Identifying Leakage Paths in Earthen Embankments

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SYNOPSIS. The leakage of water from a dam suggests a number of possible scenarios, and none of them are good. At best, the reservoir owner is losing the power-generating potential of the escaping water. At worst, the leakage may be the precursor of dam failure. Among the technological advances that will enhance the safety and efficiency of hydropower in the future, is a remarkable breakthrough in the area of seepage diagnosis and remediation.

Researchers, working under the auspices of Willowstick Technologies, have developed a system that has been proven to reduce significantly both the time and the expense associated with seepage diagnosis. It thus represents a major step forward in dam safety.

In the new procedure, electrodes are placed strategically upstream and downstream of the dam structure, and the water between them is charged with a low voltage, low amperage, and audio-frequency electrical current. The current creates a distinctive magnetic field that represents the location and character of the water flow occurring between the electrodes. This field can be identified and surveyed from the surface using a specially tuned magnetic receiver. Through this technique and hardware, investigative teams have accurately diagnosed seepage problems in locations throughout the United States and Canada and in the United Kingdom.

Improvements in reservoir construction, operation and maintenance . Thomas Telford, London, 2006