INL/EXT-15-35237

Idaho National Laboratory Quarterly Performance Analysis for the 2nd Quarter FY 2015

Lisbeth A. Mitchell

April 2015

The INL is a U.S. Department of Energy National Laboratory
operated by Battelle Energy Alliance

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Idaho Falls, Idaho 83415

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Idaho National Laboratory

Quarterly Performance Analysis

DEEPER LEARNING THROUGH EVENT ANALYSIS

Contents

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FY-15 2ND Quarter

This report is published quarterly by the Idaho National Laboratory (INL) Quality and Performance Management Organization.

The Department of Energy (DOE) Occurrence Reporting and Processing System (ORPS), as prescribed in DOE Order 232.2, "Occurrence Reporting and Processing of Operations Information," requires a quarterly analysis of events, both reportable and not reportable, for the previous 12 months. This report is the analysis of 77 reportable events (18 from the 2nd Qtr. FY-15 and 59 from the prior three reporting quarters), as well as 32 other issue reports (including events found to be not reportable and Significant Category A and B conditions reported) identified at INL during the past 12 months.

Battelle Energy Alliance (BEA) operates the INL under contract DE-AC07-051D14517.

Highlights…

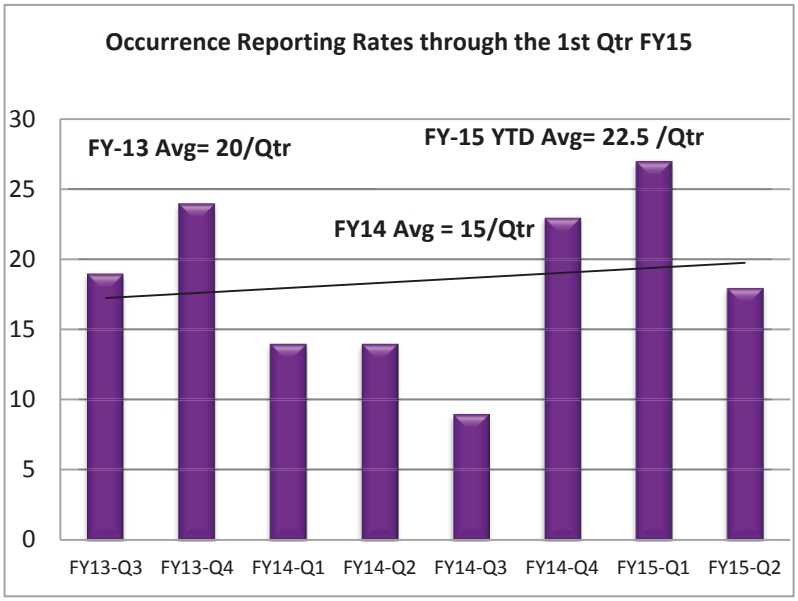
The quarterly average number of reportable events at the INL increased from 15 in FY-14 to 22.5 in FY-15. Thirty-one percent of the FY-15 events were associated with performance degradation of safety class safety significant components at the Advanced Test Reactor (ATR).

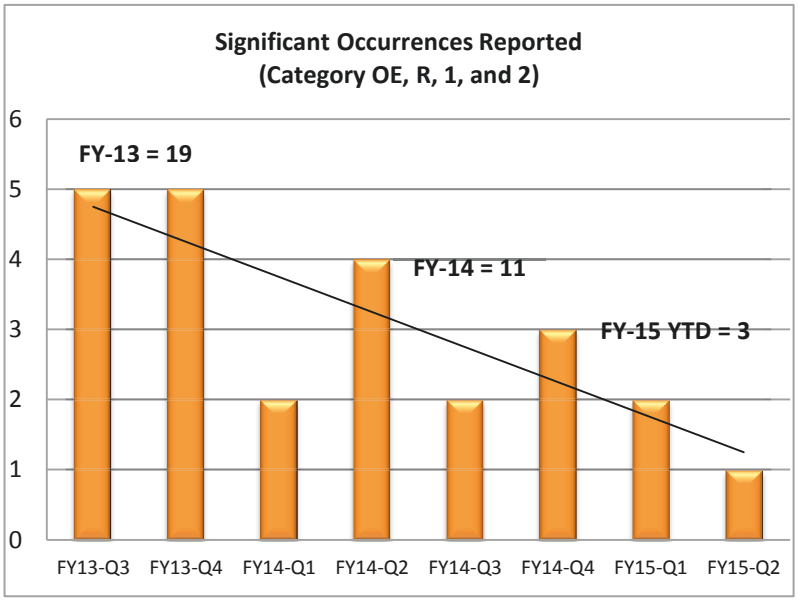
The rate of significant events (those reported as Operational Emergencies, Recurring Issues, and/or Significance Categories 1 or 2) continues to trend downward.

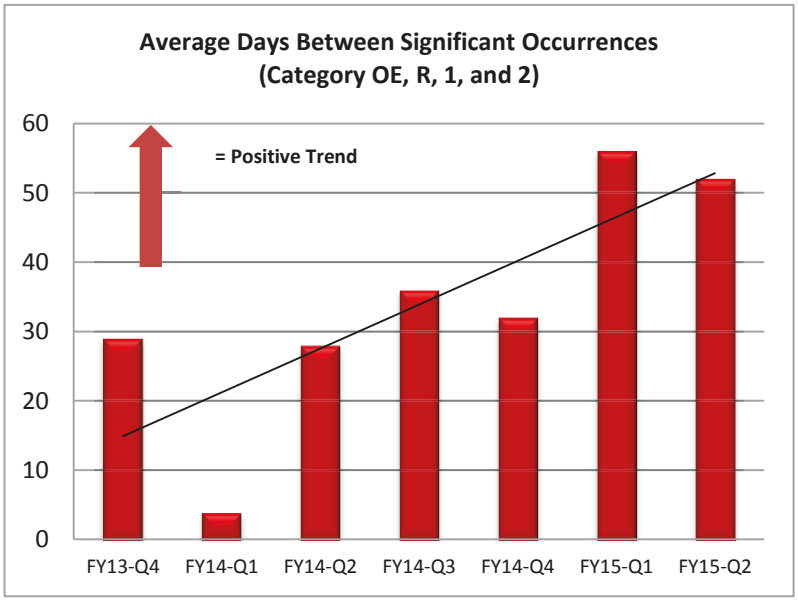
Over the past 24 months, the average number of days between significant occurrences is increasing, indicating that significant events are occurring less frequently. An increase in the number of days between significant events is a positive trend.

This quarterly analysis reviews those events that were reportable through ORPS, events that did not meet ORPS reporting thresholds, some conditions tracked in LabWay, the causes of reportable events, and trending performed by the INL Operational Performance Analysis Committee (IOPAC) group.

The report also provides a summary of the more significant Lessons Learned issued by INL.







INL Occurrence Trend Snapshots

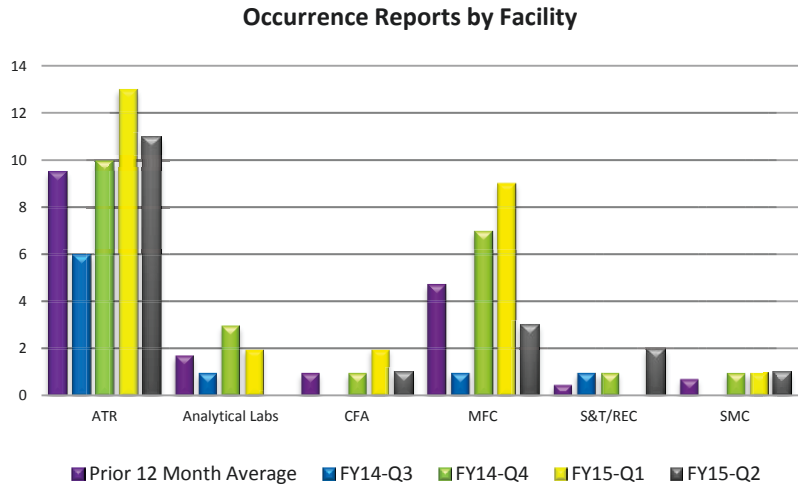
From 01/01/2015 through 03/30/2015, INL reported 18 new events to DOE, in accordance with DOE Order 232.2. These events were analyzed to determine commonalities related to: Operational Emergencies (Group 1), Personnel Safety and Health (Group 2), Nuclear Safety Basis (Group 3), Facility Status (Group 4), Environmental (Group 5), Contamination and Radiation Control (Group 6), Nuclear Explosive Safety (Group 7), Packaging and Transportation (Group 8), Noncompliance Notifications (Group 9), and Management Concerns (Group 10).

In addition, INL reported eight events and conditions through Initial Notification Reports (INRs) and INL's local issues tracking software (LabWay) that did not meet ORPS reporting thresholds. One of the eight events was reported as a Significance Category B condition in LabWay.

