

2011

U.S. Nuclear Power Industry

Emergency Classification Notifications

Statistics, Trends & Operating Experience



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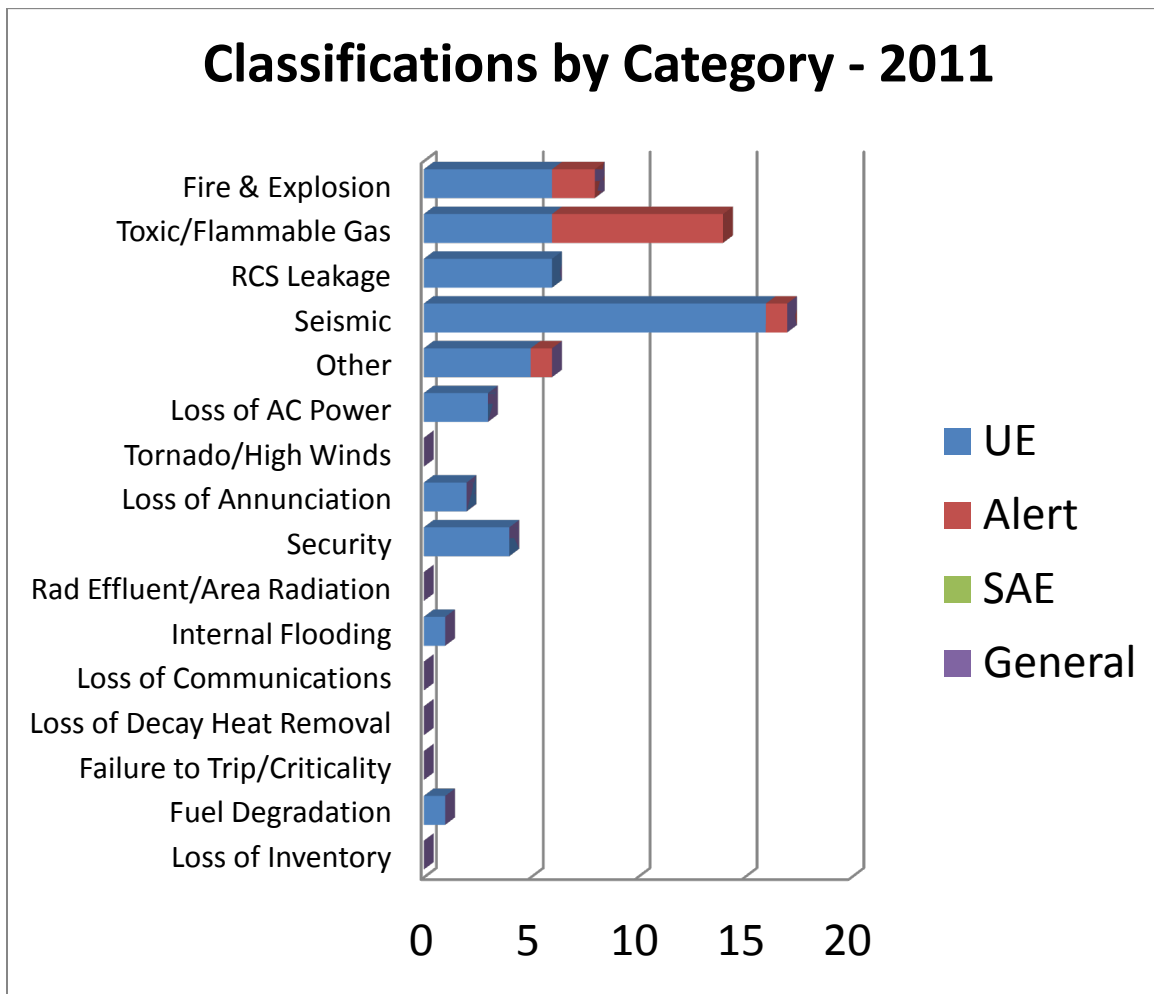
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STATISTICS & TRENDS

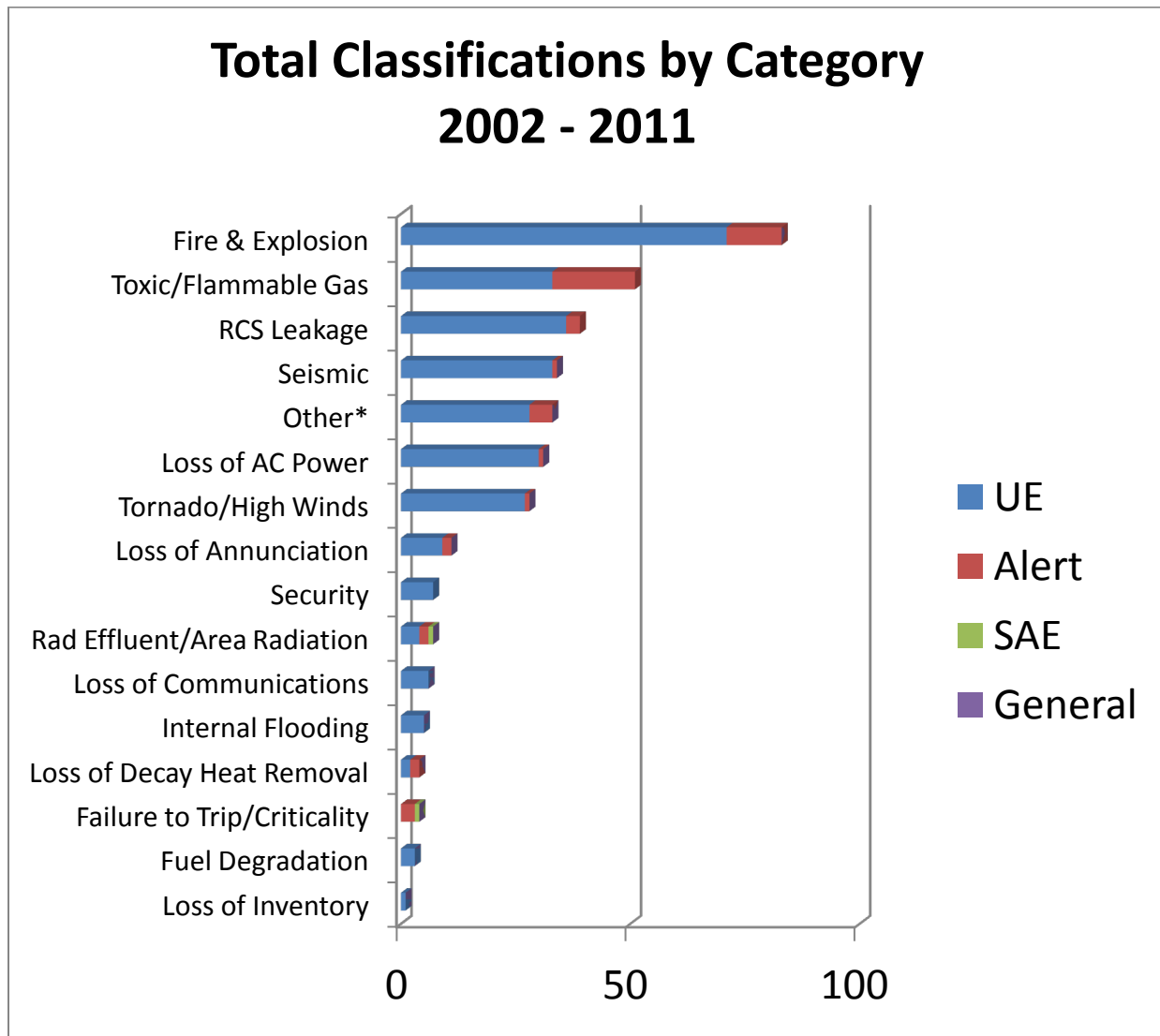
During 2011 there were fifty (50) Unusual Events and twelve (12) Alert emergency classification notifications made to the NRC. **Figure 1** depicts the 2011 emergency classification notifications by category. These categories represent those for which at least one emergency classification has been made over the ten year period of 2002 through 2011. **Figure 2** depicts total emergency classifications made by category over the period of 2002 through 2011¹. The distribution of emergency classifications for the year 2011 is notably divergent from the cumulative totals, by category, over the ten year period shown in Figure 2. This divergence is mostly attributable to the east coast seismic event on August 23rd and an unusually high number of toxic/flammable gas related events. The Tornado/High Winds category tends to be dominant only in years with significant hurricane activity - 2011 was, like 2010 and 2009, not an active year.

Figure 1



¹ All data compiled from the [Nuclear Regulatory Commission Event Report website](#)

Figure 2



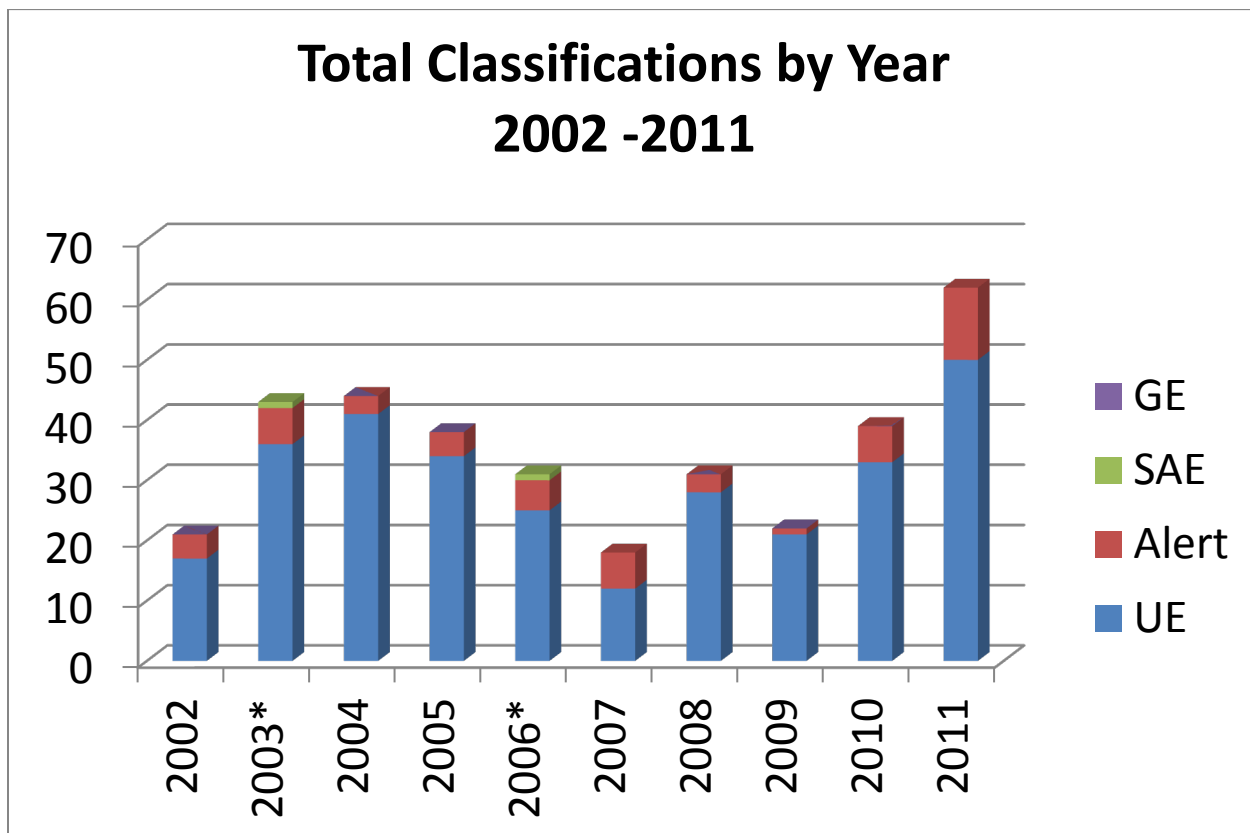
* The **Other** category includes reported events such as: high (external flooding) and low ultimate heat sink/intake levels (HU1.5), Containment operability issues, fuel handling incidents and Emergency Director judgment.

