, ‘Strandkai’, ‘Billwerder Sperrwerk’ and ‘Nienstedten’. These stations are equipped with LOG_aLevel acoustic wave measuring stations from General Acoustics. The systems work autonomously and independently, data transfer being done by means of GPRS to a dynamic IP address. The data is recorded on the office computer; measured wave curves being displayed via dedicated software in real time. The wave data is also stored in each station on the memory card of a data logger for further evaluation. One of the stations is equipped with a wind gauge. The measured wind data is conveyed along with standard wave data. The main objective of the network is to measure waves during storms at the second largest port inEurope.

Shipmasters and pilots, knowing the consequences of waves and falls in water level can be traced to the actual ship causing such phenomena, are extra motivated to navigate according to good seaman’s practise.