

Hazardous materials containment – why routine inspections are essential for minimising environmental risk

This article discusses secondary and tertiary containment systems for hazardous liquids, highlighting why regular auditing and inspection is vital to minimise the potential effects of major incidents and pollution events.

Major incidents and numerous pollution events over the years have highlighted deficiencies in the way hazardous liquids are stored and the harm such incidents can cause to the environment, people, and property.

Secondary and tertiary containment systems are installed on sites to prevent substances from escaping into the environment and causing a major accident or pollution incident and provide greater control in the management of associated hazards. The types of secondary and tertiary containment that can be used include bunds, integral containment, buildings, interceptors, catchment tanks, or barriers such as penstock valves.

Site owners and operators are required to prevent the escape of potentially polluting liquids into the environment. Failure to provide and maintain effective containment measures can result in enforcement action, financial penalties, and personal liability of company Directors.

Relevant good practice guidance such as CIRIA C736 and the Landfill ICoP on containment all recommend periodic inspection, gap analysis and improvement programmes for existing containment systems. Undertaking inspections and actioning their recommendations can result in owners and operators avoiding the need to construct expensive, new, large-scale infrastructure by improving and maintaining facilities that are already in place.

It is also expected that the Environment Agency are to formalise draft guidance for 'Appropriate measures for the biological treatment of waste' which will require a chartered or structural engineer to validate the secondary and tertiary containment systems for biological waste sites.

The importance of regular inspection and maintenance plans

Over the operating life, plant, equipment, and structures may exhibit signs of ageing, which can compromise safety and reliability. Knowing what, when, where and how they should be inspected and maintained is therefore essential for maintaining safe and compliant operations. Effective maintenance requires the right task to be done correctly at the right time, each and every time, so it's important that competent people are responsible for this.

Physical inspections are a key tool to maintain containment integrity and undertaking regular inspections can detect any signs of potential or existing leaks, cracks and corrosion etc.

The Control of Major Accident Hazards Regulations (COMAH), the Environmental Permitting Regulations (EPR),

and Appropriate Measures for the Biological Treatment of Waste in England require sites to ensure that adequate inspection and maintenance procedures are in place, along with a testing regime, and that any defects are managed in an appropriate way.

The CIRIA C736 guidance recommends that assets should be uniquely identified on an asset register, which provides a basis for inspection and maintenance planning programmes. Feasible plans and schedules should be developed to execute those programmes and should be approved by specific named competent people.

Process risks, and loss of containment scenarios in particular, should be identified via installation specific hazard studies. These should be carried out in accordance with recognised standards or codes of practice, and include, but not be limited to, such studies as hazard identification (e.g. HAZOP, HAZID), functional safety assessment, layers of protection analysis etc.

Gap analysis

By undertaking a gap analysis of existing installations against legislation and recommended good practice, shortcomings can be identified which will inform any necessary improvement plans. Where practicable, these shortcomings should be addressed. However, if it is not considered practical then alternative measures should be implemented such as tertiary containment to reduce the risk sufficiently to satisfy the law.

It is essential that all duty holders understand the risks that can be posed to people and the environment, both within and external to the establishment boundary. With fewer new containment facilities being built in recent years, it is important to have established inspection, maintenance and upgrading plans in place to maintain the integrity of existing facilities to continue to meet any minimum legislative or regulatory requirements.

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