TREND SNAPSHOT

Occurrences by Facility: During the reporting quarter, all areas except STC/REC saw a decrease in the number of events reported. However, the average number of events this fiscal year, compared to the prior 12 month period for ATR, Materials and Fuels Complex (MFC), and Central Facilities Area (CFA) is higher. ATR reported 61% of the events during this reporting quarter and MFC 17%. Analysis of the nature and causes of all the reportable events is covered in additional sections of this report.

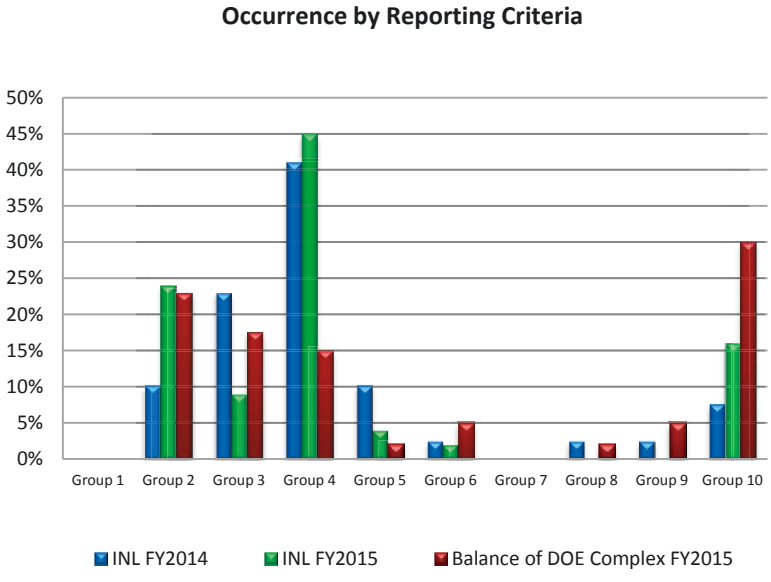
Additionally, the number of INRs submitted during the reporting period decreased from 34 last quarter to 23 this quarter.



TREND SNAPSHOT

Occurrences by Reporting Criteria:

During FY-15, INL has experienced the majority of events related to: Group 4, Facility Status (44%), Group 2, Personnel Safety and Health (24%), Group 3, Nuclear Safety Basis (9%), and Groups 10, Management Concerns (16%). Comparative analysis to the balance of the DOE complex is shown in the chart to the right and is explained in each section of the report that follows. The blance of the DOE Compelx reports the majority of events in Group 10 (30%), followed by Group 2 (23%), and Group 4 (18%).



SNAPSHOT

Lessons Learned Events: During the 2nd Qtr FY-15, the use of Lessons Learned through OPEXShare showed continuing improvement with many more employees signing up to receive Lessons Learned. Internalizing lessons learned (as indicated by responses entered into OPEXShare) show that INL organizations are using the lessons to improve operations at the Laboratory; active internalization increased from two in January to 20 in March. Some examples of active internalization include using lessons at meetings, incorporating lesson into work documents, and issuing the lesson as a required reading assignment.

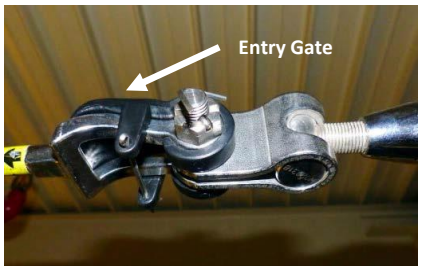
The INL Lessons Learned Program is an integral part of the feedback and improvement processes required by DOE. Operational excellence requires the use of internal and external operating experience information (OEI) to minimize the likelihood of undesirable behaviors and promote noteworthy practices. Lessons learned are systematically evaluated and implemented to continuously improve performance. INL embraces the philosophy that lessons learned are lessons applied.

During the 2nd Qtr FY-15, INL used internally generated and/or lessons shared from other sites to improve operations and learn from other's events or mistakes. Of this data, seven lessons were internally generated and entered into the INL database to be shared across the INL prior to migration to OPEXShare. The seven lessons shared by INL are summarized below:

Mechanic Exposed to Fall Hazard during Crane Preventive Maintenance

Lesson 2015-0007

ATR mechanics were performing preventative maintenance on the ATR Main Floor 40-ton overhead bridge crane. While a mechanic was inspecting the runway crane rail, approximately 40 feet above the main floor, the fall protection trans-fastener that rolls on the horizontal cable and connects the mechanic to the fall protection lifeline became detached due to a missing entry gate (the device designed to stop the trans-fastener from disengaging the horizontal lifeline). It was discovered that the Entry Gate was not installed and in place at the time of the event.



The mechanic involved was able to successfully reattach the trans-fastener to the horizontal lifeline and exit the crane rail without further incident, and immediately reported the condition to management. A stop work was put in place for all work that required the use of a horizontal or vertical lifeline system for fall protection until it could be verified that entry gates were in place. Some issues identified during the investigation showed that:

- Annual Inspections of the lifeline only included inspection for degradation, cable tension, trans-fastener operability, etc., as recommended by the manufacturer. Inspections did not check to ensure everything operated as designed.
- Each crane rail has one horizontal lifeline with one entry terminal body on each end for a total of four entry points. Neither lifeline contained the entry gates at the ends.

What Can We Learn: In order to prevent this from happening, it is important to conduct verification of horizontal and vertical lifelines and climbing systems to ensure that they are installed and operate correctly. Specifically, ensure that travel

stops/entry gates have been installed at terminal ends to prevent accidental disengagement of the personal fall arrest protective equipment (for example, the fall protection trolley). The photographs to the left illustrate the type of travel stop/entry gate installed on the system at ATR Complex, but configurations may vary. Consult the manufacturer, engineered drawings or vendor-supplied information to perform this verification.

This lesson was also shared with the DOE Complex through OPEXShare.

Core Drilling Results in Penetration of Electrical Conduit

Lesson 2015-0011

A subcontractor was working at MFC on an information technology upgrade in the Hot Fuels Examination Facility (HFEF). While core drilling through the HFEF Control Room wall, the drill operator noticed that the water backflow from his drill had stopped and the resistance against his drill changed. The drill operator stopped the drill and removed the bit from the wall. Upon inspection, it was discovered that a conduit within the wall had been penetrated. The conduit contained two 120 volt electrical conductors that provided power to a control room light switch. Further inspection determined that the insulation around the electrical conductors was not damaged. A subsurface evaluation was conducted that identified anomalies prior to work performance. Initial investigation of the event identified that the tool being used did not have a shunt trip device, as required by company procedure.

We learned that the subcontractor failed to adequately roll-down to their sub-tier employees the information in the company Requirements Document (RD) that required the use of a shunt-trip device when a double insulated tool is not used. In addition, a detailed work plan to explain associated hazards and how they will be mitigated was not generated, as required per the RD.

Interactions between the construction field representatives, supervisors, and safety personnel failed to identify the subcontractor's noncompliance to the requirement. Finally, the original scope of the work to be performed was considered low risk, but due to added work scope, the complexity, and risk in performing the new work scope increased and INL failed to assess the ability of the assigned supervisor to continue oversight for the higher risk work.

What We Can Learn:

- Personnel need to understand the importance of using shunt trip devices or double insulated tools when performing core drilling.
- It is essential that construction field representatives, supervisors, and safety personnel ensure all subcontract requirements are adequately flowed down to their contractors and sub-tiers, and that personnel are appropriately qualified and trained to the applicable Requirements Document.
- Superintendent qualifications should be reevaluated when additional work is added to the original work scope to determine if their qualifications and competence are adequate to provide the level of oversight needed for the increase in work scope.

Bent Stop Sign Shears during Repair

Lesson 2015-0005

MFC maintenance craftsmen were attempting to straighten a bent stop sign pole using a chain-fall and sling. During the process, the pole broke. The sign pole was made of steel and installed over an aluminum pole in the ground. A positive aspect of the job was personnel were instructed in a job briefing prior to performing the work, not to stand in the fall path of the pole while operating the chain-fall. No personnel were injured during this event and craftsmen immediately notified their foreman after the event occurred.

What Can We Learn: Conservative planning and evaluation of the job to understand hidden hazards is essential prior to performing work so that work can be performed safely. For this job, the pole should have been replaced instead of trying to bend it back into shape.