2011 Emergency Classification Notifications

Figure 3 depicts total emergency classifications reported to the Nuclear Regulatory Commission per year for the years 2002 through 2011. 2011 presented the greatest number of emergency classification notifications for the years we have analyzed starting in 2001. Spikes in annual classification notifications have historically been the result of wide spread events such as electrical grid blackouts (2003), unusually high hurricane activity (2004 & 2005) and in the case of 2011, a major seismic event on the American east coast. However, even taking the seismic event related classifications (16 Unusual Events and 1 Alert) into account, 2011 presented the highest number of event classification notifications since 2004, a spike year due to hurricane activity.

Taking the event-specific spikes into account, 2011 was a significantly above average year for emergency classification notifications. 2011 also saw the highest number of Alert classification notifications on record.

Figure 3



* Two (2) Site Area Emergencies were declared during the analyzed 10-year period; 2003 Honeywell International UF6 release ([40405](#)) and 2006 LaSalle scram failure ([42348](#)).

INSIGHTS

After-the-Fact Classifications

In 2011 there were three (3) after-the-fact classifications. After-the-fact classifications continue to be dominated by RCS leakage IC SU5 with two (2) in 2011, two (2) in 2010, two (2) in 2009, two (2) in 2008, two (2) in 2006 and one (1) in 2005. The SU5 RCS leakage UE threshold guidance does not include a timing component (e.g., 15 min.). When it is later determined that short-term leak rates above the EAL threshold occurred, the licensee is obligated to acknowledge the classification. There was one (1) loss of annunciators after-the-fact classification. There was also one (1) hazardous gas related after-the-fact 10CFR50.72 notification based on a low oxygen concentration condition in containment that was discovered 45 days after the fact. This notification was not credited in the event statistics [47077].

Classification Retractions

The 2011 statistics include three (3) classification retractions. These are classified events that were later determined to have been either inaccurate or over classified. One (1) retraction was an Unusual Event classifications based on RCS leakage (SU5) that was later determined to not be classifiable. As noted in previous reports, a recurring issue is assessing what actually constitutes RCS leakage, specifically PWR intersystem Chemical Volume Control System (CVCS) leakage. [46625]

8/23/10 Seismic Event

At 1351 EDT on August 23rd, 2011 a magnitude 5.8 earthquake occurred. The epicenter was located 37.936°N longitude, 77.933°W latitude which is approximately 5 miles southwest of Mineral, VA. Due to the magnitude of the seismic event and the geological characteristics of the eastern US, the event was felt and/or detected over a very wide, if not symmetrical, area, **Figure 4**. The variability of detection and classification as a function of distance from the epicenter is likely due to geological phenomena as well as differences in seismic instrumentation sensitivity/setpoints and site-specific Emergency Action Level threshold criteria.

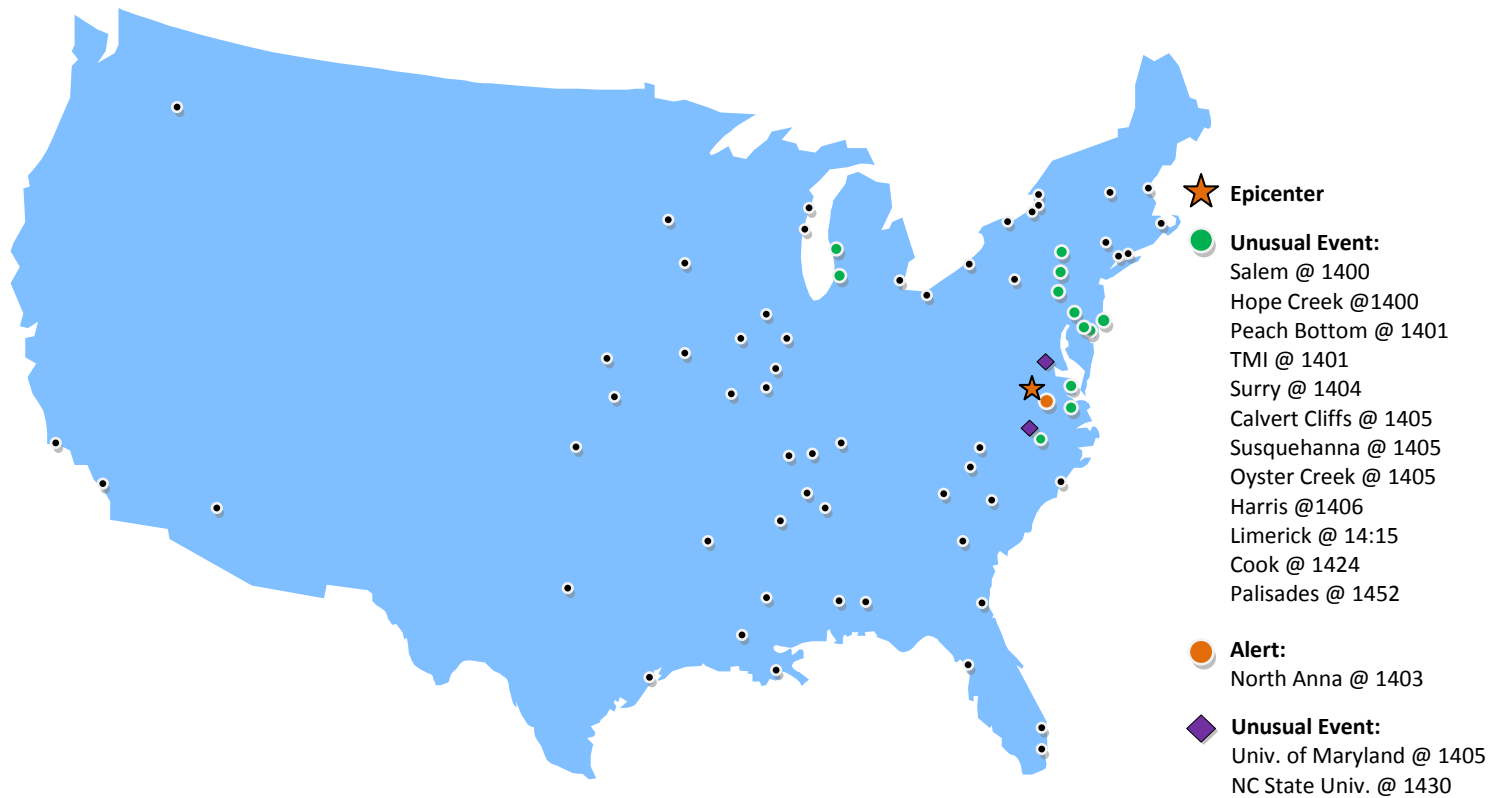
The initial seismic event resulted in the declaration of fourteen (14) Unusual Events, two (2) of which were declared at research reactors (Univ. of MD and NC State Univ.). North Anna Power Station declared an Alert based on Emergency Director judgment due to indications that significant seismic activity caused a loss of offsite power (LOOP). It would be subsequently determined that the station experienced ground accelerations greater than the Design Basis Earthquake (DBE). This was the first instance of an operating US reactor to have exceeded design limits for ground acceleration.

North Anna subsequently declared an Unusual Event on 8/25/11 and again on 9/1/10 due to after-shocks.

On November 11, 2011 the NRC approved the restart of both North Anna reactors.

Figure 4

August 23rd, 2011 Earthquake Event Classifications



2011 Emergency Classification Notifications

(Re)Focus Area: Toxic/Flammable Gases

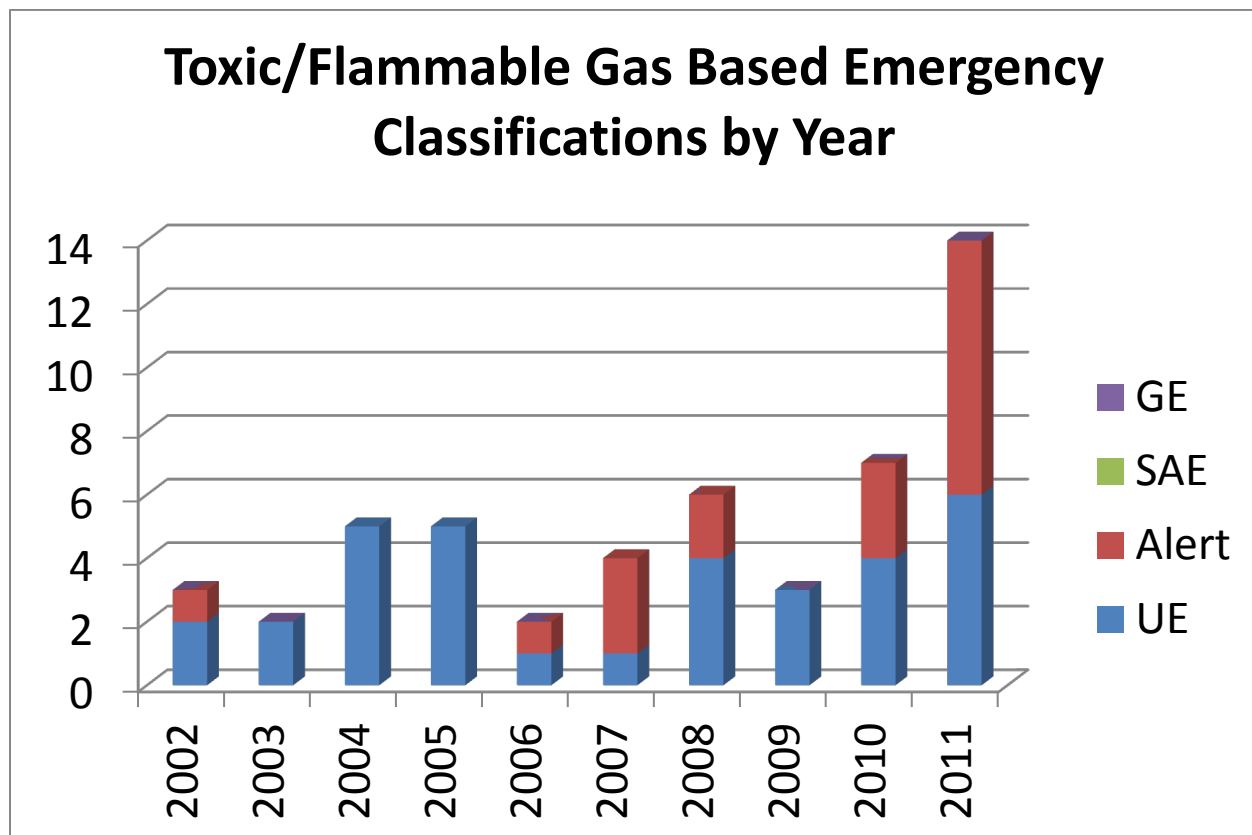
Once again this year's report focus area is toxic/flammable gas events.

Figure 5 depicts toxic/flammable gas based emergency classifications reported to the Nuclear Regulatory Commission per year for the years 2002 through 2011. 2011 saw a total of fourteen (14) classification notifications related to hazardous gases, six (6) Unusual Events and eight (8) Alerts. That is double the number of hazardous gas related events declared in 2010, and nearly three (3) times the annual average over the 10-year assessment period (~5/yr.).

As of the end of 2010 toxic/flammable gas events represented 13% of all classification notifications over the previous 10 year period and 26% of all Alert classifications over the same period. These percentages have risen to 15% and 36% respectively for the 2002-2011 period.

Of the 14 toxic/flammable gas classifications two (2) were related to inadvertent actuation of fire suppression systems (Halon), three (3) from hydrogen gas leaks, three (3) from smoke/CO₂ due to fires and the remaining six (6) from hazardous gas leaks and chemical spills (ammonia, Freon, sodium hypochlorite, etc.).

Figure 5



2011 Classification Notification Summaries By Category

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Classification Summaries By Category

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Event numbers are hyperlinked to the [NRC Event Report website](#).

SEISMIC (NEI 99-01 IC HU1)

8/23/11 UNUSUAL EVENT - EARTHQUAKE FELT ON SITE

University of Maryland ([47180](#))

The licensee declared a Notification of Unusual Event due to seismic activity. The reactor was not operating at the time of the earthquake. A facility walkdown was performed. The licensee subsequently exited the NOUE.

