Basic Details

Publish Date

02 September 2025

Case ID#

3117

Title

Ulley Spillway Incident

Nation

England

Regulator Reference No.

307

Legal Status

Statutory

Reservoir Type

Impounding

Reservoir Capacity

10 - 24,999m3

Year of Construction

1850 - 1899

Main Construction Type

Earth fill embankment

Dam Height

10 - 14.99 metres

Dam Flood Category

A

Hazard Class

High-risk reservoir

Reservoir Use

- Other

Owner Type

Public body

Incident Details

Date & Time of Incident

25 June 2007 - 12:00

Date Incident Closed

Observations that Caused the Incident to be Declared

- Deformation or instability of embankment or dam wall (slumps, cracks, depressions, etc.)
- Slope or face deformation (slippage, cracking, slumps, mounds, depressions)
- Water flowing outside of engineered channels

Describe the Incident

The dam had a masonry spillway channel at the toe of the embankment. Following heavy rainfall, a large volume of water flowed down the spillway channel. It is believed that turbulent water overflowed the spillway walls and also plucked masonry blocks out of the wall. This led to the spillway walls collapsing, which exposed the downstream face of the dam to erosion. As a result of existing fluvial flooding and the threat from the reservoir, many people living downstream were evacuated and major roads, such as the M1, were closed. The Fire Service used their high volume pumps to draw down the reservoir and temporary repairs were made. Refer to Bulletin No.1 for more details.

Supporting Photos

Causes and Impacts

Natural Processes which Initiated or Contributed to the Incident

Main Contributing Factors to the Incident Occurring

Dam Factors

- Instability

External Factors

- None

Shortcomings

- Design shortcoming

Root Cause of the Incident

Impacts on the Reservoir

- Spillway or overflow - failure or instability
- External erosion

Supporting Photos

Supporting Contributions and Studies

Human Factors which Influenced the Incident

Instrumentation at the Reservoir

The incident was one that could not be anticipated by instrumentation. There are crest pins which are levelled annually. Readings taken after the event showed marginal change and the conclusion is the crest was unaffected by the incident.

Was Instrumentation Effective?

Not Applicable

Assistance by External Parties and Impacts on Downstream Population

The Country Park manager contacted the police. The police declared an emergency at about 10pm. The fire brigades from around England and Wales brought a total of thirteen high volume pumps (HVP). These were used, initially, to reduce the water level back down to the normal operational top water level (NOTWL) and then to reduce to 1m below NOTWL. On Wednesday 27th June, the HVP's were replaced by commercial pumps. The public and press were interested and wanted to have a look. The incident is in effect a construction site (multiple hazards normally associated with construction sites plus deep water, fast running water and darkness). An off-site press office was needed to field questions and provide escorts for visitors when the situation is safe. A member of the public expressed concern about the lack of an emergency telephone number at the reservoir. Given the flooding in the middle of the nearby city, it would not have helped to have a telephone number. A solution is to ensure that in the emergency plan, the police have contact numbers and that the public are encouraged to dial 999. It means the lines of communication are kept simple without overlap.

Summary of Studies or Investigations Undertaken

The problem of the erosion at the end of the spillway is not possible to investigate in detail because the masonry walls on the embankment side of the spillway were completely destroyed and since then the area has been covered with granular fill. As a result of the incident, the Supervising Engineer has recommended that a Section 10 Inspection be undertaken. This will include a number of studies.

Lessons Learnt

Lesson 1

- General design and construction

Floods should be able to be directed not just over the weir and along the spillway but away from the toe of the embankment.

Lesson 2

- Structural

Where a channel is lined using masonry walls, what is the integrity of the masonry wall. If the flow gets out of the channel will the walls collapse leading to further erosion or will they stay upright and limit any erosion. The walls need to act monolithically which means that different skins of masonry need to be tied together. Also, any voids need to be filled to stop water getting into the masonry and pressurising the voids. There are examples from the incident of jets of water issuing from the walls and of individual masonry units being plucked out of the walls.

Lesson 3

- Structural

Where there is a change in gradient from steep to shallow, are the spillway walls on the embankment side high enough to direct the flow away from the embankment even if this causes erosion away from the embankment.

Closing Comments

Supporting Photos

Information provided has been sent from reservoir owners and engineers, and cleansed of personal information by the enforcement authority. We cannot guarantee the accuracy of the data, but if you find an error please contact the relevant enforcement authority.