

National Dam Safety Awareness Day Highlights Vital Measures to Prevent Dam Failures

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Surrey, United Kingdom Aug 19, 2023 ([Issuewire.com](https://www.issuewire.com)) - To commemorate National Dam Safety Awareness Day, the [U.S. Department of Labour Blog](#), in a recent report, has shed light on the critical significance of dam safety and the imperative to avert potential failures. Dams serve as integral components of various industries, including providing flood control, water storage for mining activities, and runoff management. However, the repercussions of dam breaches can be catastrophic, resulting in property damage, loss of life, and environmental devastation, the report says.

According to the report, National Dam Safety Awareness Day traces its origin back to the disastrous South Fork Dam failure. The incident occurred 134 years ago near Johnstown, Pennsylvania. On May 31, 1889, the dam collapsed, releasing around 20,000,000 tons of water. The aftermath witnessed more than 2,200 lives lost, rendering it the most devastating dam collapse in the country's history.

Between 1848 and 2017, there were an average of 10 dam failures that occurred annually, the report claimed. Often, these involved smaller dams that induced flooding but yielded no fatalities.

As mentioned earlier, dams are needed for mining activities. However, a lack of properly executed geotechnical monitoring before and after dam construction can pose potential risks. The Buffalo Creek Mine Disaster in 1972 acts as a stark reminder of these dangers. Three coal waste impoundment dams in West Virginia failed, releasing millions of gallons of water and coal slurry onto 15 downstream communities. The catastrophe led to the death of 125 people and obliterated around 500 houses.

In response to such tragedies, comprehensive federal dam safety programs were established. The legacy of such incidents has contributed to protecting the lives and livelihoods of individuals living downstream of dams. The US Bureau of Mines, now the Mine Safety and Health Administration (MSHA), introduced stringent regulations for the coal industry. These regulations mandate that dams be designed, constructed, and subjected to inspections by both the company and MSHA personnel to validate their safety.

The causes leading to dam breaches are commonly rooted in water flowing over the dam's crest or water eroding the dam from within. Underscoring dam safety as an ongoing process, the report emphasises ensuring diligent geotechnical monitoring, periodic risk assessments, and timely maintenance or upgrades for preventing dam failures. The Buffalo Creek Mine Disaster highlighted the dire consequences of inadequate design, construction, and inspection practices.

As such, geotechnical monitoring emerges as a proactive and essential strategy to mitigate the risks associated with dam failures, thus enhancing overall dam safety. It involves the continuous assessment of a dam's structural integrity, stability, and environmental conditions. The advanced sensors, instruments, and data analysis techniques used in geotechnical monitoring enable operators to diligently assess ground movement, water levels, seepage, natural or induced seismicity, and material properties. This real-time monitoring provides valuable insights into the dam's behaviour and enables early warnings of impending issues.

This proactive approach enables swift interventions and crucial maintenance. It ultimately enhances dam safety whilst minimising risks to surrounding communities and ecosystems. Dam operators looking to mitigate risks, and augment their decision-making are urged to invest in integrated [distributed sensing-based](#) geotechnical monitoring solutions such as [Silixa](#). High-end distributed acoustic (DAS), temperature (DTS), and strain (DSS) sensing techniques offer a reliable solution to dam monitoring resulting in cost-savings and regulatory compliance.

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