8/23/11 ALERT - EARTHQUAKE AND A LOSS OF OFFSITE POWER

North Anna Power Station ([47181](#))

At 1403 hrs. EDT, North Anna Power Station (NAPS) declared an Alert due to significant seismic activity onsite. The Alert was declared under NAPS EAL HA6.1 (NEI IC HA6). Both units experienced automatic reactor trips from 100% power and were stable in Mode 3. All offsite electrical power to the site was lost. All four (2 per reactor) emergency diesel generators (EDG) automatically started and loaded and provided power to the emergency buses.

While operating, the 2H EDG developed a coolant leak and was shutdown. As a result, the licensee added EAL SA1.1 (NEI IC SA5) to their declaration.

All control rods inserted into the core. Decay heat was being removed via the steam dumps to atmosphere. No personnel injuries were reported.

At 1116 on 8/24/11 the licensee subsequently downgraded the Alert to a Notification of Unusual Event based on equipment alignments and inspection results.

At 1315 on 8/24/11 the licensee exited the Notification of Unusual Event. The exit criteria was that all inspections and walkdowns were completed and plant conditions no longer meet the criteria for a NOUE.

A subsequent notification reported new information identified post event that a condition existed which met the emergency plan criteria but was not declared. On August 23 at 1403 EDT, North Anna Power Station declared an Alert due to seismic activity onsite. The Alert was declared under EAL HA6.1 (NEI IC HA6) "Other conditions existing which in the judgment of the SM warrant declaration of an alert. Initial

review of seismic response data from the earthquake on 8/23/11 (1348 hours) indicates that design spectrum input assumptions (i.e. Design Basis Earthquake [DBE] limits) may have been exceeded above 5 HZ. This would have resulted in classification of an Alert under EAL HA1.1 (NEI IC HA1).

[Note: For the purpose of report statistics the North Anna Alert was counted only in the Seismic Event category and not the Loss of AC Power or Other categories]

No significant equipment damage to safety related systems (including class I structures) was identified through site walk-downs nor was any equipment degradation detected through plant performance and surveillance testing following the earthquake.

8/23/11 UNUSUAL EVENT - SEISMIC EVENT

North Carolina State University ([47182](#))

The licensee declared a Notification of Unusual Event due to seismic activity. Equipment walkdowns performed. The licensee also terminated the event at the time of notification.

8/23/10 UNUSUAL EVENT - SEISMIC EVENT

Peach Bottom Atomic Power Station ([47183](#))

PBAPS [Peach Bottom Atomic Power Station] Units 2 and 3 experienced a seismic event which was felt in the control room in conjunction with a seismic trigger alarm set a 0.01G acceleration. The operating basis earthquake alarm of 0.05G was not received. Both units continued to operate at pre-event levels. There was no indication of damage at the site. Initial plant walkdowns indicated no plant damage as walkdowns continued.

At 1750 hrs. EDT, Peach Bottom terminated the Unusual Event that was declared at 1401 due to a seismic event that occurred at the station. Both Unit 2 and 3 operational walk downs of the site were completed. There were issues related to the seismic event which would impact continued safe operation of either unit

8/23/11 UNUSUAL EVENT - SEISMIC EVENT

Calvert Cliffs Nuclear Power Plant ([47184](#))

At 1354, the Calvert Cliffs Nuclear Plant (CCNPP) felt seismic activity in the control room. Both Unit 1 and Unit 2 maintained full power operations. At 1405 CCNPP declared an Unusual Event (UE) for Unit 1 and Unit 2.

Both Units continued to operating safely with no actuations. There were no radiological releases. An Issue Response Team (IRT) was formed and the site commenced walkdown and inspections of all systems, structures and components for possible seismic damage. All problems found were entered into the site's Corrective Action Program (CAP) and evaluated for operability.

The licensee terminated their Notification of Unusual Event as of 0005 EDT on 8/24/11.

8/23/11 UNUSUAL EVENT - SEISMIC EVENT

Limerick Generating Station ([47185](#))

Seismic event occurred resulting in a Notification of an Unusual Event. No plant impact to either unit. Both units were stable with safety systems functional. There were no personnel injuries and no reports of structural damage.

At 1819 Limerick terminated from the Unusual Event (HU5) based on the conditions that originally presented entry to the Unusual Event (HU5) no longer existing and that it was unlikely that plant conditions would deteriorate. No emergency conditions existed for either unit. Both Unit 1 and Unit 2 were operating at 100% power and were stable. A walk down of the facility was completed with no deficiencies identified. No indication of system degradation was detected.

8/23/11 UNUSUAL EVENT - SEISMIC EVENT

Susquehanna Steam Electric Station ([47186](#))

At 1355 hrs. EDT, an event was recorded by the seismic monitoring system. The seismic monitoring system classified the event as less than Operating Basis Earthquake (OBE) and less than Safe Shutdown Earthquake (SSE). The seismic monitoring system additionally classified the event as Seismic: NO

At 1405 hrs., SSES [Susquehanna Steam Electric Station] declared an Unusual Event [under EAL OU5] after confirmation by outside agencies that an actual seismic event had occurred and reports from numerous personnel that they had detected ground motion.

There was no indication of equipment damage, personnel injuries and no automatic initiations of any ECCS or ESF systems or RPS actuations occurred. Assessment of any equipment damage was ongoing.

The licensee terminated the Notification of Unusual Event at 2110.

8/23/11 UNUSUAL EVENT - SEISMIC EVENT

Palisades Nuclear Plant ([47187](#))

The licensee declared a Notification of Unusual Event under EAL HU1.1 due to seismic activity. There were no reports of personnel injury or significant plant damage.

The licensee terminated the Notification of Unusual Event at 1825 EDT.

8/23/11 UNUSUAL EVENT - SEISMIC EVENT

Oyster Creek Generating Station ([47188](#))

License declared an Unusual Event based on seismic activity.

Oyster Creek terminated from the Unusual Event for seismic activity at 1801.

Engineering walk downs of reactor building, turbine building, switchyard, emergency diesel generators, intake structure, dilution structure, ISFSI (Independent Spent Fuel Storage Installation), and fire pond were completed and no problems noted. All plant conditions remained stable.

8/23/11 UNUSUAL EVENT - SEISMIC EVENT

Surry Power Station ([47189](#))

The licensee declared a Notification of Unusual Event under EAL HU1.1 for seismic activity felt by station personnel. Both units will remained at 100% power. No equipment failures were identified. No Reactor Coolant System or Steam Generator leakage was identified. The plant was accessible. Engineering walkdowns were initiated in the station, switchyard and intake structures.

License terminated the Unusual Event at 1752.

8/23/11 UNUSUAL EVENT - SEISMIC EVENT

Three Mile Island ([47190](#))

At 1401 hrs. EDT on 8/23/11, TMI (Three Mile Island) declared an Unusual Event due to a threshold seismic condition (HU5) earthquake. The earthquake was felt at the plant. No equipment damage was identified. No personnel injuries were reported.

The Unusual Event declared at 1401 EDT due to the ground motion felt at the site was terminated at 1730 EDT. Walkdowns were performed and no equipment damage was identified. The plant remained in a stable condition at 100% power. Offsite power and diesel generators were verified to be unaffected by the event.

8/23/11 UNUSUAL EVENT - SEISMIC EVENT

Salem Generating Station ([47191](#))

On 8/23/11 at 1400 hrs. EDT, Hope Creek and Salem generation stations declared a common site Unusual Event in accordance with EAL 9.5.1.a due to an earthquake felt by onsite personnel within the protected area. The plants were [both] operating at 100% power with no significant anomalies noted. Walkdowns of safety related areas were in progress. All ECCS systems were available and in standby alignment.

Hope Creek and Salem terminated their Notification of Unusual Event at 1941.

8/23/11 UNUSUAL EVENT - SEISMIC EVENT

Hope Creek Generating Station ([47192](#))

On 8/23/11 at 1400 hrs. EDT, Hope Creek and Salem generation stations declared a common site Unusual Event in accordance with EAL 9.5.1.a due to an earthquake felt by onsite personnel within the protected area. The plants were [both] operating at 100% power with no significant anomalies noted. Walkdowns of safety related areas were in progress. All ECCS systems were available and in standby alignment.

Hope Creek and Salem terminated their Notification of Unusual Event at 1941.

8/23/11 UNUSUAL EVENT - SEISMIC EVENT

Harris Nuclear Plant ([47193](#))

The licensee declared a Notification of Unusual Event (NOUE) under EAL HU1.1 based on an earthquake felt at the plant with confirmation by the National Earthquake Center.

The licensee terminated from the NOUE at 1757 EDT. The termination basis was that no safety equipment was impacted by the earthquake and walkdowns of plant safety equipment were complete.

8/23/11 UNUSUAL EVENT - SEISMIC EVENT

Cook Nuclear Plant ([47194](#))

At 1424 hrs. EDT on Tuesday, August 23, 2011, an Unusual Event was declared for Unit 1 and Unit 2 based on Emergency Plan criterion N-1, 'Natural of Destructive Phenomena Inside the Protected Area'. The Unusual Event was declared following detection of ground motion by persons on site with confirmation based on United States Geological Survey information. Plant operation was not impacted by the event. Site structure and system inspections were in progress in accordance with the Abnormal Operating Procedure for earthquake. No damage was identified.

A press release was issued regarding the seismic event. Notifications were made to the local media and Platt News Service.

The Unusual Event due to Seismic Event was terminated at 1723 EDT following an examination of plant systems which revealed no damage due to the seismic event. A press release was issued regarding the termination of the Unusual Event.

8/25/11 UNUSUAL EVENT - SEISMIC EVENT (Aftershock)

North Anna Power Station ([47196](#))

On August 25th at 0118 EDT, North Anna Power Station declare an Unusual Event due to seismic activity onsite (EAL HU 1.1). Both units were shutdown and electrical power was being supplied from offsite. There were no personnel injuries. There was no radiological release. Site structure and system inspections were in progress. No damage was identified.

At 1149 EDT another minor tremor was felt at the station. No geological information was available at the time. There was no immediate indication of any equipment damage. Walkdowns were performed

North Anna Emergency Management indicated that there was no plan to secure from the Notification of Unusual Event until there was sufficient indication that the station would not experience any additional aftershocks to prevent having to re-enter an emergency status once exited.

The status of North Anna, Unit 1 was Mode 5. Unit 2 was in Mode 3 in preparation for cool down.

The licensee exited from its Unusual Event at 1536 EDT on 8/28/11 based on the cessation of any further seismic activity.

8/26/11 10CFR50.72(b) NOTIFICATION - UNANALYZED CONDITION

North Anna Power Station ([47201](#))

On August 23, 2011 at 1351 hours, North Anna Power Station experienced a seismic activity event which resulted in a loss of offsite power and automatic reactor trip of both units. At 1403 hours, an Alert was declared. based on Shift Manager judgment, due to significant seismic activity on the site. Subsequent to the earthquake, both units were stabilized and offsite power was restored. Following the event, seismic data was retrieved from the installed monitoring system and shipped to the vendor to determine the response spectrum for the event. On August 26, 2011 at 1340 hours, initial reviews of the data determined that the seismic activity potentially exceeded the Design Basis Earthquake (DBE) magnitude value above 5 Hz. Therefore, this is reportable per 10CFR50.72(b)(3)(ii) (B) for the nuclear power plant being in an unanalyzed condition that significantly degrades plant safety.

At the time of the report North Anna Unit 1 was in Cold Shutdown with the Residual Heat Removal System providing core cooling. North Anna Unit 2 was in Hot Shutdown and was subsequently taken to Cold Shutdown with the Residual Heat Removal System providing core cooling. No significant equipment damage to Safety Related system (including Class 1 Structures) was identified through site walk-downs nor was equipment degradation detected through plant performance and surveillance testing following the earthquake. Therefore, there was reasonable assurance that the Safety Related systems were fully functional. The Spent Fuel Pit cooling system also remained fully functional and the temperature of the Spent Fuel Pit remained unchanged during the event.

9/1/11 UNUSUAL EVENT - SEISMIC EVENT (Aftershock)

North Anna Power Station ([47228](#))

At 0518 EDT, North Anna Power Station declared an Unusual Event due to seismic activity onsite (EAL HU 1.1). Both units were shutdown and electrical power was being supplied from offsite. There were no personnel injuries. There was no radiological release. Site structure and system inspections were in progress. No damage was identified.

