

# Process Safety Forum

Safety Alert #12 – Issued on 11/10/2017

## Site flooding event

*This safety alert is shared in order to promote learning and improve safety. You should seek appropriate guidance regarding the relevance, accuracy, and completeness of this alert to your circumstances prior to implementation.*

### Issue

A North Sea tidal surge partly flooded a regulated site. The site involved was a lower tier COMAH site storing and blending hazardous wastes (potentially flammable, toxic and dangerous to the environment). The issue and learning are equally relevant to any industrial site that has a potential flood risk.



Above - Picture of the damaged wave guard (photographed from the seaward side)



Left – Picture of the repaired wave guard (photographed with the site behind the camera)

The site was identified as being at 'high' risk from coastal flooding but was protected by a sea wall and wave guard.

The site is signed up to the Environment Agency flood warning service and regularly receives flood alerts for the site. A tidal surge on 13/1/17 resulted in significant wave overtopping and flooding of the site yard area to a depth of 10-15cm. This level of flooding was anticipated as part of the site Flood Risk Assessment, but was much more significant than the site normally experienced when flood alerts are issued. One section of the wave guard (situated between the site and the sea) collapsed but flooding and damage on site behind this section was no greater than in other areas. The site flood plan (based on EA Guidance- Preparing for flooding – a guide for sites regulated under EPR and COMAH (June 2015)

<https://www.gov.uk/government/publications/preparing-for-flooding-a-guide-for-regulated-sites>

was partially implemented but the consequences of this particular surge tide were more severe than the site anticipated and they did not fully implement all aspects of their flood plan. Actual site damage was minimal with no loss of containment or damage to bunds and tanks. Some empty stacked drums were toppled by wave actions and loose plastics were caught in the site fence.

### Learning

**Flood Plans** – The Environment Agency (EA) advises that companies should ensure that any site flood risk assessment fully captures the risk to people and the environment and that plans for Emergency Procedures are very specific as to when actions such as evacuation of the site are to be triggered. Such plans should be practiced so that trigger points for actions are checked and companies can be confident that sufficient time for action completion is allowed. Ensure there are




arrangements for a dynamic risk assessment in the event that there is a failure of a protective measure. As part of flood planning, the function and design of flood defence features needs to be confirmed and understood along with the effects and likelihood of failure. Questioning the construction, inspection and maintenance regimes relating to the relevant feature (in this case the wave guard) is therefore needed.

**Flood Warning** - The site expected the impact of the tidal surge to be similar to the impact they had experienced on other occasions when previous 'flood alerts' had been issued. As a result they did not fully implement their full flood plan. The site anticipated they would receive a 'flood warning' which is the next level of escalation from a 'flood alert' in the event it would be necessary to implement the full flood plan, however this is not necessarily the case. Companies should be aware that 'flood warnings' may not be available in their area even if flood alerts are issued. This was the case in this incident. The site has now developed a dynamic assessment tool to predict escalation from 'flood alert' status and are looking to work more closely with the local authority who have localised knowledge of how specific weather and sea conditions affect the impact of tidal surges in the area.

**Recommended action** for other sites in or near flood risk areas:

The EA has advised that companies should regularly check the flood warning service available to sites, they offer a free flood warning service in many areas at risk of flooding. The Flood Warning System (FWS) gives an advance warning by telephone, mobile, text message or email. All that is needed to register is a telephone number that the EA can use to send flood warnings to at any time of the day or night. **Due to current forecasting limitations however, the Flood Alert may be the only service available.** Find out if you can receive flood warnings for your area by calling Floodline, the EA 24-hour telephone information service, on 0845 988 1188 or going online at [www.environment-agency.gov.uk/flood](http://www.environment-agency.gov.uk/flood). If there is no flood warning service available for your area, then you need to have your own system in place for activating your flood plan. You can still register to receive other nearby flood warnings which will provide the next best service. For advice on which warning would be most suitable, operators should contact their local EA contact in the first instance. The following points should help to establish when to activate your plan:

- use local information and observations. You are the local experts;
- local authorities may have additional information that will be of use, especially in coastal areas where wind directions, wave heights and wave periods may result in localised impact of tidal surge events.

Online flood risk forecast	 <b>FLOOD ALERT</b>	 <b>FLOOD WARNING</b>	 <b>SEVERE FLOOD WARNING</b>	Warning no longer in force
<b>What it means</b> Be aware. Keep an eye on the weather situation.	<b>What it means</b> Flooding is possible. Be prepared.	<b>What it means</b> Flooding is expected. Immediate action required.	<b>What it means</b> Severe flooding. Danger to life.	<b>What it means</b> No further flooding is currently expected in your area.
<b>When it's used</b> Forecasts of flooding on our website are updated at least once a day.	<b>When it's used</b> Two hours to two days in advance of flooding.	<b>When it's used</b> Half an hour to one day in advance of flooding.	<b>When it's used</b> When flooding poses a significant threat to life.	<b>When it's used</b> When river or sea conditions begin to return to normal.

*The Process Safety Forum has been set up to provide an industry association platform whereby initiatives, best practice, lessons from incidents and process safety strategy can be distilled and shared across sectors, to influence our stakeholders (including the Regulators), and to drive the process safety management agenda. The Process Safety Forum consists of representatives from UKPIA, TSA, CIA, OGUK, CBA, RSSB, ENA, ECIA, UKLPG, BAMA, EIG, UKOPA, SWA, SDF, and MPA.*

The website is [www.p-s-f.org.uk](http://www.p-s-f.org.uk). For further details contact: [PSF.Secretary@gmail.com](mailto:PSF.Secretary@gmail.com).