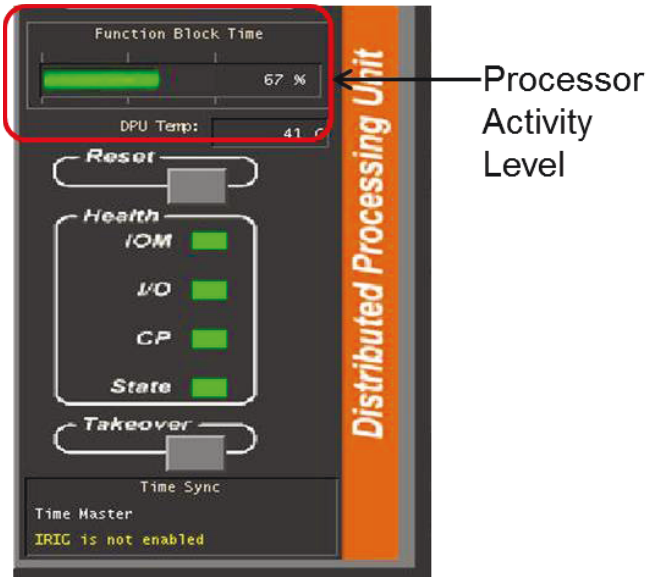
Processor Overload Leads to Reactor Scram

Lesson 2015-0006

On June 4, 2014, a reactor SCRAM occurred at the ATR due to a loss of control power to a SCRAM interface relay. The loss of

control power was likely caused by the control processor not maintaining the relay in a closed position, as a result of excessive processor activity. The excessive processor activity was due to the update interval (0.01 seconds) being too short for the number of configuration points being processed for the Loop 2B-SE processor. Some issues identified during analysis into this event include:

- The update interval being set at 0.01 seconds caused numerous errors indicating that configuration points were not being updated.
- Loop 2B-SE's configuration was changed after unacceptable time response testing was conducted to decrease the response time by setting multiple configuration points to use the 0.01 second update interval. The processor activity level was not checked after this change. If it had been checked, then the reactor SCRAM would have been prevented.
- The critical parameter's update interval for Loop 2B-SE processor was set to 0.01 seconds, a factory setting, compared to 0.04 seconds on four other processors on similar loops. If this difference would have been noted, the reactor SCRAM would not have occurred.



What Can We Learn: Process activity levels need to be monitored after changing settings to prevent processor overloading, which could cause critical errors. It is vital to review vendor default parameters to ensure proper settings to prevent unintended consequences.

Failure to Comply with Lockout/Tagout during Demolition

Lesson 2015-0006

An electrical lockout/tagout (LO/TO) was completed prior to demolition of selected plasma hearth systems at the Transient Reactor Test facility (TREAT). The following day, the shift supervisor noticed a criticality light had (incorrectly) been disconnected and removed as part of demolition. The light was originally included in the outage request, but later removed from the project. The light was also not included in the final approved LO/TO. While the light was not energized at the time of demolition, it did remain connected to a second separate circuit that would have been energized to 120 volts had a criticality alarm been tripped.

The approved demolition scope was recorded in the paperwork, but the final scope was communicated only verbally to the demolition team. The change in status of the criticality light was part of that verbal communication, but the subcontractor supervisor was not in attendance. Not aware of the change in scope, the subcontractor supervisor assumed the light was included in the project, had been tagged out, and told his electrician to remove the light. The electrician verified zero energy via proximity check and removed the light, not aware of the potential energized second circuit associated with the criticality alarm.

What We Can Learn: We learn that following written communication practices established in procedures is essential to consistent identification of approved work scope and workplace hazards. Key members of a work activity (i.e., supervisors, decision-makers) must be present for all scope walkdowns and be aware of changes to the original plan. Finally, when verbal methods are utilized to communicate changes in work activities, the communicator must verify understanding of the new expectations.

Continuous Air Monitor did not Perform as Expected

Lesson 2015-0001

On September 24, 2014, a Continuous Air Monitor (CAM) filter analysis report indicated higher than normal activity of airborne contamination levels. Low levels of alpha contamination were detected on four separate filters taken

from two CAMs operating in the MFC area. It was later determined, based on the CAM spectra, that the activity was from Americium (Am)-241. The detectable amounts were less than the CAM alarm set point but greater than the limit for establishing an airborne radioactivity area.

There were no CAM alarms in this area. No contamination was found on personnel, PPE, or equipment, as determined by routine surveys, direct scans, and large area wipes. Multiple reports of CAM poor-fit alarms in the facility had been viewed as maintenance trouble alarms.

What We Can Learn: Facilities that have source terms with multiple isotopes or changing radionuclide compositions should consider configuring the Alpha 7A as a region of interest CAM rather than selecting a few dose isotopes for measurement to minimize the risk of the CAM not performing as expected. Air filter analysis, using another instrument, should be conducted on air filters associated with maintenance and failure alarms on CAMs. Instruments running proprietary software should be evaluated with caution to identify limitations.

Why Lessons Learned Matter

Lesson 2015-0006

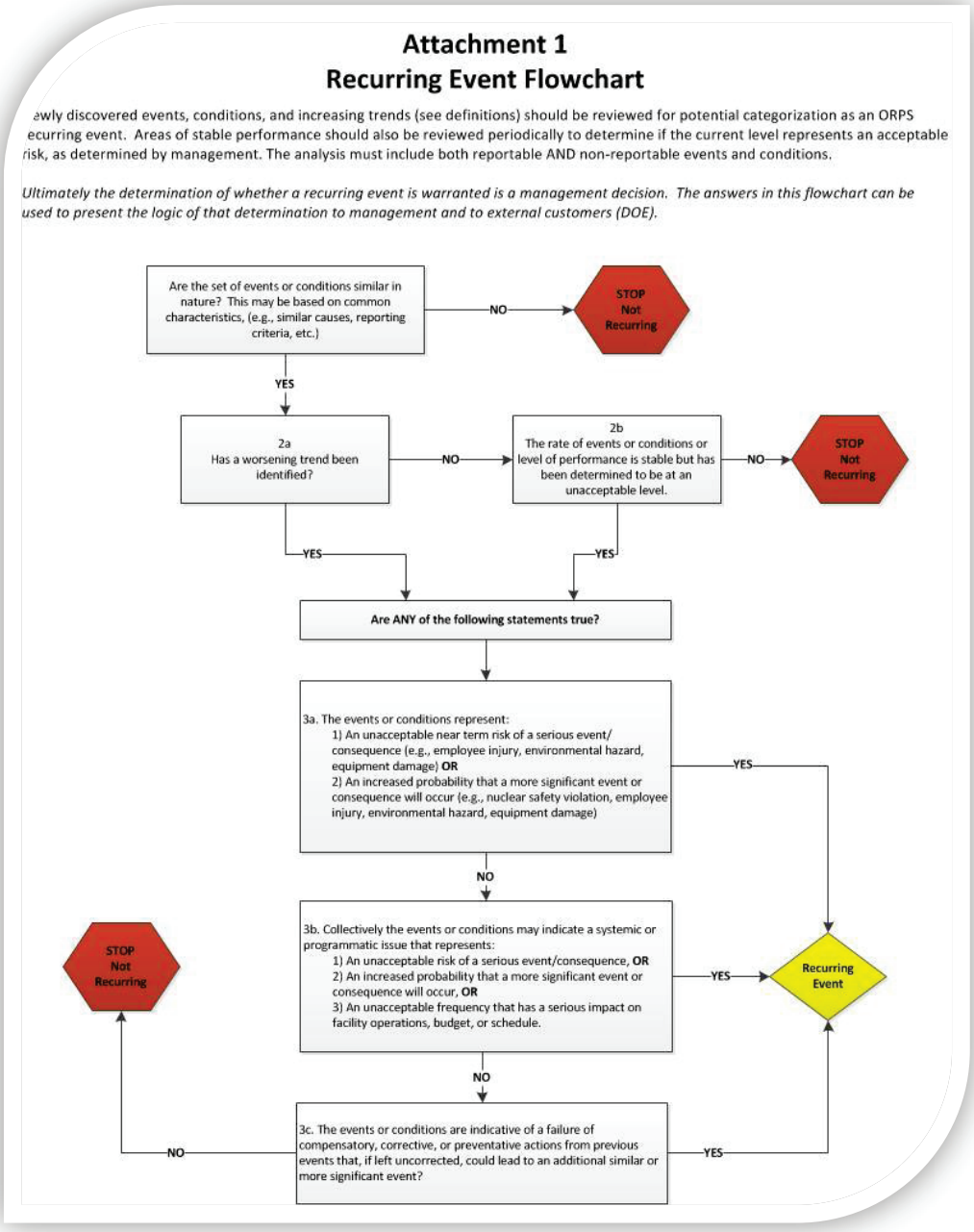
Slides from a training session, provided to work planners at INL, were shared with the balance of the Laboratory. Because planners are critical to the success of operations, it is important that they are knowledgeable of events that have occurred across the complex and that they know how to plan to prevent similar occurrences from happening at INL. The training focused groups role as seen from a success model, with a purpose of helping work planners understand what an event is, using real-world examples and how lessons learned can help prevent repetition of those events at INL.

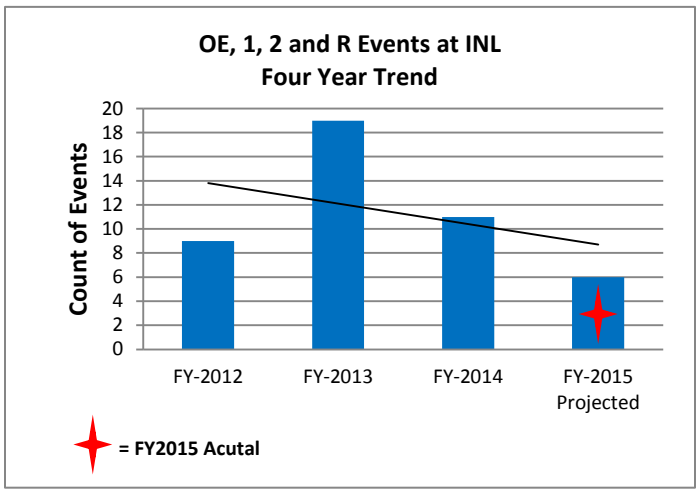
Planners were shown the ease of locating applicable lessons learned from OPEXShare and were provided an opportunity to register for OPEXShare and use the database.