The licensee exited from its Unusual Event at 1223 EDT on 9/01/11 based on completion of plant walk downs and equipment checks, after the latest 3.4 magnitude earthquake, and no damage was noted.

INTERNAL FLOODING (NEI 99-01 IC HU1)

6/8/11 UNUSUAL EVENT - FLOODING POTENTIALLY AFFECTING SAFETY RELATED EQUIPMENT

Braidwood Station ([46936](#))

Flushing activities were in progress on the 2A Auxiliary Feedwater (AF) Pump suction line from the Essential Service Water System (SX). At 1011 CDT, during this flushing activity, the flushing hose ruptured and caused flooding in the Auxiliary Building that had the potential to affect safety related equipment needed for the current operating mode. This was due to the flood waters contacting the motors of the 1A and 2A AF Pumps.

At 1026, an Unusual Event was declared by the Shift Emergency Director because the conditions for EAL entry were met for EAL HU5. Specifically the EAL conditions were 'Flooding in the Auxiliary Building that has the potential to affect safety related equipment needed for the current operating mode.' Auxiliary Feedwater is required to be operable in Mode 1 for each unit.

The leak was immediately isolated (within 45 seconds of hose rupture) and remained isolated. Maintenance personnel subsequently tested the 1A and 2A AF Pump motor to determine operability. The appropriate Tech Spec Action Statements were entered on each Unit for the AF Pumps. The leak also caused the wetting of MCC [Motor Control Center] 132X1, which feeds the 1B AF Pump control power. The Unit 0 [Common] Component Cooling Pump feed breaker cubicle was also wetted. Investigation into these components were also initiated.

The licensee entered Technical Specification LCO 3.7.5 Condition A which required restoration of the one of the AF pumps within 72 hrs. There were no personnel injuries.

At 1122 CDT on 6/8/11, the Unusual Event was terminated due to the flooding conditions no longer existing. Evaluation of wetted components was ongoing.

FIRE/EXPLOSION (NEI 99-01 IC HU2/HA2)

1/19/11 UNUSUAL EVENT - FIRE & EXPLOSION IN THE PROTECTED AREA

Davis Besse ([46551](#))

An electrical fire and explosions were reported near the Containment Access Facility construction area. An Unusual Event was declared based on HU4. Temporary electrical power at service disconnect DSLM3-3 was isolated. The fire was out at 0243 EST. The fire was extinguished using dry chemical. The fire was reported at 0232 EST on 1/19/11. The cause of the fire had not been determined at that time.

The fire and explosions were initially reported by site security personnel. The licensee declared the NOUE at 0243 EST based on criteria HU4. The licensee initially called for offsite assistance in putting out the fire, however, the fire was extinguished by plant personnel and the offsite assistance was turned back. The licensee posted a re-flash watch. The fire reportedly involved temporary cables and possibly a transformer supplying power to the construction area which is located inside the protected area outside the auxiliary building.

The licensee terminated the Notification of Unusual Event at 0358 EST.

2/11/11 UNUSUAL EVENT - FIRE ALARM IN DRYWELL

River Bend ([46611](#))

At 1438 CST on 02/11/2011 a fire detector alarm was received for Recirculation Pump B in the Reactor Building Drywell. At 1453 CST the main control room was unable to determine the alarm was invalid. At that time the condition was met for EAL HU4 for a Fire within the Protected Area boundary that is not extinguished within 15 minutes of detection. At 1507 CST a Notification of an Unusual Event was

declared. The alarm was verified to be invalid following visual inspection at 1513 CST. All Drywell parameters and operation of Recirculation Pump B were verified to be normal.

6/7/11 ALERT - FIRE IN WEST SWITCHGEAR ROOM

Fort Calhoun ([46932](#))

At 0940 CDT an Alert (HA 2, EAL 1) for operating Mode less than 210 degrees F [was] declared for a fire affecting the operability of plant safety systems required to establish or maintain safe shutdown. Time of fire was 0930 CDT. Control room received multiple alarms and 480 V bus 1B4A amps were observed to be oscillating. Bus 1B4A was secured and buses 1B3A and 1B3A-4A were lost. Halon activated properly. At 0956 CDT all notifications to applicable personnel were completed. At 1000 CDT 4160v buses 1A2 / 1A4 were secured to facilitate fire fighting. Spent fuel pool cooling was lost as a result of the de-energized busses and the licensee entered AOP-36 for loss of SFP cooling. Heat up rate was determined by STA. Time to boil for the SFP was calculated to be 88.3 hrs. Spent fuel pool cooling was placed back in service.

Plant was in AOP-1 for flood mitigation at the time. The fire was believed to be flood related. The plant remained in AOP-1.

At about 0930 CDT the licensee noted fire in the west switchgear room. The fire brigade responded and found a room filled with smoke but no active fire. Halon did discharge in the room. At 0956 CDT, offsite assistance was called and Blair Fire Department responded to the site. Blair Fire Department confirmed no active fire in the switchgear room. All offsite power remained available as well as the emergency diesel generators if needed. The licensee attempted to ventilate the room. A thorough inspection was made of the affected area and it was determined that the cause of the electrical fault would be facilitated once the room was fully ventilated.

The licensee entered Alert for HA3, EAL 1 access to a vital area (Switchgear and Turbine Building basement) due to toxic gases present from the fire in the West Switchgear room. The licensee entered HA3 at 1144 CDT. The exit criteria was that the switchgear room was cleared for unimpeded access.

At 1315 CDT, Fort Calhoun Nuclear Station exited Alert HA2, EAL. It was confirmed that no fire remained in the vital area. Plant shutdown cooling remained in-service and spent fuel pool cooling was restored and temperature verified to be lowering. The licensee also exited Alert HA3, EAL 1 after it was

confirmed that the environmental conditions from the event and associated Halon discharge did not affect the ability to safely operate or safely shutdown the reactor due to being in Mode 5 and shutdown cooling remaining in-service. Fort Calhoun remained in Unusual Event HU1, EAL 5 for River Level greater than 1004' elevation as reported under EN [#46929](#).

6/25/11 UNUSUAL EVENT - FIRE LASTING MORE THAN 15 MINUTES

Nine Mile Point ([46985](#))

Unit 1 experienced a confirmed fire in power board H12. The fire brigade responded and the power board was deenergized.

At the time of the notification (0815 EDT), the licensee determined that the fire was out. Power board H12 supplies 480V non-safety plant loads. There was no damage to any safety related equipment and no injuries to personnel. Offsite assistance was not requested.

During the notification, at 0825 EDT, the licensee terminated from the Unusual Event. Unit 2 was not affected by this event.

8/27/11 UNUSUAL EVENT - TRANSFORMER EXPLOSION

Calvert Cliffs Nuclear Power Plant ([47208](#))

At 2248 on 8/27/2011, the Unit 1 Reactor experienced an automatic trip due to loss of load. This trip occurred due to a phase to phase short on the main generator output step-up transformer that resulted from a large section of turbine building siding breaking loose in high winds from Hurricane Irene and impacting the transformer. This impact resulted in an explosion (briefly until the trip removed power from the impact area) which met emergency action level declaration criteria A.U.6.2.2, 'Unanticipated explosion within Protected Area resulting in visible damage to permanent structures or equipment.' The Unusual Event was declared at 2302, 8/27/2011. Follow-up investigation determined no fire resulted from the explosion.

Following the trip, Emergency Procedure, EOP-0, 'Post Trip Immediate Actions' was implemented. All safety functions were met during EOP-0 indicating an uncomplicated reactor trip response, allowing transition to EOP-1, 'Reactor Trip,' at 2300, 8/27/2011. During implementation of EOP-1, it was noted that #14 Containment Air Cooler had stopped running, as had #21 and #24 Containment Air Coolers on

Unit 2. This was investigated and it was determined they had stopped running due to an instantaneous voltage drop that had occurred on the site distribution system during the phase to phase short event. This short duration voltage drop caused the Containment Air Coolers' controller to drop out and secure them. They were restarted without issue.

At 2400, 8/27/2011, numerous alarms on the 1A DG started to be received. These were investigated and it was found that water was intruding down the DG exhaust piping resulting in a DC ground. Based on these indications the 1A DG was declared inoperable and appropriate technical specifications implemented.

Besides the above issues plant response was as expected and EOP-1 was exited at 0130, 8/28/2011. Procedure OP-4, 'Shutdown from Power Operation to Hot Standby,' was implemented at that time. All control rods fully inserted on the reactor trip. The plant was placed in a normal post-trip electrical lineup.

At 0755 EDT the licensee exited the Unusual Event condition based on the fact that they were able to inspect the area in the daylight and were satisfied that they knew the extent and nature of the damage.

9/29/11 UNUSUAL EVENT - FIRE ALARM IN CONTAINMENT

Robinson Nuclear Plant ([47302](#))

During plant startup, a single train fire alarm was received in containment at 0540 EDT on 9/29/2011. An Unusual Event was declared at 0602 EDT based on the containment not being accessible within 15 minutes. An inspection in containment revealed no fire or smoke or the cause for receipt of the alarm.

The Unusual Event was terminated at 0714 EDT on 9/29/2011.

10/8/11 UNUSUAL EVENT - SEVERE ELECTRICAL FAULT IN RCP JUNCTION BOX

Palo Verde Nuclear Generating Station ([47333](#))

Reactor Coolant Pump 2A tripped at approximately 1535 MST, resulting in numerous simultaneous electrical distribution alarms. A walkdown of containment was performed and at 1609 MST it was determined that a junction box, supplying power to the 2A Reactor Coolant Pump, had failed, resulting in the pump tripping on overcurrent protection and an 86 lockout. The plant was operating in forced

circulation and had one train of shutdown cooling in service. As a result, an Emergency Classification of HU2.2, Explosion was declared due to the junction box failure and noise that had been heard in containment.

The plant was in stable condition with one train of shutdown cooling in service with the opposite train of shutdown cooling available to be placed in service. The Unit 1 Reactor Coolant System was at 160 degrees Fahrenheit and 375 psia with the 1A Reactor coolant pump in service for forced circulation.

The event did not result in the release of radioactivity to the environment and did not adversely affect the safe operation of the plant or health and safety of the public.

The Notification of Unusual Event at Palo Verde Unit 1 was terminated at 1916 MST on 10/8/2011. The termination was based on conducting inspections which did not reveal any additional damage or plant impact as a result of this event. Unit 1 remained stable in Mode 5 with RCPs 1A and 1B in service along with one train of RHR in service.

11/16/11 ALERT - FIRE IN ELECTRICAL BUS AFFECTING SAFETY RELATED EQUIPMENT

Davis Besse ([47443](#))

At 0222 EST on November 16, 2011, an Alert was declared due to an electrical fire in the auxiliary building which houses safety related equipment. The apparent cause of the fire was due to an unknown source of water leaking on a breaker, thus causing an arc. The electrical fire was put out. The plant was at 0% power and intended to remain shutdown in Mode 5. There was no impact on core cooling, or emergency power supplies.

At 0443 EST on November 16, 2011, Davis Besse, Unit 1 exited the Alert. The electrical short affected the Control Room Emergency Ventilation Fan #1 Damper.

TOXIC/FLAMMABLE GASES (NEI 99-01 IC HU3/HA3)

3/28/11 UNUSUAL EVENT - SMOKE IN AN ELEVATOR CONTROL CABINET

Seabrook Power Station ([46702](#))

At 1129 EDT on 03/28/11, smoke was detected coming from an elevator power supply transformer in the "B" Residual Heat Removal (RHR) vault. The licensee declared a Unusual Event at 1143 EDT. At 1146 EDT the fire brigade responded and found smoke only and no flame. The smoke stopped when the cabinet was de-energized. At 1158 EDT, the fire was proven to be out when the cabinet was opened. No fire fighting extinguishing agents were used. There was no damage to other plant equipment and no personnel injuries. At 1151 EDT, the licensee activated their Technical Support Center (TSC). The plant was operating at 100% power and remained stable during and after the event.

