Accident / Incident Investigation Case Study

Accident Summary

On Wednesday 23 May 1984, a group of 44 people was assembled in a valve house set into a hillside at the outfall end of the Lune/Wyre Transfer Scheme at Abbeystead. The visitors were attending a presentation to allay anxieties on the effects of the installation on the winter flooding of the lower Wyre Valley.

As part of this presentation, water was to be pumped over the weir regulating the flow of water into the Wyre. Shortly after pumping commenced there was an intense flash, followed immediately by an explosion causing severe damage to the valve house.

Sixteen people were killed; no one escaped without injury from the valve house.

The explosion was caused by the ignition of a mixture of methane and air, which had accumulated in the valve house. The methane had been displaced from a void, which had formed in the end of the Wyresdale Tunnel during a period of 17 days before the explosion when no water was pumped through the system.

No source of ignition for the explosion has been positively identified. Thorough examination and testing of the electrical equipment has not revealed any faults likely to have caused ignition and there is insufficient evidence to confirm any of the other explanations which have been considered. Smoking in the Valve House was not prohibited because the likelihood of a flammable atmosphere arising there had not been envisaged.

Failings in technical measures

- The possibility of a methane rich environment had not been recognised. The fact that large quantities of methane might be dissolved in water, which subsequently leaked into the system, was not considered by those involved with the design/operation of the system. A system designed for discharging water open to the atmosphere would have prevented an explosion.
- Design Codes - Plant: ventilation of flammable gases
- Leak / Gas Detection: Positioning of detectors

- The operation of the plant was not in accordance with the operating manual provided by the designers of the systems. Changes in the operating procedures had taken place without proper consultation as to their impact.
- Operating Procedures: human factors
- Operators were not fully aware of the significance of special features of the pumping installation.
- Training: Operator training, competence testing