



Even Small Site Changes Can Risk Flood Safety For Nuclear Power Plants

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HOLDEN, MASSACHUSETTS, USA, April 24, 2015 /EINPresswire.com/ -- After Japan's Fukushima Dai-Ichi accident, there has been increased awareness and regulatory scrutiny regarding flood protection for U.S. nuclear power facilities. Yet one of the most important lessons learned from recent flooding hazard re-evaluations is that for reasons of security, modernization or convenience, important flood protection mechanisms and infrastructure are often ignored or undermined.

In the years since most U.S. plants were constructed and initially licensed, many site modifications have been made, ones that could compromise flood safety. As plants across the country address the U.S. Nuclear Regulatory Commission's 50.54(f) Letter and recommendations of the Near-Term Task Force, experts at [Alden](#) Research Laboratory (Alden) recommend looking at several potential trouble spots:

Site Grading and Topography.

Ideal site grading is designed to elevate the plant's protected area and drain stormwater surface runoff away from critical locations, but site grading can change with time and ideal is not always possible. To keep flooding protection intact, all re-grading or changes in topography must be reviewed by flooding experts. For example, if a storm drain is no longer at a low point after a grading modification, that drain will no longer perform as designed.

On-Site Storage and Temporary Buildings.

Placement of any structure— whether temporary or permanent— that may redirect water during a major rain event can have significant implications for flood safety. For example, at one plant, Alden observed box containers placed over a storm drain, which would have prevented the drain from operating properly during a rain or flood event.

Security Barriers. Security additions may change drainage flow. In addition, conservative flooding analysis modeling approaches require that drainage openings be assumed as partially or entirely blocked by debris. Developing a hierarchical hazard analysis in an effort to reduce this conservatism can be costly. When designing and citing new security barriers, such as bullet-resistant enclosures, vehicle and delay barriers, storm drain security mesh or grates, placement should be carefully coordinated between security personnel and flooding experts.

Internal Communication.

Communication between engineering staff and in-house or contracted flood experts can be lacking. Without specialized hydraulics and hydrology knowledge, generalist engineering staff should not be expected to make educated decisions about how ongoing site modifications or changes in use impact specialized flood protection systems. To ensure safe operation, communication is critical and plant protocol should involve flood protection specialists in all modifications.

About Alden

Alden (Alden Research Laboratory, Inc.) is an internationally acclaimed leader in solving flow-related engineering and environmental problems. Alden has evaluated storm-related threats for the U.S. Nuclear Regulatory Commission's requested post-Fukushima flooding hazard re-evaluation. Over more than a century, Alden has provided engineering, field and laboratory technical assessments for all types of power generation facilities and associated regulatory agencies. With laboratories in Massachusetts and Washington and offices across the country, Alden provides energy licensing, compliance, environmental services, physical and computational flow modeling, flow meter calibration, and field services. Founded in 1894, Alden is the longest continuously operating hydraulic laboratory in the United States.

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