At 1243 EDT on 03/28/11, the Unusual Event was terminated. Subsequent investigation revealed that no plant equipment damage beyond a power transformer that supplies an equipment elevator occurred. There was no indication of visible flame (smoke only) and no personnel injuries as a result of the event.

3/29/11 UNUSUAL EVENT - ELEVATED CO₂ DUE TO FIRE IN THE DRYWELL

Nine Mile Point ([46704](#))

At approximately 0145 EDT, the Unit 1 control room was notified of elevated carbon monoxide (CO) levels in the Unit 1 Drywell. The cause of the elevated CO was a small fire on a 'Lift-A-Loft'. The fire was immediately extinguished followed by an evacuation of all personnel from the Drywell.

Follow up atmosphere samples indicated carbon monoxide levels above the OSHA Threshold of 50 PPM. Readings were as high as 79 PPM and slowly lowered since the initial response. These values were considered to affect the health of plant personnel or safe plant operation and an Unusual Event was declared at 0155 EDT.

As of 0225 EDT, all values within the Unit 1 Drywell were confirmed to be below the 50 PPM threshold. As of 0226 EDT, the Unusual Event was terminated.

There were no injuries, no offsite assistance required, and the NRC Senior Resident Inspector responded to the site.

4/7/11 UNUSUAL EVENT - HYDROGEN BURN DURING MAINTANANCE [RETRACTED]

Columbia Generating Station ([46739](#))

The licensee declared an Unusual Event at 1607 PDT due to a small hydrogen burn when opening the stator cooling water system for maintenance. There were no injuries or equipment damage. The licensee entered EAL 93U3 'Toxic Gases inside the Protected Area Boundary.

At 2053 PDT, Columbia terminated the Unusual Event declared at 1607 PDT on 04/07/11. Conditions throughout the plant remained stable. Columbia confirmed there was no hazard to personnel safety nor a challenge to safe plant operation.

Based on further investigation, this event was retracted. The stator cooling water system contains a mixture of water and hydrogen when in operation. The system had been removed from service, drained and blanketed with nitrogen prior to commencing maintenance. There was no active source of hydrogen in the system. Although the system had been tested for hydrogen and none was detected, the event occurred when workers cut into a section of the system piping where a small amount of residual hydrogen remained. Immediately following the event, tape was placed over the cut to prevent any debris from entering the pipe. Hydrogen measurements were taken in the vicinity of the cut section of pipe and in the general area and concentrations were below hazardous levels. The only elevated reading occurred directly at the cut location when the tape was removed. This indicated that hydrogen, residual in nature, was confined to the inside of the pipe. Since the system was not in use and the residual hydrogen was confined, plant operations were not affected.

As a result of this event, no personnel were injured, no equipment was damaged, and there was no impact to structures needed for plant operation.

5/3/11 ALERT - TOXIC GAS FROM FIRE AFFECTING ACCESS TO SAFETY RELATED EQUIPMENT

Duane Arnold Energy Center ([46813](#))

The licensee declared an Alert due to a hydrogen fire on the hydrogen pad outside the protected area that resulted in evacuating outbuildings (pump house and air compressor buildings) that contain safety related equipment. The Alert was classified under Emergency Action Level HA-3.2 based on report or detection of gases in concentrations higher than lower flammability limit or contiguous to a safe

shutdown or vital area. The licensee also suspended certain security measures under 50.54(x) and 50.54(y). Security measures were suspended due to risks from the fire with no compensatory measures in-place at this time.

The fire involved hydrogen cylinders delivered to the site to a trailer pad outside the protected area. The fire developed while exchanging a newly delivered trailer of hydrogen cylinders with an expended hydrogen cylinder trailer.

The fire brigade responded and offsite fire departments responded to the site. Fire water was sprayed on the hydrogen cylinders. There was no indication of any damage to any plant equipment other than the hydrogen trailer area equipment. The driver of the hydrogen supply truck was reported to have sustained some injuries. There are no other reported injuries to plant personnel.

The hydrogen water chemistry system was isolated and makeup hydrogen to the main generator was isolated. The hydrogen isolation had no impact on the licensee at this time. The plant continued to operate at full power and there was no immediate impacts from the fire to plant operation.

At 1855 CDT, Duane Arnold re-classified the hydrogen trailer fire event to an Unusual Event level. The event was classified as an UE under EAL HU-5.1 based on other conditions that exist which, in the judgment of the emergency director, indicate events are in progress or have occurred which indicate a potential for degradation for the level of safety of the plant.

The licensee allowed access to all areas that were previously restricted due to potential safety concerns from the ongoing fire. The hydrogen trailer cylinders were being sprayed with water and several cylinders were still showing thermal images above ambient. The licensee stated it would evaluate event termination when the fire could be conclusively demonstrated to be extinguished.

At 0135 CDT on 5/4/11, Duane Arnold terminated from the Unusual Event. The fire was verified to be out, with no hot spots. The hydrogen tanks were isolated and the licensee verified no hydrogen was still present in the area of the hydrogen pad.

5/23/11 ALERT - HALON DISCHARGE IN EMERGENCY DIESEL GENERATOR BUILDING

Brunswick Nuclear Plant ([46873](#))

At 1535 EDT, Brunswick Units 1 & 2 declared an Alert condition due to a discharge of Halon gas into the basement of the emergency diesel generator building (EAL H.A.3.1 for toxic gas discharge into a vital area). Initial inspection indicated that there was no fire. No offsite assistance was required and no personnel injuries as a result of the discharge. Both reactors continued to operate at 100% power. The licensee was investigating the cause of the discharge and stated they would terminate the Alert when the area was ventilated and could be reoccupied.

A later report confirmed that one individual was inside the diesel generator building at the time of the Halon discharge. The individual evacuated the building but complained of chest pains about an hour after the incident. An ambulance was dispatched to transport the individual to the hospital.

The licensee terminated the Alert at 1943 EDT based on restoring normal atmosphere conditions in the emergency diesel generator building. The initiating cause of this event was still being investigated.

6/7/11 ALERT - TOXIC GAS FROM FIRE IN WEST SWITCHGEAR ROOM

Fort Calhoun Station ([46932](#))

At 0940 CDT an alert (HA 2, EAL 1) for operating Mode less than 210 degrees F [was] declared for a fire affecting the operability of plant safety systems required to establish or maintain safe shutdown. Time of fire was 0930 CDT. Control room received multiple alarms and 480 V bus 1B4A amps were observed to be oscillating. Bus 1B4A was secured and buses 1B3A and 1B3A-4A were lost. Halon activated properly. At 0956 CDT all notifications to applicable personnel were completed. At 1000 CDT 4160v buses 1A2 / 1A4 were secured to facilitate fire fighting. Spent fuel pool cooling was lost as a result of the de-energized busses and the licensee entered AOP-36 for loss of SFP cooling. Heat up rate was determined by STA. Time to boil for the SFP was calculated to be 88.3 hrs. Spent fuel pool cooling was placed back in service.

Plant was in AOP-1 for flood mitigation. The fire was believed to be flood related. The plant remained in AOP-1.

At about 0930 CDT the licensee noted fire in the west switchgear room. The fire brigade responded and found a room filled with smoke but no active fire. Halon did discharge in the room. At 0956 CDT, offsite assistance was called and Blair Fire Department responded to the site. Blair Fire Department confirmed no active fire in the switchgear room. All offsite power remained available as well as the emergency diesel generators if needed. The licensee attempted to ventilate the room. A thorough inspection was made of the affected area and it was determined that the cause of the electrical fault would be facilitated once the room was fully ventilated.

The licensee entered Alert for HA 3, EAL 1 access to a vital area (Switchgear and Turbine Building basement) due to toxic gases present from the fire in the West Switchgear room. The licensee entered HA 3 at 1144 CDT. The exit criteria was that the switchgear room was cleared for unimpeded access.

At 1315 CDT, Fort Calhoun Nuclear Station exited Alert HA 2, EAL. It was confirmed that no fire remained in the vital area. Plant shutdown cooling remained in-service and spent fuel pool cooling was restored and temperature verified to be lowering. The licensee also exited Alert HA 3, EAL 1 after it was confirmed that the environmental conditions from the event and associated Halon discharge did not affect the ability to safely operate or safely shutdown the reactor due to being in Mode 5 and shutdown cooling remaining in-service. Fort Calhoun remained in Unusual Event HU 1, EAL 5 for River Level greater than 1004' elevation as reported under EN [#46929](#).

7/15/11 ALERT - TOXIC GAS RELEASE RESTRICTING ACCESS TO VITAL AREA

Dresden Station ([47054](#))

An alert was declared due to a leak of sodium hypochlorite at the unit 2/3 cribhouse. Access to the unit 2/3 cribhouse, which is a vital area, was restricted. The leak was isolated.

The licensee stated that the sodium hypochlorite leak was actually outside the cribhouse and went into a sump. The fumes from the sodium hypochlorite restricted access to the cribhouse which contains safety related ultimate heat sink equipment (containment cooling service water pumps, emergency diesel generator cooling water pumps). Other than restricting access to the cribhouse, the leak had no other impact on plant operation. The alert was declared under EAL H.A.7 - release of toxic gas within or restricting access to a vital area.

The alert was terminated on 7/15/11 at 1520 CDT. The conditions which caused the alert no longer existed. A press release was made for the event. Two employees were sent for offsite medical attention as a precautionary measure; neither employee was contaminated.

The licensee stated that the sodium hypochlorite had leaked from a pipe into a sump under the storage trailer near the cribhouse. The sodium hypochlorite that leaked into the sump was been pumped out. Access to the cribhouse was restored and there were no other access restrictions at the site. Both units continued to operate at full power.

**7/20/11 10CFR50.72 AFTER-THE-FACT NOTIFICATION DUE TO LOW OXYGEN CONCENTRATIONS
IN CONTAINMENT**

Surry Power Station ([47077](#))

At 1650 EDT on 7/20/2011 it was determined that a Notification of Unusual Event (NOUE) was not declared for an event on 6/5/2011. The event occurred at 0501 EDT on 6/5/2011 when a low oxygen atmosphere condition was measured in the Unit 2 reactor containment building. The NOUE should have been declared in accordance with Surry Power Station Emergency Action Level HU3.1 (Report or detection of toxic, corrosive, asphyxiant, or flammable gases that have or could enter the Owner Controlled Area in amounts that can affect normal plant operations). This condition occurred during a refueling outage with maintenance being performed using a liquid nitrogen supplied freeze seal. The freeze seal activity released nitrogen, which slowly caused the low oxygen atmosphere (<19.5%).

In accordance with guidance provided in NUREG-1022, a one hour ENS notification was made due to discovery of an undeclared condition that exceeded an Emergency Action Level.

[Note: This notification was not counted as a declared event for classification statistics]

**7/27/11 ALERT - DUE TO ONSITE RELEASE OF FLOURINE/CHLORINATED FLOURINE GAS
MIXTURE**

Paducah Gas Diffusion Plant ([47099](#))

At 0415 CDT while changing out a cylinder of Fluorine/CL3 gas mixture in the C350 building, apparently a gasket failure occurred and an uncontrolled release of the gas mixture began. The licensee estimates that at the time the release began, there was approximately 160 lbs. of material in the cylinder. The

C350 building was evacuated. There were no personnel injuries as a result of this event. No offsite assistance was requested by the licensee. The local emergency squad responded.

By 0631 the licensee reported that they believed, but had not verified at the time, that the gas leak had been stopped. A 'shelter in place' order was issued for the various buildings. Samples of the exterior of building C350 were negative. Samples of the interior to building C350 were still showing residue and fog in the building.

By 0714 The licensee has verified that the leak has been stopped.

At 0615 CDT, an employee that was involved with the cylinder change-out and response to the event was transported to the onsite medical facility. He was complaining of a burning sensation to his right arm. At 0625 CDT, samples obtained both inside and outside of building C350 were negative.

At 0631 CDT, the licensee had terminated the Alert. The licensee was controlling access to building C350 for investigation. The licensee had setup a recovery team. As a precautionary measure, a second individual that was involved in the cylinder change-out was also transported to the onsite medical facility.