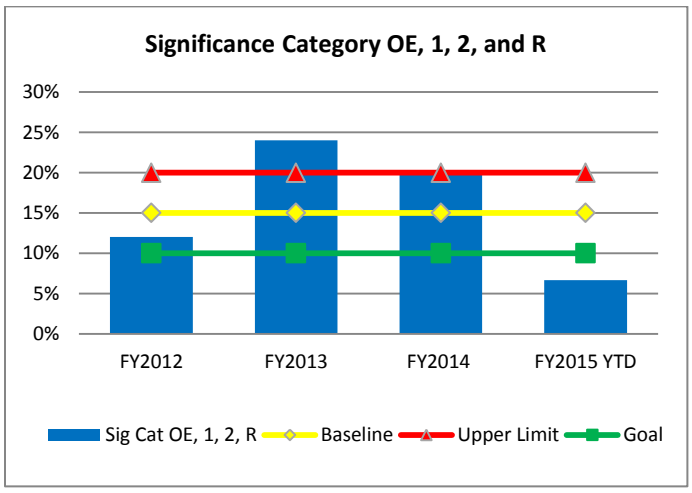
The ORPS Subgroup of the EFCOG Integrated Safety Management & Quality Assurance Working Group developed a worksheet and corresponding flowchart to help managers and program owners walk through a logical process to arrive at a conclusion on whether an event or condition is recurring or not recurring.

A pilot of this process began in the 1st Qtr FY-15 and concluded on March 10, 2015. Comments from the pilot were collected and INL will adopt the process and incorporate it into an existing procedure or guide. This guide is expected to be completed before the end of the 3rd Quarter FY-15.

In the meantime, INL managers, the ORPS Program Lead, and Assurance personnel throughout the Laboratory continue to use the information in the guide to assess events and conditions for recurrence. So far, no recurring events have been identified.







INL established a set of performance metrics to monitor events by their significance. The measures compare INL events to those reported at other facilities within the DOE complex. Baseline data was derived from complex-wide reporting of 5,630 events in the ORPS database between 2009 and August 2014. INL's goal is to experience a downward trend in the number of Significance Category OE, 1, 2, and R events occurring at INL. INL's performance metrics are as follows:

Green: Less than 10% of the events reported at INL are significant (OE, Sig Cat, 1, 2, or R); **Yellow**: Greater than 10% and less than 20% of the events reported at INL are significant (OE, Sig Cat 1, 2, or R); and **Red**: Greater than 20% of the events reported at INL are significant (OE, Sig Cat, 1, 2, or R) Control Limits are for Significance Category OE, 1, 2, and R events were set at +10% of baseline.

Additionally, INL monitors events by significance category to determine if INL reporting is consistent with reporting at other DOE facilities.

As shown in the first chart to the left, INL is experiencing a downward trend in the number of significant events (Sig Cat OE, 1, 2, and R) occurring at the INL over the past four years. If the current rate continues through the Fiscal Year (see bar titled FY-2015 Projected), INL will again see fewer significant events than reported last fiscal year.

During FY-13 and FY-14, INL reported a greater percentage of significant reportable events (Sig Cat OE, 1, 2, and R), as compared to other DOE facilities (see next chart). However, FY-15 data shows the INL to be below our goal of less than 10% of events reported at INL as significant events.

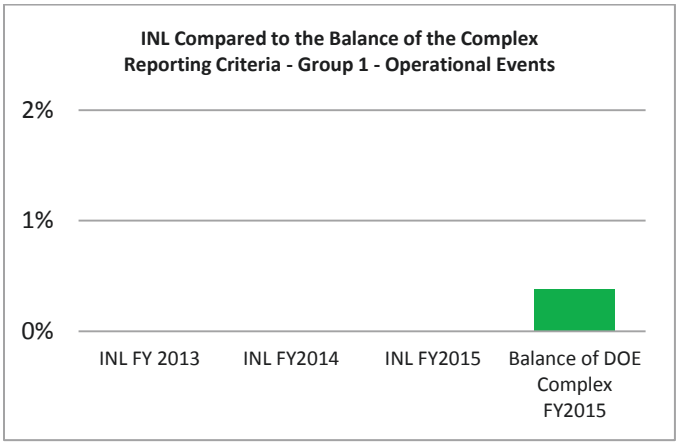
In addition, The INL is experiencing a slightly lower percentage of Significance Category 3 events than those experienced throughout the rest of the complex, and, during the 1st quarter FY-15, 74% of INL reportable were categorized as Significance Category 4 events. This is higher than the complex average of 42%.

Analysis on how INL measures up to the balance of the complex in each of the reporting criteria groups is provided throughout this report.

2nd Qtr FY-15 GROUP 1 – OPERATIONAL EMERGENCIES

There were no operational emergencies reported during the 2nd quarter of FY-15. The last operational emergency was reported in April 2012, when boron triflouride gas leaked from a neutron detector (NE-ID-BEA-INLLABS-2012-0003). The rate of occurrences of operational emergencies continues to trend at zero.

When compared to the balance of the DOE complex, the rate of occurrence of these types of events at INL is consistent with those reported elsewhere. So far in FY-15, two Operational Emergencies were reported throughout the DOE Complex, equating to less than ¼ of a percent of the total events reported. The INL is consistent with the rest of the DOE Complex in that none (0%) of INL events were reported in the Group 1 reporting group.

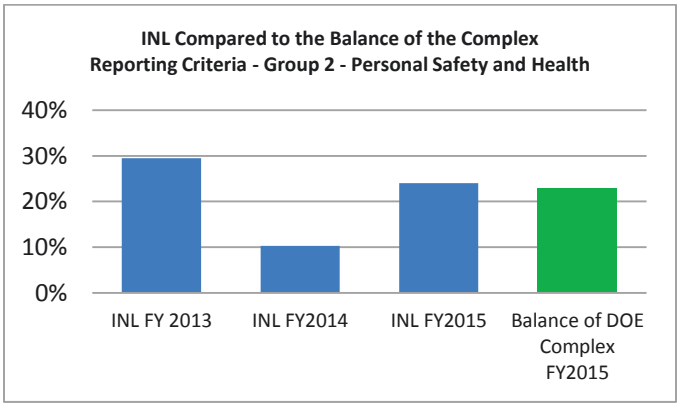


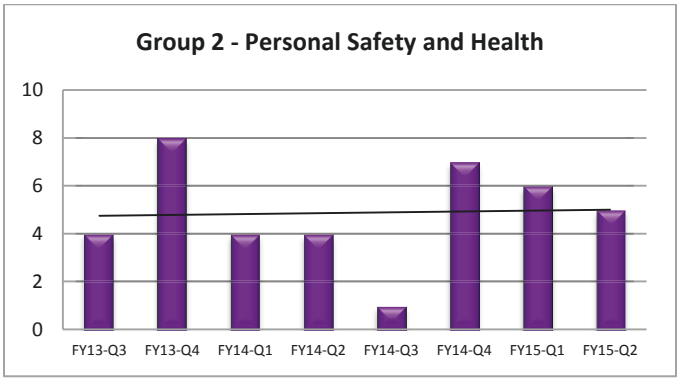
2nd Qtr FY-15 GROUP 2 – PERSONNEL SAFETY AND HEALTH

TREND SNAPSHOT

Personnel Safety and Health Events: During the 2nd Qtr FY-15, five events occurred that were related to personnel safety and health (e.g., occupational injuries, occupational exposures, fires, explosions, or hazardous energy) and were communciated to DOE through ORPS. Three additional events were reported via INRs or directly into LabWay that did not meet the ORPS thresholds, but were related to criteria in this reporting group. The rate of occurrence of reportable personnel safety and health events is trending slightly upwards following two consecutive quarters (4th Quarter FY-14 and 1st Quarter FY-15) of a high number of events in this reporting group.

When compared to the balance of the DOE complex, the rate of occurrence of Group 2 events at INL was consistent with those reported elsewhere in the complex during FY-15. In FY-15, 24% of INL's reportable events were reported under Personnel Safety and Health criteria. In comparison, 23% of those reported across the DOE complex fell into this reporting group.





The five reportable events categorized under the personnel safety and health reporting criteria and the three

non-reportable events reported during the 2nd Qtr FY-15 are summarized below.

