

**Supporting document and additional examples for Information Notice 2012-01:
SEISMIC CONSIDERATIONS - PRINCIPALLY ISSUES INVOLVING TANKS AGENCYWIDE
DOCUMENTS AND MANAGEMENT SYSTEM Accession No. [ML11292A175](#)**

This document supports information notice (IN) issued to inform addressees of recent operating experience related to several seismic considerations. Particularly seismic concerns related to Standby Liquid Control (SLC) system test tanks (and similarly elevated tanks) and additional seismic issues identified related to Refueling Water Storage Tanks piping alignments tied to non-seismic systems that were recently documented in NRC inspection reports and in Licensee Event Reports (LERs) or Event Notifications (ENs). The NRC expects recipients to review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. The suggestions that appear in this document are not NRC requirements; therefore, no specific action or written response is required.

Standby Liquid Control Tank Issues – Additional Examples

Operating experience related to these seismic qualifications of Standby Liquid Control (SBLC) system test tank issues (and potentially other similarly elevated tanks) are discussed below:

Duane Arnold

On November 10, 2010, as part of an Operating Experience review of the LaSalle SBLC test tank issue, Duane Arnold engineering staff identified that the SBLC test tank was also maintained partially filled (in accordance with surveillance test procedures) and therefore, would not meet the design basis seismic loads. The SBLC was drained of water on November 11, and the applicable procedures were revised to ensure that the tank was drained when the SBLC system was required to be operable.

The cause was determined to be a latent design issue occurring during original construction. Specifically, the plant was licensed prior to the issuance of NRC Safety Guide #29, which was issued in June 1972. During the implementation of this guide, the licensee failed to re-design the SBLC system (specifically the test tank) such that the seismic requirements were maintained prior to the initial plant start up.

Additional information on the Duane Arnold issue appears in Duane Arnold Energy Center Licensee Event Report 50-331/2010-006, dated January 7, 2011, in ADAMS Accession No. [ML110070763](#).

Additional seismic concerns have been identified related to connecting Refueling Water Storage Tanks piping to non-seismic non-safety related systems that were recently documented in an NRC inspection report, a License Event Report (LER), and an Event Notification report per 10 CFR 50.72 that are discussed in the following sections. Other similar non-seismic/seismic system inter-connections may also need to be considered.

San Onofre

NRC staff noted that San Onofre Units 2 and 3 issued an LER 10-005-00, regarding “Refueling Water Storage Tank Alignment to Non-Seismic Piping Results in Potential Loss of Safety Function” on December 10, 2010 that is available in ADAMS at Accession No. [ML103480104](#).

Per the LER, the causes of this event include past weaknesses in the processes for revising procedures and drawings, and performing design changes; and inadequate understanding, assessment, and documentation of the impact of the Spent Fuel Pool (SFP) Cooling and Cleanup System alignment changes on licensing and design basis requirements during the time period from 1982 through 1995. In addition, ineffective review of related industry operating experience since 1996 may have delayed discovery of the deficiencies. Licensee corrective actions include Units 2 and 3 isolation of manual normally locked-closed isolation valve (MU060). MU060 is on the Safety Injection Tank drain line to the RWST. Also the suction of the SFP makeup pump (MP011) via isolation valve (MU070) was administratively controlled in the closed position. Long term corrective actions include evaluation of various options for properly aligning the RWST for recirculation or purification activities.

Robinson

The staff noted a Licensee Event Report was issued for Robinson Unit 2 – “Condition Prohibited by Technical Specifications When Non-Seismic System was Aligned to Refueling Storage Tank due to Regulatory Requirements Not Adequately Incorporated in Plant Documentation ADAMS Accession No. [ML11192A016](#)) that is similar to the Harris and San Onofre issues.

The Robinson licensee investigation concluded that the regulatory requirements for the separation of seismically qualified and non-qualified systems, structures, and components were not adequately incorporated into the Design Basis Document and Updated Final Safety Analysis Report (UFSAR).

Licensee completed corrective actions included administrative controls put in place to provide guidance for Operations on alignment restrictions for piping that could affect the operability of the RWST. Licensee planned corrective actions included applicable Operations procedures will be revised to restrict alignment of the refueling water purification loop to periods when RWST operability is not required. Applicable sections of the UFSAR and Design Basis Documentation will be revised to include restrictions on the operating modes when the purification loop is allowed to be used to purify the RWST.

North Anna

The staff noted a Licensee Event Report was also issued for North Anna site - [LER 11-002-00 for North Anna, Units 1 and 2, Regarding Condition Prohibited by Technical Specifications When a Non-Seismic System was Aligned to a Seismic System, \(ADAMS Accession No. ML11249A052\)](#).

The licensee concluded the direct cause of this event was incorrect application of the use of compensatory measures, i.e. manual operator actions, when placing the non-seismic Refueling Purification (RP) system in service on seismically qualified systems/components (RWST) during modes of operation when they are needed to perform their safety function. Manual operator actions had been evaluated and deemed acceptable in accordance with processes and procedures in place at that time. However, recently it has been determined that licensees cannot use compensatory measures when compromising the seismic qualification of a system/component.

The licensee corrective actions included: Operating procedures associated with placing the non-seismic RP system in service on seismic systems were suspended. The UFSAR will be updated to reflect current operating practices. An assignment has been created in the Corrective Action System to evaluate the extent of condition. Additional corrective actions being considered include evaluating what is required to qualify the RP system as seismic and revising operating procedures to allow operation of the RP system on the RWST in Modes 5, 6 and defueled.

Callaway

The NRC staff also noted an event notification ([EN report #46715](#), dated 3/31/2011) from Callaway describing an "UNANALYZED CONDITION IDENTIFIED FOR INOPERABLE RWST LEVEL" that relates to non-safety piping and potential seismic events. This event was later retracted on May 26, 2011 based on subsequent licensee analysis. However, even though this EN was retracted it may still provide information of instructive value for other licensees to consider related to non-safety piping and analysis for high energy line breaks (HELBs) and the barriers necessary for protection against events (such as following a seismic event). See [EN report #46715](#) and associated retraction that is available on the NRC public web page at: <http://www.nrc.gov/reading-rm/doc-collections/event-status/event/2011/20110527en.html#en46715>

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This document supports Information Notice 2011-XX SEISMIC CONSIDERATIONS - PRINCIPALLY ISSUES INVOLVING TANKS available in ADAMS Accession No. [ML11292A175](#). See this Information Notice for more details, background information and discussion.

Note: NRC generic communications may be found on the NRC public Web site, <http://www.nrc.gov>, under NRC Library / Document Collections/ Generic Communications.