On 7/27/11 at 0710 CDT, the Paducah Gaseous Diffusion Plant decided to issue a press release describing the Alert issued by the plant earlier in the morning. The Alert issued on a chlorine trifluoride (ClF₃) release in the C-350 facility was declared on 07/27/11 at 0415 CDT and terminated on 07/27/11 at 0631 CDT.

9/18/11 ALERT - FREON GAS RELEASE INTO A SAFE SHUTDOWN EQUIPMENT AREA

Callaway Nuclear Plant ([47275](#))

An Alert was declared at Callaway Nuclear Plant at 1056 [CDT] due to EAL HA3.1. Access to an Auxiliary Building area which is prohibited due to release of toxic gas which jeopardizes operation of systems required to maintain safe operations or safely shutdown the reactor. EAL HU3.1 (Unusual Event) is also applicable at the same time.

The cause of the toxic gas release was a Freon gas leak from the 'A' Control Room air conditioner unit.

At 1737 CDT, Callaway Nuclear Plant exited from the Alert for EAL HA3.1, and exited from the Unusual Event for EAL HU3.1. The plant continued to operate at 100% power in Mode 1. There was no

radiological release due to this event. Additionally, a press release was performed after the event closeout.

9/29/11 UNUSUAL EVENT - CHEMICAL SPILL

Limerick Station ([47303](#))

EAL HU7 was declared at 1135 hrs. EDT for a toxic of flammable gas which had been released onsite which could affect plant operations. Plant conditions do not threaten public safety.

Less than 1 gallon of 15% sodium hypochlorite sprayed onto the floor during securing of a completed delivery to the water treatment plant, located within the Protected Area boundary. There were no injuries to personnel.

Limerick terminated from the Unusual Event (HU7) at 1457 due to the threat of toxic gas having been terminated. The sodium hypochlorite leak in the water treatment plant was stopped and clean up activities ongoing. U1 and U2 remained at 100% power. There were no injuries.

10/17/11 UNUSUAL EVENT - AMMONIA LEVELS EXCEEDING OSHA LIMITS

Watts Bar Nuclear ([47348](#))

Normal Operation of WBN [Watts Bar Nuclear] Unit 1 impeded in the Turbine Building, El. 685, West side of the Unit 1 Main condenser due to Toxic Gas (ammonia) concentrations of 75-79 ppm exceeding the OSHA Permissible Exposure Limit (PEL) of 50 ppm, and the ACGIH [American Conference of Governmental Industrial Hygienists] limit of 25 ppm. WBN Unit 1 returned to approximately 100% RTP on Monday, October 17, 2011, following a maintenance outage. Suspect excessive ammonia concentrations due to condenser vacuum pump continuous drains which may need throttling open to increase drain flow, following Unit startup (ammonia is used to treat feedwater for secondary chemistry control). There were no injuries from this event.

At 0047 EDT on 10/18/2011, the licensee terminated the Notification of Unusual Event condition based on ammonia concentrations having been reduced to approximately 6 ppm. Normal personnel access to the affected area was restored. Unit 1 remained at 100% power during this event with no changes or challenges to plant operations. During the event there were no additional EAL designators. During the event there were no significant changes in plant conditions. During the event there were no significant

changes in plant radiological conditions. During the event there were no offsite protective recommendations made by the licensee.

11/1/11 ALERT - AMMONIA LEAK

San Onofre Nuclear Generating Station ([47401](#))

On November 1, 2011 at 1450 PDT, San Onofre Unit 3 declared an Alert and entered EAL HA3.1 due to an ammonia leak that prevented access to local areas. The plant was in a stable condition while the leakage was being secured. The turbine building on Unit 3 was evacuated. Plant personnel were in the process of verifying no presence of ammonia in the turbine building. There was no impact on Unit 2.

At 1807 PDT the licensee exited the Alert and EAL HA3.1. The leak was at the Ammonia Day Tank and was flowing through an overflow vent into the berm. The high level in the Ammonia Day Tank was due to a leaking closed valve between the Demineralizer system and the ammonia bulk storage. The berm area was drained of all fluids. The wind direction caused the ammonia fumes to travel to the Unit 3 turbine deck. No off-site HAZMAT personnel came on-site. At 1756 PDT the precautionary evacuation of on-site personnel was terminated. Unit 2 was not affected from this event.

On November 1, 2011, Southern California Edison notified the California Emergency Management Agency at 1755 PDT and the San Diego Department of Environmental Health at 1810 PDT that approximately 25 gallons of ammonium hydroxide was spilled under the Ammonium Day Tank located outside the Unit 3 turbine building. The spill was contained in a berm under the tank and subsequently cleaned up.

Both Units 2 and 3 were at approximately 100% power at the time of the event.

12/21/11 UNUSUAL EVENT - HYDROGEN LEAK IN TURBINE BUILDING

Clinton Station ([47544](#))

At 1641 CST, during preparations to synchronize the generator, hydrogen pressure began to lower. Personnel were dispatched to identify the source of the leak. At 1752 CST reports from personnel in the turbine building identified high hydrogen levels and the turbine building was evacuated. An Unusual Event [HU7] was declared at 1757 CST and state notification was completed at 1809 CST. Turbine

building roof vents were opened to ventilate the turbine building and all elevations were verified to be clear of hydrogen. Access to the turbine building was restored.

The Unusual Event was terminated at 1838 CST

12/23/11 ALERT - HALON DISCHARGE DURING TESTING

Robinson Nuclear Plant ([47551](#))

The licensee declared an alert condition based on the inadvertent discharge of Halon gas into their Emergency Bus Room during system testing. Plant operation was unaffected and the unit continued to operate at full power.

There were no injuries or equipment damage due to the event. The licensee observed no fire or flames in the area. The licensee evacuated the area and provided ventilation to disperse the Halon.

At 1810 EST on 12/23/11, Robinson terminated the Alert condition based on a return to a habitable atmosphere in the Emergency Bus Room. The cause for the Halon System actuation appears to have been a Human Performance Error. The test/inhibit switch was placed in the incorrect position.

There were no radiological releases for this event.

SECURITY (NEI 99-01 IC HU4)

1/19/11 UNUSUAL EVENT - SECURITY EVENT

ANO ([46555](#))

The licensee declared an Unusual Event based upon a potential security incident at the site. Contact the Headquarters Operations Officer for additional details.

7/14/11 UNUSUAL EVENT - SUSPECTED INTRODUCTION OF CONTRABAND INTO PROTECTED AREA

Fort Calhoun Station ([46051](#))

The licensee declared an Unusual Event due to indications that potentially dangerous contraband had been introduced into the protected area. After further investigation, the licensee determined that the indication of contraband was due to incorrect interpretation of screening equipment imaging. The licensee exited its Unusual Event declaration at 1942 CDT. The licensee continued to investigate the circumstances leading to this event declaration

7/16/11 UNUSUAL EVENT - ENTRY INTO HU4.1 [RETRACTED**]**

San Onofre Nuclear Generating Station ([47064](#))

The licensee declared an Unusual Event at 0612 PDT due to entry into EAL HU4.1 for a security-related event. Contact the Headquarters Operations Officer for details.

The licensee exited the Unusual Event at 0950 PDT after verifying that the exit criteria for EAL HU4.1 had been met. Contact the Headquarters Operations Officer for details.

After further investigation, the licensee determined that the declaration of the Unusual Event had been a conservative action not required by site procedures. Contact the Headquarters Operations Officer for details.

8/27/11 UNUSUAL EVENT - ENTRY INTO HU4.1

Comanche Peak Steam Electric Station ([47205](#))

The licensee declared a Notification of Unusual Event per emergency plan condition HU 4-1 due to a security event. Contact the Headquarters Operations Officer for details.

The Notification of Unusual Event was terminated. Contact the Headquarters Operations Officer for details.

LOSS OF ANNUNCIATORS (NEI 99-01 IC SU3)

3/24/11 UNUSUAL EVENT - LOSS OF ANNUNCIATORS DURING PLANNED MAINTENANCE

Braidwood Station ([46694](#))

During a planned maintenance activity on the Unit 2 main control room alarm cabinets, it was identified that all Unit 2 safety system annunciators were lost. This was identified at 1006 CDT. Main Control Board indicators remained functional. At 1018 CDT, the Shift Manager declared an Unusual Event under Emergency Action Level MU6. This was due to an unplanned loss of most (approximately 75%) safety system annunciators for > 15 minutes. The planned maintenance activity was not expected to affect the amount of annunciators that were lost.

At 1030 CDT, the planned maintenance clearance order was cleared and power was restored to the Unit 2 annunciators.

There was no transient on other plant equipment and the plant remained stable before and after this event. The cause for the unexpected loss of annunciators is not clearly understood and was under investigation.

The Unusual Event was terminated at 1047 CDT on 03/24/11. All annunciators were restored and an investigation was conducted to determine the cause.

3/30/11 UNUSUAL EVENT - DISCOVERY OF AFTER-THE-FACT LOSS OF ANNUNCIATION

Braidwood Station ([46712](#))

An extent of condition review of Braidwood Unit 2 unplanned loss of safety system annunciators Emergency Plan Unusual Event on March 24, 2011 (ENS number [46694](#)) was performed for both Units of Braidwood Station. During this review it was identified that a previous unknown loss of annunciators had also occurred on August 10, 2010 from 1024 to 1136 CT on Unit 2. This condition occurred during planned maintenance on annunciator cabinet 2PA19J power supply capacitors.

The maintenance performed on August 10, 2010 would normally not cause a loss of all Unit 2 annunciators. During the work, it was expected to lose approximately one third of the annunciators. Latent annunciator system problems identified from the March 24, 2011 event caused a loss of all Unit 2 annunciators and contributed to this condition being unknown to Main Control Room operators. All Unit 2 indications and computer points to the sequence of events recorder remained available and Unit 2 was stable during this timeframe.

At 1538 CDT on 3/30/11, it was determined that the August 10, 2010 condition met the threshold for Emergency Action Level MU6, UNPLANNED loss of most or all safety system annunciation or indication in the control room for greater than 15 minutes. This notification was made as an undeclared Unusual Event Emergency Plan Classification per 10 CFR 50.72(a)(1)(ii).

Per NUREG 1022, a 1- hour notification is required when a condition existed which met the emergency plan criteria but no emergency was declared and the basis for the emergency class no longer exists at the time of the discovery.

RCS LEAKAGE (NEI 99-01 IC SU5)

2/18/11 UNUSUAL EVENT - EXCESSIVE LEAKAGE FROM A CHARGING SYSTEM [RETRACTED]

Comanche Peak Steam Electric Station ([46625](#))

At 1045 CST, on 2/18/11, Comanche Peak Unit 1 declared an Unusual Event related to excessive leakage from the charging system. The 40 GPM leakage was in excess of the specified limit of 25 GPM. At 1121 CST, the charging system leakage was verified isolated. Unit 1 was in stable condition and remained at 100% power. No offsite assistance was required.

At 1311 EST, Comanche Peak Nuclear Power Plant terminated the Unusual Event. The leaking valve in the charging system was isolated reducing the leakage to zero. Repairs to the valve were being planned.

A follow-up notification informed the NRC that Comanche Peak Nuclear Power Plant was retracting Event Number 46625, the Unusual Event declaration reported on February 18, 2011 at 10:45 CST.

The declaration was made based on EAL SU8.1, [Reactor Coolant System] RCS Leakage, and was terminated on February 18, 2011 at 13:11 Central Standard Time. The declaration was retracted because the source of the leakage was from the Chemical and Volume Control System (CVCS) and not from the Reactor Coolant System.

5/6/11 10CFR50.72 NOTIFICATION - AFTER-THE-FACT RCS LEAKAGE

Waterford 3 Steam Electric Station ([46824](#))

Operators were making preparations to fill the Containment Spray System riser to support outage activities. At 0204 CDT, when Containment Spray Riser Isolation Valve CS-125A was opened, pressurizer level began to lower. The licensee suspects leak-by of a valve in the Shutdown Cooling System. At 0214 CDT, the leak was stopped. Pressurizer level was lowered by 2.6%.

After reviewing the event, the licensee determined that the leak rate was greater than 25 gpm which would have resulted in a declaration of an Unusual Event under EAL CU1. Since the event had concluded, no declaration was made.