Personnel Injury Due to Slip on Ice

NE-ID--BEA-ATR-2015-0005 (Significance Category 3)

An ATR employee, exiting the ATR Guard House, slipped and fell due to accumulation of ice on the walkway. The employee suffered a fractured rib as a result of the fall. An investigation into the event found that the pathway where this incident occurred has very low ambient lighting making it difficult to readily see ice accumulation on the sidewalk. Additionally, the sidewalk from the guard gate to the reactor building was replaced during the Fall of 2014. In addition, the slope of the walkway in this particular area did not meet the specifications defined in 36 CFR 1191-ADA.

What We Can Learn: This event underscores the advantages of implementing the ISM system prior to installation and during inspection of new structures, such as the sidewalk. It is also indicative of how we should be ever mindful of changing conditions and how they may affect a simple task such as walking to our office. Having the fundamentals of human performance behaviors can ensure that we do not fall victim in error-likely situations.

Individual Entered 2A Primary Cubicle without Signing on to Lockout/Tagout

NE-ID--BEA-ATR-2014-0011 (Significance Category 4)

An ATR Radiological Control Technician (RCT) entered the 2A primary cubicle on the morning of February 25, 2015, without signing in on the primary cubicle entry LO/TO. The LO/TO was in place to protect personnel from electrical hazards that exist inside the cubicle. At the time of the event, all electrical hazards were properly controlled and zero energy verifications had been satisfactorily completed for this work several days before the event. All isolation components remained locked in the required position and no personnel were exposed to any hazardous energy source. An analysis into the event found the RCT failed to use Operating and Maintenance Manual (OMM)-3.15.3.2.17, General Loop Cubicle Entry procedure for entering the primary cubicle.

What We Can Learn: Attention to detail must be maintained at all times and personnel should be ever aware of their responsibilities and the work requirements with which they are expected to comply.

Protective Grounds Removed Prior to Clearance Release being Requested by Subcontractor

NE-ID--BEA-CFA-2015-0001 (Significance Category 4)

INL Power Management personnel and a subcontractor were performing work under their own respective work order and subcontract on March 5, 2015. The work required an outage on 13.8 kV electrical distribution circuit. To support the work, two separate clearances had been issued, one in support of the Power Management work and the other for the subcontractor. Power Management personnel had installed ground clusters earlier in the week to support the work being performed by the subcontractor. Additional ground clusters were installed by Power Management, on the day of the event, in preparation for the work that they were to be performing. The two sets of ground clusters were installed in close proximity to each other as some work was being performed nearby by both entities. As Power Management completed their work, their work package directed them to remove their ground clusters. The clusters providing protection for the Power Management work were removed and, in addition, Power Management personnel removed the ground clusters that had been placed in support of the work being performed by the Subcontractor.

On March 5, 2015, as the subcontractor was preparing to remove the ground clusters they had personally placed, they noticed that the Power Management ground clusters that had been installed for their work activity, had already been removed, which is contrary to PMMP-3508 (Clearances and Work Permits). The Subcontractor Superintendent notified the Construction Field Representative who relayed the concern to the BEA's Construction Safety Engineer and Construction Manager on the morning of March 9, 2015. The construction safety engineer immediately issued a work stoppage.

What We Can Learn: Personnel must always ensure they understand the status of the work in progress, especially when their actions could affect the safety of others.

Employee Slip Results in Fracture

NE-ID--BEA-INLLABS-2015-0001 (Significance Category 3)

On December 17, 2014, an employee was leaving the Energy Innovation Laboratory (IF-688) to attend a meeting in another building and stepped on ice, ice melt or other interference and fell to the ground. The employee was taken to the INL medical dispensary for evaluation. Injuries to the right hand, right knee and right ribs (all bruised) where identified, x-rays revealed no broken or fractured bones. The employee was released to return to work with restrictions (right hand use as

tolerated and walking as tolerated). Employee followed up with medical, after INL work curtailment, on January 7 reporting continued pain in the right wrist. Follow up x-rays showed a fracture.

What We Can Learn: Winter in Idaho is always associated with an increased risk of slips and falls. Employees can minimize the chances of injury if they wear proper footwear, walk carefully, and spread ice melt on areas where ice has accumulated.

Failure to Follow a Hazardous Energy Control Process

NE-ID--BEA-SMC-2015-0001 (Significance Category 4)
A Construction Field Representative (CFR) entered an Equipment Operation Zone (EOZ) for a production line at the Specific Manufacturing Capability (SMC) without following the approved process for such entry. EOZs are protected by engineered safety devices such as light curtains and pressure mats that provide hazardous energy controls when entry is needed during normal production operations. These devices do not provide protection for servicing and maintenance - which is governed under the Lockout/Tagout (LO/TO) program - but the devices and associated controls are part of the established hazardous energy control program at SMC. The individual was stopped by the Nuclear Facility Manager, who directed him to exit the EOZ.

What We Can Learn: This event also stresses the need to pay attention and to be aware of the requirements for working in specific areas at INL.

Other Non-Reportable Events

There were two additional non-reportable events related to personnel safety and health reported in LabWay during the 2nd Qtr FY-15. The events are as follows:

CO-2015-1382
An employee was inspecting equipment and materials in the back yard of IF-685, Energy Systems Laboratory (ESL). The equipment and materials were staged awaiting excess or disposal. The employee was inspecting some of the equipment, in preparation of a scheduled walk-down with the Environmental Subject Matter Expert (SME) to determine additional requirements for the disposal process.

While moving through the piles of equipment and materials, an instrument shipping box tipped or fell against the right leg of the employee. The employee was wearing pants and leather, 12 inch high steel toe safety boots. The instrument box was sitting on a blue tarp and may have had a pallet or some other object underneath the tarp that caused it to be unstable. The box tipped over against the right leg of the employee, dragging down along the right side of the calf. The employee grabbed the box and moved it away from his leg. Feeling mild discomfort, the employee inspected his leg and noted that there was a scrape and it was bleeding slightly, although there was no tear or puncture in the pant material. The employee believes that one of the two interlocking lid locking mechanisms on the box were responsible for the injury.

CO-2015-0910
On the morning of February 9, 2015, an employee was entering the rear passenger seat of a car at IF-606, INL Administration Building (IAB), to go to a work meeting. As the employee was entering the vehicle, the driver started moving. The employee's left leg was in the car and the vehicle's movement caused the employees left leg to twist and their right hip to strike the car. The employee sought medical evaluation at the Willow Creek Building (WCB) Dispensary, where a physician assistant determined the employee had strained their left knee and right hip. The employee was given hot/cold therapy and released to return to work with restrictions. The employee was directed to return to Medical for a follow-up and directed to seek offsite medical evaluation.

What We Can Learn: This event was the result of a loss of situational awareness and of not focusing on the correct tasks. The driver should have ensured all passengers were safely inside the vehicle before putting the vehicle in gear.

ANALYSIS FOR RECURRING EVENTS:
Personnel safety and health occurrences were the second most frequently reported event type, accounting for 18 reportable events in the last 12 months. Five of the events resulted in personnel injury; three from slips, trips, or falls. Two injuries occurred during movement of a heavy piece of equipment. Although there were some similarities in the slips (for example, two occurred on icy surfaces), none of the personnel injuries were found to be recurring.

Five of the events were the result of an unexpected discovery of an uncontrolled hazardous energy source (either electrical or other source). Three of the events (1) failure to establish a LO/TO on the Plasma Hearth Project, (2) failure to use a LO/TO on an argon supply line, and (3) an electrical ground fault that occurred during cleaning of an extrusion press, all occurred at MFC. One of the last two events occurred at ATR and was related to a broken street light cable at the ATR Complex. The final event was at SMC. This event was

reported following discovery of uncontrolled hazardous energy during a pre-job to replace a controller for an air handling unit. Analysis of these events did not find them to be recurring.

Nine events were the result of a failure to follow a prescribed hazardous energy control process. The nature of these events varied and included discovery of an improperly fastened hasp on a lock box, expiration of LO/TO qualifications, failure to document LO/TO training for escorted personnel, connection of a power panel without proper hazardous energy controls, and the removal of a piece of equipment that was under the protection of a LO/TO by a person not on the LO/TO.

An increase in lapses in situational awareness was discussed in the February IOPAC meeting as a potential emerging theme. Data was analyzed and presented to the IOPAC and the INL Operations Council in March.

The data showed that, in comparison to the same time period last fiscal year, reportable injuries occurring in CY-15 could be much higher than previous years, if the current trend continues. As a result of the analysis, a sub-team was tasked to develop a safety share or spotlight training class to use at staff meetings.

Time Period	Minor Injury Cases	First Aid Cases	Recordable Cases	DART Cases
2015 FY YTD	5	34	18	7
2014 FY – Feb	2	30	15	5

Situational awareness is an ever-present factor in many injuries, so it is difficult to definitively identify a "spike" specific to situation awareness. Additionally, because there is no way to ever eliminate the loss of situational awareness from a work task, preventing its recurrence is impossible.

Analysis of events reported under the ORPS Group 2 – Employee Safety and Health criteria did not identify any recurring themes or problems.