[Note: This notification was not counted as a declared event for classification statistics]

7/14/11 UNUSUAL EVENT - RCS LEAKAGE GREATER THAN 10 GPM

Salem Generating Station ([47052](#))

At 2053 on July 14, 2011 Salem unit 2 declared an Unusual Event due to reactor coolant system leakage greater than 10 gallons per minute. While performing a monthly Emergency Core Cooling System vent of the high head safety injection piping a motor operated valve was opened and a leak developed on the high head piping greater than 10 gallons per minute. The leak rate was approximately 11-15 gallon per minute. The leak was terminated when the motor operated valve was closed. The time of the leak was about 6 minutes. The leak was believed to be from a crack on the Boron Injection Tank (BIT) relief valve line which is connected to the high head piping. A total of approximately 90 gallon of reactor coolant leaked into the BIT room. The licensee declared the high head safety injection inoperable proceeded to shutdown under Tech Spec 3.0.3.

Salem Unit 2 declared an Unusual Event due to Reactor Coolant System (RCS) leakage being greater than 10 gpm and pressurizer level decreasing. Leakage was estimated to be approximately 15 gpm. The leakage was determined to be from a weld on the high head charging injection relief valve connection. This leaking weld impacts both trains of high head charging/safety injection. Both trains of high head charging/safety injection were declared inoperable at 2038 [EDT] on July 14, 2011, entering TS 3.0.3. Salem Unit 2 began the Technical Specification shutdown in accordance with TS 3.0.3 at 2136 [EDT].

Salem Unit 2 exited the Unusual Event as of 0339 EDT. The criteria for exit was the leakage rate was below the 10 gpm rate. The plant was in Mode 3 and was preparing to cooldown.

**8/6/11 UNUSUAL EVENT - PLANT SHUTDOWN DUE TO DRYWELL UNIDENTIFIED LEAKAGE
GREATER THAN 10 GPM**

Nine Mile Point ([47129](#))

At 0152 EDT, Nine Mile Point Unit 2 received red alarms for containment monitoring cabinets 10A and 10B along with a rise in drywell floor drain leakage and drywell pressure. At 0205 EDT, Nine Mile Point Unit 2 entered technical specification action statement (TS 3.4.5 B) due to unidentified leakage rise of greater than 2 gpm within 24 hours. At 0217 EDT, the control room commenced power reduction to mitigate the rise in drywell leakage and drywell pressure. At 0322 EDT, Nine Mile Point Unit 2 declared an Unusual Event (EAL 2.1.1) due to unidentified drywell leakage greater than 10 gpm. Actual drywell floor drain leakage reached 11.3 gpm.

The cause of the rise in unidentified leakage was unknown at the time. At 0345 EDT, Nine Mile Point Unit 2 commenced a plant shutdown.

The licensee terminated Notification of Unusual Event at 1127 EDT because leakage rates, drywell level, drywell pressure, radiation levels, and all other parameters on the licensee checklist were normal and stable. The licensee continued to power down in order to perform inspections in the drywell area.

9/16/11 UNUSUAL EVENT - PRIMARY SYSTEM LEAKAGE GREATER THAN 10 GPM

Palisades Nuclear Plant ([47271](#))

The licensee declared an Unusual Event for Palisades Unit 1 on 09/16/2011 at 1450 EDT based on EAL SU 8.1, RCS (Reactor Coolant System) leakage exceeding 10 gallons per minute (gpm). The licensee was monitoring an increase in RCS leakage, and at a rate of 3.5 gpm entered their off normal procedure and began shutting down the plant. Technical Specification requires the plant to be in Mode 3 within 6 hours. Leakage increased to greater than 10 gpm, and at 1454 EDT the reactor was manually tripped from 79% power. All control rods fully inserted, and the shutdown was described by the licensee as uncomplicated. Unit 1 is stable in Mode 3.

No safety injection was required since two charging pumps (B&C) were able to keep up with RCS leakage estimated to be between 14 and 15 gpm. Pressurizer level was restored to 43% and rising. RCS pressure was greater than 2000 psi and RCS temperature was being maintained at no load T_{ave} of 535°F on the turbine bypass valves. There was no indication of any primary-to-secondary leakage and all equipment was available except for charging pump 'A', which was tagged out of service for planned maintenance.

An entry into containment was made and the licensee had identified the source of the RCS leakage as being in the vicinity of the 'A' pressurizer spray control valve #1057. This was based on a steam plume seen from below the pressurizer looking up through grating towards this valve.

At 1934 EDT the licensee terminated from their Unusual Event due to EAL SU 8.1. The plant was still in Mode 3 with a leak rate of 0.324 gpm. The licensee confirmed that the leak is a result of the packing gland backing out of pressurizer spray valve #1057.

11/16/11 UNUSUAL EVENT - DRYWELL LEAKAGE GREATER THAN 10 GPM

Brunswick Nuclear Plant ([47444](#))

On 11/16/11 at 0208 EST, Brunswick Nuclear Plant, Unit 2 calculated a drywall floor drain 42 minute leak rate of 5.88 gpm, following several hours of gradually rising floor drain leakage during a plant startup. Tech Spec 3.4.4 A was entered, requiring floor drain leakage to be restored below 5 gpm within 8 hours. At 0253 EST, a 45 minute leak rate of 10.11 gpm was calculated. At 0301 EST, Unusual Event SU 6.1 was declared for unidentified leakage exceeding 10 gpm, and at 0309 EST, a manual reactor scram was inserted from approximately 7% power. Following the scram, the reactor was depressurized at a maximum cooldown rate of 92.5 deg F/hr, and the unidentified leak rate fell to less than 10 gpm within 1 hour and less than 5 gpm within 2 hours. The leak rate at 0614 EST on 11/16/11 was 3.82 gpm with reactor pressure at 228 psig.

The exact nature of the leak was unknown at the time. The plan was to continue to depressurize and cool down the reactor to Mode 4, such that a full drywell inspection could commence. Level control was being maintained with control rod drives (CRD). The MSIVs were manually closed to control cooldown. The maximum cooldown was observed to be 92.5 F/hour. The plant planned to reopen MSIVs and depressurized to condensate booster pump injection pressure of 350 psig. The plan was to achieve Mode 4 for a leak inspection.

The leakage rate dropped to 3.73 gpm. The decrease was due to lower pressure which was at the time at 258 psig. The leakage source was still not identified at the time.

By 0648 the leakage rate was below the T.S. limit due to lower pressure which was then at 210 psig. The leakage rate stabilized at 3.04 gpm at 183 psig at 0708 EST.

The licensee terminated from their Unusual Event at 0815 EST. The leakage was still unidentified.

12/5/11 UNUSUAL EVENT - DISCOVERY OF AFTER-THE-FACT RCS LEAKAGE

North Anna Power Station ([47497](#))

At approximately 0847 EST, Unit 1 Letdown Pressure Control Valve, 1-CH-PCV-1145, began acting erratically which resulted in the Letdown Relief Valve, 1-CH-RV-1203, lifting and flowing to the Pressurizer Relief Tank.

At 0848 EST, the relief valve reseated and the leakage stopped. Approximately 42 gpm leakage resulted from the relief valve lifting.

This identified flow rate exceeded the threshold for entry into a Notification of Unusual Event under EAL tab SU6.1 due to identified leakage greater than 25 gpm.

The licensee performed troubleshooting of the Letdown Pressure Control Valve.

LOSS OF AC POWER

4/16/11 UNUSUAL EVENT - LOSS OF OFFSITE POWER DUE TO TORNADO DAMAGE

Surry Power Station ([46761](#))

At 1849 hrs, Surry Power Station (SPS) Unit 1 and Unit 2 experienced an automatic Reactor Trip from a Loss of Offsite Power (LOOP), as a result of a tornado touching down in the station's switchyard. Unit 1 reactor tripped as a result of a Loss of Coolant Flow > P-8 (35% power), and the Unit 2 reactor tripped as a result of a 500 kV Leads Differential Turbine-Generator trip. Both units responded as designed.

Unit 1 electrical power was being provided by Number 1 Emergency Diesel Generator (EDG) to the 1H emergency bus, with the Station Blackout (SBO) diesel loaded on to the 1J emergency bus. Unit 2 electrical power was being supplied by the number 2 EDG to the 2H emergency bus, with the number 3 EDG loaded on to the 2J emergency bus.

All Unit 1 control rods inserted on the reactor trip, and all Unit 2 control rods inserted on its respective reactor trip. The Low Level Intake Structure (LLIS) was without power. All three Emergency Service Water Pumps were running to supply the intake canal. Efforts were underway to restore Bus 7, which would give each unit an emergency bus powered by offsite power (Unit 1 1J, Unit 2 2H) and restore power to the LLIS.

Decay heat was being removed by Auxiliary Feedwater on both units and atmospheric steam release via the steam generator PORVs. Both units were on natural circulation. All other system parameters were normal and stable.

At 1855 hrs a NOUE was declared due to a loss of offsite power (applicable to U1 and U2). Additionally, due to an estimated 100 gallon fuel oil spill from an above ground storage tank near the station's

garage, the Virginia State Department of Environmental Quality was notified at 2041 and the Surry County Local Emergency Planning Coordinator was notified at 2114. At 2334, the Virginia State Department of Environmental Quality was notified and the Surry County Local Emergency Planning Coordinator was notified at 2336, due to an estimated 200 gallon oil leak to the ground from a station switchyard transformer damaged during the tornado.

The licensee exited the emergency condition at 0745 EDT on 4/19/11. Offsite power was restored, and the plant was shutdown and cooled down.

4/27/11 UNUSUAL EVENT - LOSS OF OFFSITE POWER

Browns Ferry Nuclear Station ([46793](#))

At 1701 CDT, the licensee declared a Notification of Unusual Event under Emergency Action Level 5.1U due to loss of offsite power for >15 minutes. The loss of offsite power occurred at 1635 CDT and was due to severe weather and winds in the vicinity. When offsite power was lost, all 3 units automatically scrammed. The units were stable in Mode 3 with their respective 4KV busses being supplied by the onsite Emergency Diesel Generators[EDG]. The 161KV Athens line was the only offsite power source energized. All onsite safe shutdown equipment was available with the exception of the Unit 3 B EDG which was out of service for planned maintenance.

The system actuations that occurred during the loss of offsite power were actuations of the Reactor Protection System, Primary Containment Isolation System (PCIS) and Emergency Diesel Generators. All primary containment valves actuated by the PCIS operated as expected. Unexpectedly, the Unit 3 "B" Main Steam Isolation Valve indicated intermediate. Unit 1 High Pressure Coolant Injection actuated when reactor water level reached -45". Reactor Core Isolation Cooling (RCIC) was already initiated at the time.

Following the loss of offsite power only 12 of the required 100 offsite emergency sirens were operable.

As a result of the loss of offsite power, the Diesel-driven Fire Pump auto-started. While the pump was running, the licensee discovered that approximately one quart of oil had leaked from the fire pump into the cold water channel which discharges into navigable waterways. The licensee confirmed this at 1950 CDT by visually identifying a sheen in the channel.

The licensee notified the National Response Center of the spill and, in accordance with their site discharge permit, notified the State of Alabama.

At 2120 CDT, operators on Unit 1 were controlling reactor water level between 2 and 51 inches when RCIC became sluggish and water level dropped to +2" causing a valid RPS Scram signal as well as PCIS signals 2, 3, 6, and 8. All valves operated as expected and all isolations were completed.

At 2120 CDT, Unit 1 received a low reactor water level scram due to reactor water level lowering to +2 inches following sluggish RCIC response at low reactor pressure. At the time of this event RCIC and CRD were injecting to the vessel and the reactor level band specified was +2 to +51 inches. A valid Containment Isolation signal was received and groups 2, 3, 6 and 8 isolated as expected. Water level was immediately restored to within the specified band (RCIC).

At 2050 CDT, on 05/02/2011, the previously declared and reported NOUE (EAL Designator 5.1U) due to loss of normal and alternate voltage to all 4kV SD Boards for greater than 15 minutes and at least two Diesel Generators supplying power to unit specific 4kV SD Boards was terminated due to the conditions requiring entry being resolved. At that time, offsite power was restored from two 161kV sources (Athens and Trinity), all eight 4kV SD boards were being powered from offsite sources, and six of eight Emergency Diesel Generators (B, C, D, 3A, 3C, 3D) were operable and in standby readiness. Emergency Diesel Generators A and 3B were not operable but were available at the time. All three units remained shutdown, in Mode 4, pending return of the 500 kV grid system.