2nd Qtr FY-15 GROUP 3 - NUCLEAR SAFETY BASIS EVENTS

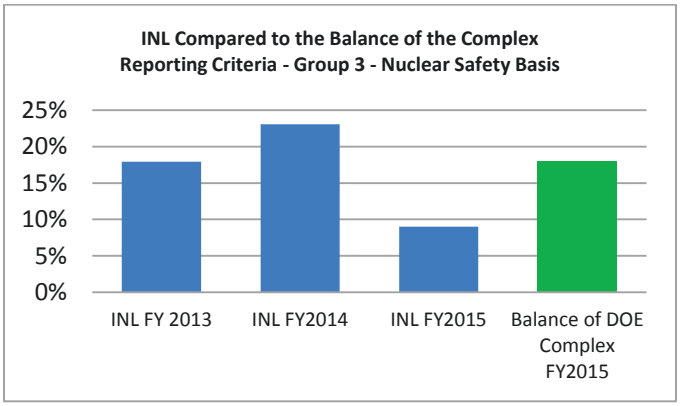
TREND SNAPSHOT

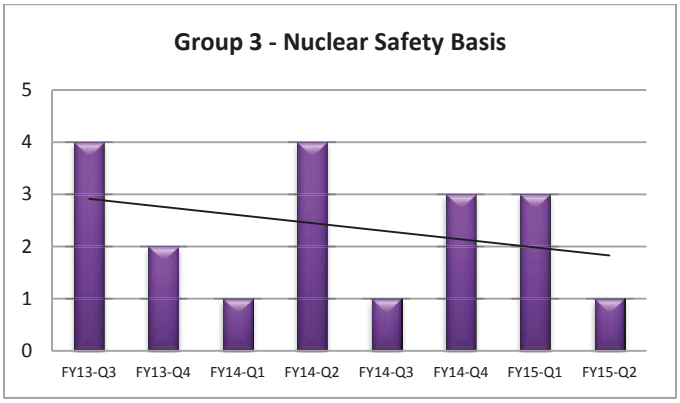
Nuclear Safety Basis Events: One nuclear safety basis event was reported in the 2nd Qtr FY-15. The rate of occurrence of nuclear safety basis events continues to tend downward over the past two years. During the past 12 months, eight events have been reported under this criteria; all of which were identifed at ATR and all were the result of determination of a positive positive unreviewed safety question (USQ). **An analysis of the six ATR positive USQs events did not reveal any commonalities. Discovery of the conditions has been the result of increased rigor in evaluating existing safety analysis at ATR and identifying legacy problems with the analyses.**

When compared to the balance of the DOE complex, INL has reported a lower percentage of events under the Group 3 - Nuclear Safety Basis criteria than the rest of the complex. As reported last quarter, the events reported at INL are not unexpected and are attributed to increased rigor in assessing safety of the ATR. This rigor is in response to lessons learned from the Fukushima accident in Japan and attributed to hiring a new group of safety engineers with a fresh set of eyes. Currently in FY-15, 9% of INL's reportable events were reported under Nuclear Safety Basis criteria compared to 18% across the DOE complex.

The number of events reported under the Nuclear Safety Basis criteria is trending downward over two years. In FY-15,

Nuclear Safety Basis events have been the fourth most frequently reported event type at INL, accounting for one reportable event this quarter, and eight in the past 12 months. The one event reported during the 2nd Qtr FY-15 is summarized below.





Declaration of a Positive USQ Concerning Fueled Experiment Storage in the ATR In-Pile Tubes

NE-ID--BEA-ATR-2015-0007 (Significance Category 2)

On February 5, 2015, a Potential Inadequacy of the Safety Analysis (PISA) was declared concerning fueled experiment storage in the ATR In-Pile Tubes (IPTs). Consequence analyses currently cited within Safety Analysis Report (SAR)-153, which calculate the dose consequence associated with IPT loop loss of coolant accidents (LOCA), credit the actuation of the radiation monitoring and seal system (RMSS). As such, the analyses assume operability of RMSS and the isolation of the ATR confinement, and the resulting mitigation of airborne radioactivity.

However, Technical Safety Requirement (TSR)-186, Limiting Condition of Operation (LCO) 3.2.2 and 3.8.1, states that the RMSS actuation system and confinement shall be operable during power operation and for 30 minutes following power operation. Therefore, a release of radioactive material, resulting from a loop LOCA may not be mitigated by the RMSS and confinement, if it occurs beyond the operability period of 30 minutes post shutdown and the fueled loop test still has a large enough decay heat to melt in air. As such, the RMSS and confinement operability period required is not adequate to mitigate all postulated test failures and may invalidate the operability assumption made within the consequence analyses. At the time of discovery, the reactor was shut down and installed fueled loop experiment irradiation had not started for the current operating cycle.

What We Can Learn: This event underscores the need for rigorous review of analysis contained in safety basis documents. The use of previously performed analyses in existing documented safety analysis as the basis for new qualitative analysis must be approached with the proper level of review and questioning attitude along with validation of methods and assumptions used in the previous analyses.

Other Non-Reportable Events

There were no additional non-reportable events related to nuclear safety basis problems documented in LabWay during the 2nd Qtr FY-15.

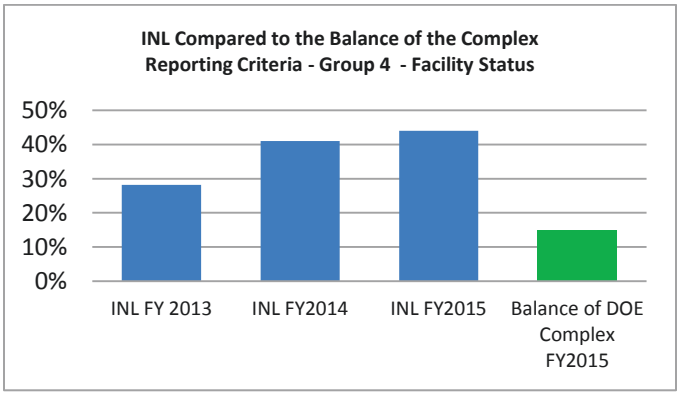
ANALYSIS FOR RECURRING EVENTS:

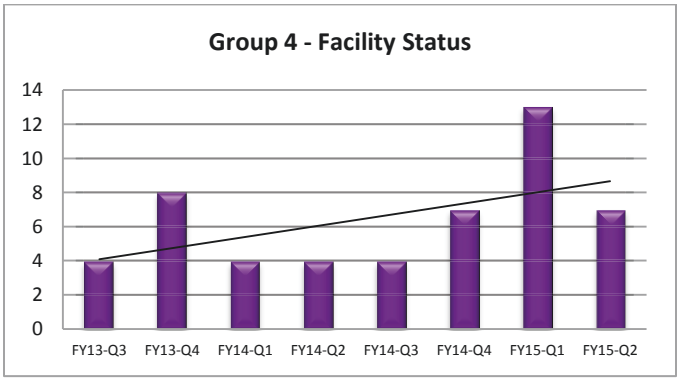
As stated above, the events reported at INL are not unexpected. The increased discovery of reportable nuclear safety basis events is directly attributed to increased rigor in assessing safety of the ATR, following the Fukushima accident in Japan. Analysis of events reported under the ORPS Group 3 – Nuclear Safety Basis criteria, did not identify any recurring themes or problems.

TREND SNAPSHOT

Facility Status Events: Facility status events accounted for 39% of the events reported in the 2nd Qtr FY-15 and 44% of the events reported fiscal year to date. The number of events reported under this criteria dropped nearly in half from last quarter (from 13 to 7); however, the rate of occurrence of facility status events continues to trend upwards over the past two years. During this quarter, five events at ATR were attributed to a performance degradation of a safety class or safety significant structure, system, or component when the system was not required to be in operation. Two events at MFC were related, due to a less than adequate actuation of a fire alarm sytem. Thirty-one events have been reported at the INL, under this reporting criteria, over the past 12 months. ATR reported 20 of these events, MFC reported ten, and SMC reported one.

The percentage of occurrence of Group 4 events at INL is higher than that of the balance of the DOE Complex (44% vs 15% in FY-15) and has been steadily increasing since FY-13.





Events related to facility status have been the most frequently reported event type, accounting for 31 reportable events in the past 12 months. During the second quarter of FY-15, there were five events reported under criteria 4A(2) – Performance degradation of any Safety Class Safety Significant Component (SSC), when it is not required to be operable. These five equipment problems were found during the ATR reactor turnaround when maintenance activities are taking place to prepare the reactor for restart.

The seven events reported under the Group 4 – Facility Status criteria during the 2nd Qtr FY-15, are summarized below.

ATR Solenoid Valve 6-1008 Leaking Air

NE-ID--BEA-ATR-2015-0003 (Significance Category 4)
On January 17, 2015, an ATR Senior Reactor Auxiliary Operator (SRAO) heard air flow noise in the vicinity of the stack dampers solenoid valves enclosure. Upon inspection, the SRAO discovered solenoid valve (SV)-6-1008 leaking air from its vent port. SV-6-1008 is a 4-way solenoid valve for Backup Damper Motor (BDM) 1-5A, which supplies air (with nitrogen backup) to shut BDM-1-5A, when required. The damper is part of the RMSS and allows for monitoring and configuring the ATR ventilation system, based on radiological conditions in the plant.