11/27/11 UNUSUAL EVENT - LOSS OF OFFSITE POWER DURING SWITCHING OPERATIONS

Point Beach Nuclear Plant ([46478](#))

At 0238, Point Beach Unit 1, classified an Unusual Event based on CU3.1, loss of power to or from the 1X-04 transformer that results in a loss of all offsite power to both safety-related busses 1A-05 and 1A-06 for greater than 15 minutes and at least one emergency [diesel] generator is supplying power to an emergency bus.

The 1X-04 transformer converts 345 kV to 13.8 kV. Both Emergency Diesel Generators were running supplying the safety-related busses.

By 0843 off-site power to Unit 1A-05 and 1A-06 Safeguards Busses was restored via Unit 2 2X-03 High Voltage Station Transformer and 1X-04 Low Voltage Station Transformer. During the transient, all four Emergency Diesel Generators (EDGs) started as expected with G-01 EDG supplying the Unit 1 1A-05 Safeguards Bus and G-03 EDG supplying 1A-06 Safeguards Bus. Off-site power to the Unit 2 Safeguards Buses was not affected.

All systems responded as designed during the transient and operators performed in accordance with procedures and their training. Unit 1 was stable in Mode 5 within normal operating bands. Unit 2 remained operating at 100% power.

The Unusual Event was terminated at 0700 CST on November 27, 2011.

FUEL CLAD DEGRADATION

6/24/11 UNUSUAL EVENT - INDICATIONS OF FUEL DAMAGE

Kansas State University ([46982](#))

The reactor operated at 10 W to 25 kW steady-state power for a total of 25 minutes. At 1257 CDT the Reactor Manager noticed that the radiation monitor (AMS-4) was reading approximately 80 times the Derived Air Concentration (DAC) for Iodine. A second continuous air monitor and a portable thin-window ionization chamber both read background levels of radiation. A high-volume air sampler was used to sample the air near the sampling location of the AMS, which draws air from the reactor deck. The filter from the air sampler read 3700 DPM after drawing 50 cubic feet of air, indicating elevated levels of activity. An HPGe (High Purity Germanium Detector) spectrograph indicated some Cs-137 in the air filter sample, but no I-131. Primary water activity and conductivity were both at normal levels. The indicated DAC of Iodine increased to a value of 149 times DAC before decreasing to 145 times DAC.

The Reactor Manager and Radiation Safety Officer agreed that fuel damage was unlikely, but the results of testing were inconclusive, and that it would be prudent to declare an Unusual Event.

HPGe spectroscopy indicated only background levels of Cs-137 for a air sample, a primary water sample, and a swipe taken from the reactor deck. None of these samples showed I-131. A second portable air sample taken at the reactor deck, but on the opposite side of the deck from the radioactive sampling handling table, did not have elevated counts.

The Reactor Manager and Radiation Safety Officer agreed that the AMS-4 was most likely mis-calibrated, and the elevated levels in the first high-volume air sample were probably due to the proximity of the radioactive sample handling table to the sampling location.

OTHER

1/8/11 UNUSUAL EVENT - CATASTROPHIC FAILURE OF NON-SAFETY RELATED BREAKER

Palisades Nuclear Plant ([46524](#))

A Notification of Unusual Event was declared for 'Hazards and other conditions affecting plant safety' at 1303 EST for Emergency Action Level (EAL) HU1 as a result of a breaker/bus fault in a non-safety related feeder bus 'F'. The loss of the bus resulted in loss of cooling water tower pumps and fans and subsequently a loss of one cooling tower. There was indication of a pressure transient on the breaker panel and smoke but no fire. There was no indication of sabotage or terrorism, and no offsite assistance requested. There was no radiological release in progress. The NRC remained in the normal mode. Plant was stable at 55 % reactor power following a down-power maneuver from 100% reactor power with all safety related equipment operable.

At 0043 Palisades terminated from their Unusual Event for 'Hazards and Other Conditions Affecting Plant Safety'. The faulted bus was isolated, and licensee started their investigation into the cause of this incident. The licensee tagged out and racked out the breaker, and isolated the startup power to the 'F' bus. The associated Startup Transformer was also isolated. The 'F' bus and associated Startup Transformer would remain de-energized until the situation was better understood, and repaired if necessary. Power levels were maintained at 53% due to the loss of associated equipment supporting one cooling tower.

3/11/11 UNUSUAL EVENT - TSUNAMI WARNING

Diablo Canyon Power Plant ([46668](#))

The licensee declared a Notification of Unusual Event as a result of a tsunami warning issued for the coastal areas of California. The tsunami warning was a result of a 8.9 magnitude earthquake off the

coast of Japan. The licensee was in EAL HU1.5, 'Tsunami Affecting the Protected Area'. The NRC remained in the normal response mode.

A classification of Unusual Event was declared at 0123 PST on March 11, 2011 due to a tsunami warning issued by the NOAA for the California West Coast. Diablo Canyon Power Plant [DCPP] implemented the requirements of Casualty Procedure M-5, 'Response to Tsunami Warning.' Plant personnel were evacuated from the DCPP intake structure at 0742 PST. Evacuation of personnel from the intake structure constituted a deviation from DCPP license condition '2.E' and was authorized pursuant to 10CFR50.54(x).

No damage or injuries were observed as a result of this tsunami event and there was no impact on the health and safety of the general public."

Diablo Canyon terminated their Unusual Event at 1528 PST because the tsunami warning was reduced to a tsunami advisory. No damage occurred during this event.

4/5/11 ALERT - ACID LEAK GREATER THAN 40CFR LIMIT

B&W Uranium Fuel Fabrication ([46725](#))

The licensee secured their process after an acid leak greater than the 40 CFR limit developed at a piping joint. The leak consisted of a mixture of hydrofluoric and nitric acid. A licensee response team was dispatched to the site of the leak to evaluate the condition.

No injuries resulted and there were no evacuations nor health and safety consequences at the site.

The licensee exited the emergency condition at 1237 EDT on 4/5/11. The spill was contained and no longer posed any threat to employees or the environment.

On April 5, 2011 during a line inspection at B&W NOG-L, a leak was discovered coming from a 6 inch waste acid line. The leak was in a location that the technician could visually inspect but with limited accessibility because of its proximity to an embankment obstruction. After finding a way to safely determine that waste was leaking from the line at a pH <2, the site Emergency Operation Center was activated and Emergency Team was notified to respond. It was determined that a Reportable Quantity (RQ) of an acidic waste solution (D002) had been released. Notifications were made to EPA Region III, VA DEQ, National Response Center, Nuclear Regulatory Commission, and other Emergency Response

organizations as required by the site Emergency Plan. Efforts were taken to ensure the spill was contained to the immediate paved and soil areas. The accumulating liquid was contained with absorbent booms and neutralized with soda ash . It is estimated that 200 gallons of waste solution leaked onto the ground. Approximately seven 55 gallon drums (@ 1500 Pounds) of clean up waste were generated and will be disposed of appropriately.

There were no injuries during the spill or during the cleanup operations. The threat to the environment and human health was minimal due to the leak's isolated location . Access to the area was limited and air monitoring in the area did not show any concerns. All released material was contained to the spill area or the cleanup zone.

Plant operations draining to this line were halted until the repair was completed . Restart of operations was authorized on April 6, 2011. An investigation of the incident to determine the root cause was performed and corrective actions will be implemented to prevent reoccurrence

5/3/11 UNUSUAL EVENT - OTHER CONDITION WARRANTING CLASSIFICATION

Duane Arnold Energy Center ([46813](#))

The licensee declared an Alert due to a hydrogen gas release and subsequent hydrogen fire on the hydrogen pad outside the protected area that resulted in evacuating outbuildings (pump house and air compressor buildings) that contain safety related equipment. The Alert was classified under Emergency Action Level HA-3.2 based on report or detection of gases in concentrations higher than lower flammability limit or contiguous to a safe shutdown or vital area. The licensee also suspended certain security measures under 50.54(x) and 50.54(y). Security measures were suspended due to risks from the fire with no compensatory measures in-place at this time.

The fire involved hydrogen cylinders delivered to the site to a trailer pad outside the protected area. The fire developed while exchanging a newly delivered trailer of hydrogen cylinders with an expended hydrogen cylinder trailer.

The fire brigade responded and offsite fire departments responded to the site. Fire water was sprayed on the hydrogen cylinders. There was no indication of any damage to any plant equipment other than the hydrogen trailer area equipment. The driver of the hydrogen supply truck was reported to have sustained some injuries. There are no other reported injuries to plant personnel.

The hydrogen water chemistry system was isolated and makeup hydrogen to the main generator was isolated. The hydrogen isolation had no impact on the licensee at this time. The plant continued to operate at full power and there was no immediate impacts from the fire to plant operation.

At 1855 CDT, Duane Arnold re-classified the hydrogen trailer fire event to an Unusual Event level. The event was classified as an UE under EAL HU-5.1 based on other conditions that exist which, in the judgment of the emergency director, indicate events are in progress or have occurred which indicate a potential for degradation for the level of safety of the plant.

The licensee allowed access to all areas that were previously restricted due to potential safety concerns from the ongoing fire. The hydrogen trailer cylinders were being sprayed with water and several cylinders were still showing thermal images above ambient. The licensee stated it would evaluate event termination when the fire could be conclusively demonstrated to be extinguished.

At 0135 CDT on 5/4/11, Duane Arnold terminated from the Unusual Event. The fire was verified to be out, with no hot spots. The hydrogen tanks were isolated and the licensee verified no hydrogen was still present in the area of the hydrogen pad.

6/6/11 UNUSUAL EVENT - HIGH RIVER LEVEL

Fort Calhoun Station ([46929](#))

At 0800 CDT a Notification of Unusual Event (HU1, EAL 5) for operating mode less than 210 degrees F is being declared for a river level expected to exceed 1004' MSL (Mean Sea Level), but less than or equal to 1009' MSL elevation. Abnormal Operating Procedure AOP-1 was being implemented for high river level, as well as, PE-RR-AE-1001 for Flood Barrier and Sandbag Staging and Installation.

At 1342 CDT on 08/29/11, Fort Calhoun Station terminated the Notification of Unusual Event for flooding. Missouri river level receded to less than entry criteria and was at 1003.56 ft MSL at the time of termination.

6/19/11 UNUSUAL EVENT - MISSOURI RIVER FLOODING

Cooper Nuclear Station ([46969](#))

At 0402 CDT on 6/19/2011 a Notification of Unusual Event was declared due to the elevation of the Missouri River reaching 899.1 feet above mean sea level. This is above the Emergency Action Level

HU1.5 elevation of 899 feet. The Missouri River was expected to crest at 899.5 feet within the next couple of days. It was expected that the elevation of the Missouri River would remain above 899 feet for most of the summer.

Actions were in progress in accordance with the site flooding procedure, including strategic placement of sand bags at building entrances and important facilities. There was no major plant equipment out of service at the time. Personnel access to the site was not impeded. Emergency evacuation routes remained available.

On 6/19/2011 at 0447 CDT, Nebraska Public Power District issued a press release concerning the declaration of a Notification of Unusual Event declared for the Missouri River elevation above 899 feet above sea level.

At 0402 CDT, Missouri River elevation was at 899.1 feet. No updated river projections were available at the time. River level was expected to remain at least below plant grade elevation. No deficiencies with the nearby protective levees had been identified surrounding the plant. Actions were in progress in accordance with the site flooding procedure, including strategic placement of sandbags at building entrances and important facilities. Personnel access to the site was impeded, and required emergency evacuation routes remained available.

Cooper Nuclear Station exited the Notification of Unusual Event (NOUE) at 0947 CDT on 7/12/11. River level was at 895.8 feet MSL at the time of termination which is below the NOUE threshold of 899 feet MSL. River level was forecasted to continue going down.

Should you have questions about contents please contact **Kelly Walker** (<mailto:ossikelly@aol.com>) - (704 243-0501)

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