At the time of discovery, the ATR was shut down and defueled for Cycle 157C-1 outage; therefore, TSR-186, LCO-3.22, and LCO-3.8.1, for confinement, were not applicable. The event was attributed to equipment degradation.

ATR #3 Deepwell Protection Relay Lost Memory

NE-ID--BEA-ATR-2015-0004 (Significance Category 4)
On January 26, 2015, the Utility Area Supervisor notified ATR management that the protection relay installed on the breaker for #3 deepwell had an error code on it, preventing the deepwell to start. Investigation revealed the relay experienced a loss of memory due to a loss of power. The relay gets its power from the #3 deepwell diesel installed in

the outer area, because of an extended shutdown of the ATR, the diesel has not been run in approximately five months. With no power to the relay, the internal power supply (battery/capacitor) lost charge, causing the loss of the set points. A Maintenance Work Request was initiated to reprogram the MP-3000 protection relay.

What We Can Learn: Extended outages can create additional unforeseen problems. Long duration outages should be evaluated for adverse impact to equipment, such as the relay in this event.

ATR Firewater Pump 663-1 Failed Battery Charger

NE-ID--BEA-ATR-2015-0006 (Significance Category 4)
On February 2, 2015, a "battery charger #1 failure" alarm was received on the controller for the building TRA-633 #1 firewater pump (633-1). Investigation revealed the #1 battery was internally shorted and needs replaced. The control switch for 633-1 was placed in the off position and a work request was initiated.

ATR South Safety Rod Failed to Fully Insert During Shutdown

NE-ID--BEA-ATR-2015-0008 (Significance Category 4)
During a manual scram to shut down the ATR, the south safety rod did not fully insert. The rod stopped at 6.5 inches. The ATR has six safety rods that provide shutdown reactivity. The ATR TSR-186, LCO 3.7.1 requires that the Calculated Total Worth, N-1 RODS must be greater than or equal to $6.4. For the operating cycle, the LCO requirement was met with five operable safety rods. Additional procedure steps to insert the safety rod during the shutdown were taken and the south safety rod remained at 6.5 inches.

Each operating cycle, an analysis is performed to ensure that the reactor will be able to be shut down, assuming that one of the operable safety rods fails to insert from the fully withdrawn position. For this cycle, five of the six safety rods were required to be operable.

ATR Canal East Short Bulkhead Seal Leak

NE-ID--BEA-ATR-2015-0010 (Significance Category 4)
The ATR Lead Senior Reactor Auxiliary Operator (LSRAO) reported finding an air leak from the canal east short inflatable bulkhead seal during visual inspections and operator rounds in the canal area. The seal pressure had not changed from a previous reading and pressure readings for both seals on the bulkhead were within limits.

ATR TSR-186, LCO- 3.5.5, PISA, ATR Complex-USQ-2010-741, interim controls and Technical Evaluation (TEV)-284, Evaluation of the Safety of the Situation for ATR RTC-USQ-2008-451, requires that irradiated fuel elements in canal storage must be protected against potential canal draining accidents. Part of the protection provided to the irradiated elements in storage is to have isolation bulkheads installed in the canal with dual inflatable seals. Since heavy equipment lifts are not normally performed on the east end of the canal, the east short bulkhead is not required to be in service continuously. The east short bulkhead is needed only when heavy equipment lifts are done in that area or if a canal leak were to develop on that end of the canal. Cask handling and other heavy equipment lifting evolutions in the ATR canal were not taking place when the seal leak was noted.

Fire Alarm Actuation was Less Than Adequate

NE-ID--BEA-MFC-2015-0001 (Significance Category 4)
On January 5, 2015, MFC Balance of Plant (BOP) personnel discovered that the water flow alarm for building MFC-791, the Instrument and Maintenance Facility, did not actuate an alarm at the INL Alarm Center when a local water flow alarm was received the day prior. On January 4, 2015, at 1945 hours, a BOP technician was informed by security that there was water in the basement of building MFC-791.

Upon inspection, it was found that water was flowing from a fire water system pipe located in the northwest corner of the facility. The local water flow alarm had actuated. Then on January 5, 2015, while performing a follow-up to the water

flow alarm, it was discovered that while the local alarm actuated, the INL Alarm Center did not receive a water flow alarm as is expected. The failure of notification to the INL Alarm Center prevented immediate facility or off-site emergency response and resulted in the event being categorized as reportable. The fire water was isolated to the facility and a fire water impairment was implemented with a two-hour fire watch.

Actions were initiated to resolve discrepancies on the Alarm Center and MFC fire alarm panels. Additional actions were taken to install temporary heating in the facility and plans were initiated to install permanent heating before next winter.

What We Can Learn:

- Ensure that work orders are implemented and performed on at-risk systems prior to the winter season.
- Areas where potential freezing can occur need to be promptly mitigated with temporary heating and communicated to management for permanent fixes.
- Freeze protection checks in facilities need to be constantly evaluated to ensure adequate controls are in place to prevent freezing.

Fire Alarm Actuation was Less Than Adequate

NE-ID--BEA-MFC-2015-0002 (Significance Category 4)
On February 6, 2015, Transient Reactor Test (TREAT) Facility personnel believed that the TREAT fire alarm system Universal Digital Alarm Communicator Transmitter (UDACT) dialer failed, resulting in the inability to promptly notify the CFA Alarm Center in the event of a fire at TREAT. Upon further investigation of the failure, it was learned that the UDACT did not cause the problem, but a failed phone line was responsible. Life Safety System (LSS) personnel switched to a spare operable phone line and successfully completed testing of the fire alarm system from TREAT to the INL Fire Department.

Other Non-Reportable Events

There were four additional non-reportable events related to facility status reported during the 2nd Qtr FY-15. These events are as follows:

CO-2015-0934
During ATR reactor operation, the 2D helium (He) system experienced water intrusion, an apparent increase in experiment loop leak rate, and a significant increase in radiation levels at the 2D He accumulators. ATR was manually scrammed on February 15, 2015, at 0839, as a result of the event. Subsequent pressurization testing revealed no leakage of He into the pressure tube, nor did any ultrasonic signature changes materialize. After a post-job review with the Experiment Engineers, it is believed that the flaw is likely small. Following additional evaluation and coordination with Maintenance, Production Control, and Bettis, a path forward will be established for gathering information to optimize the NDE/DE activities.

CO-2015-0018
A fire water flow alarm was activated at building TRA-666A on January 2, 2015. The INL fire department and ATR Operations personnel responded to the alarm. The fire department inspected the building and then cleared it when no signs of water, smoke, or fire were found. The cause of the flow alarm was unknown. Operations personnel discovered that the heating system in Lab 103 was not working and the temperature was 36˚F at the fume hood in the northwest corner of the room. A portable electric space heater was placed in Lab 103, the fire water to the building was isolated, and a two hour fire watch was established.

Several hours later, while performing the fire watch duties, a Utility operator discovered a one inch raw water line in Lab 103 on the east wall by the fire riser, had ruptured and was leaking. The water to the lab was isolated. The following day, Laboratory, radiological control and operations personnel met at TRA-666A, to discuss cleanup efforts when they discovered a one inch water line in the northwest corner of Lab 103 had ruptured and was leaking above a lab hood. The water line to Lab 103 was isolated to stop the leak. Access to the affected labs was restricted at the entry doors until sampling and cleanup efforts could be completed. Radiological surveys at the boundaries (lab doors) were taken and were found to be below the reporting limit. Additional sampling was performed and the results indicated that all beryllium wipe samples were below the DOE release criteria of 0.2 ug/100cm^2 and the air sample collected was below the LOQ.

What We Can Learn: An investigation and apparent cause analysis into this event found that a preventative maintenance activity did not exist to ensure that the batteries for the heating and ventilation thermostats were replaced on a periodic basis, as recommended by the manufacturer. Additionally, the operator rounds failed to identify the non-conservative approach to monitoring the facility during extreme weather conditions. Monitoring the temperature of the TRA-666 high bay area and checking that the exhaust fans were operational – without ever entering TRA-666A – would not ensure the building's internal environment was such that freezing would not occur.

CO-2015-0006

During 480 volt diesel uninterrupted power supply (UPS) system operability testing to transfer the diesel bus source from commercial power to 674-M-6, the M-6 diesel generator frequency and voltage became unstable. After 674-M-6 was supplying 670-E-3 and disconnected from commercial power, the operator performing the transfer attempted to make final adjustments to the diesel generator output voltage. This adjustment appeared to have induced a generator feedback condition from which the diesel engine and generator control circuitry was unable to recover.

Generator frequency (i.e., engine speed) began to oscillate between 58 and 62 Hz while occasionally dipping below and climbing above that band and output voltage was as well not controllable. Under the direction of the System Operability (SO) Test Director and the LSRAO, the operator adjusted frequency and voltage in an attempt to stabilize the diesel generator. The LSRAO then went to observe the diesel and reported audible surging in generator speed as soon as he exited Building 670. At the same time, the SO Test Director went to the laydown area to check the status of the UPS units. The UPS units were in an asynchronous condition with intermittent Bypass Mains Fault Alarms.

It became apparent that condition was not going to be recoverable via DOP-7.5.3, Section 5.13, and the decision was made to secure 674-M-6 diesel generator. When the generator was secured, the UPS transitioned to battery only mode while maintaining power to 670-E-9 without interruption. 670-E-3 Breaker 17 was then shut to reenergize 670-E-3 from commercial power. The UPSs then transferred back to normal mode and were left in that condition. A system operability test is planned to assure system functionality.

CO-2015-0099

On January 10, 2015, an ATR LSRAO found an air leak on a fitting that supplies the ATR canal west short bulkhead seal (System #1). The seal is safety related equipment providing protection to irradiated fuel in the canal. A request to repair the fitting was issued.

ANALYSIS FOR RECURRING EVENTS:

Facility status occurrences were the most frequently reported event type, accounting for 31 reportable events in the last 12 months and 20 in the current fiscal year.

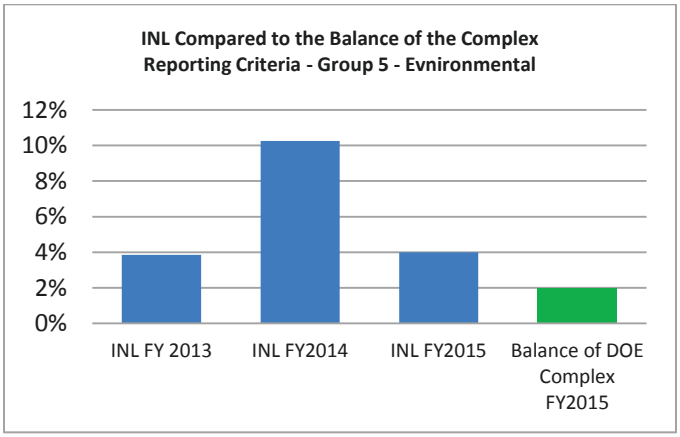
Sixteen of the events in the past 12 months were the result of degradation of a safety class or safety significant component when the equipment is not required to be operable. All 16 of these events were discovered at the ATR facility. These events were discovered during maintenance activities, in preparation for the reactor restart. Many of the events occurred because frequent foot traffic to the facility caused degradation of the door seals and latches. Additional problems were discovered because extended shutdown of equipment resulted in loss of backup battery capabilities.

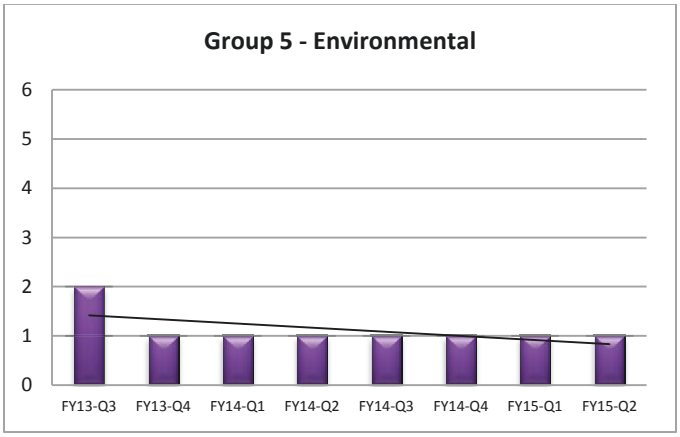
A review of the events, by both ATR management and by the ORPS program lead, found no recurring issues.

TREND SNAPSHOT

Environmental Events: There was one environmental event reported in the 2nd Qtr FY-15. The rate of occurrence of environmental events is trending downwards.

When compared to the balance of the DOE complex, the percentage of occurrence of Group 5 environmental events reported at INL is slightly higher than that of the balance of the DOE Complex (4% to 2% during FY-15). All four of the environmental events reported in the last year are related to 40 CFR Part 63, Subpart ZZZZ (also known as Quad Z) requirement changes.





The one event reported in the 2nd Qtr FY-15 is described in the following column.

Quarterly Report of Diesel Engine Startup at the Advanced Test Reactor (ATR)

NE-ID--BEA-ATR-2015-0001 (Significance Category 4)

New environmental regulations, operation, and maintenance requirements for ATR Complex diesel engines are in effect: 40 CFR, part 63, subpart ZZZZ, National Emissions Standards for Hazardous Air Pollutants for stationary reciprocating Internal Combustion Engines (RICE).

The following ATR Complex engines are non-emergency stationary RICE: Generators 670-M-42, 670-M-43, and 674-M-6. Without installation of emissions controls, units 670-M-42, 670-M-43, and 674-M-6 do not meet the new emission standards for hazardous air pollutants that went into effect on May 2, 2013. INL has negotiated with the Idaho Department of Environmental Quality (DEQ) a Voluntary Consent Order (VCO) to replace units 670-M-42 and 670-M-43 with a commercial power based UPS. When the UPS project is complete in 2015, all three units will be designated as emergency stationary RICE.

Other Non-Reportable Events

There were no additional non-reportable events related to environmental problems reported during the 2nd Qtr FY-15.

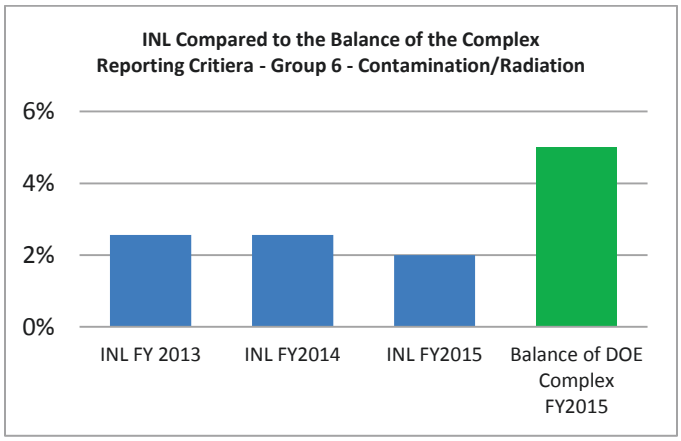
ANALYSIS FOR RECURRING EVENTS:

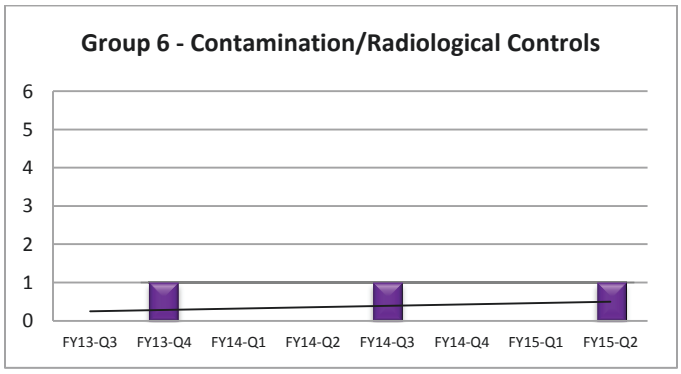
Although the event reported this quarter is exact in nature to each of the other three events reported in the past 12 months, it is not indicative of an adverse trend or recurring problem, but is the result of changes to 40 CFR Part 63.

TREND SNAPSHOT

Contamination/Radiation Events: There was one reportable event related to contamination/radiation control reported in the 2nd Qtr FY-15. The new event caused the rate of these types of events to trend slightly upwards over the past two years. However, during the last 12 months, only two reportable event were reported in ORPS. There was also one non-reportable event documented this quarter.

Two percent of the events reported at INL during FY-15 were reported under Group 6 Contamination/Radiation criteria. The balance of the DOE complex reported 5% of events under the same criteria. Previously reported events at INL included discovery of radioactive particles at ATR and several events at MFC, including the plutonium contamination event in the Zero Power Physics Reactor (ZPPR). Since these events, added rigor to radiological work has paid off and is seen as a reduction in the number of radiological events.

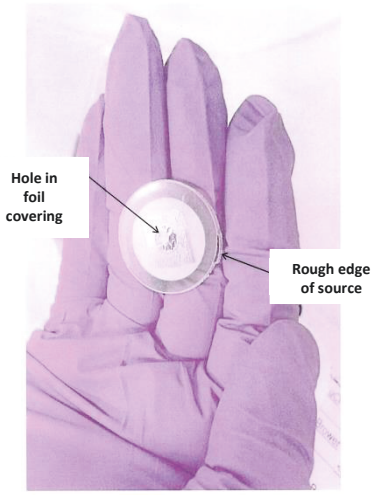




Events related to contamination and/or radiation control are some of the least reported event types at INL; these events have only accounted for two reportable events in the past 12 months. There was one reportable event in the 2nd Qtr FY-15. That event is summarized below:

Discovery of a Leaking Radioactive Source

NE-ID--BEA-HFEF-2015-0001 (Significance Category 2)
Radioactive contamination was discovered outside of a controlled area at the Hot Fuel Examination Facility (HFEF) on March 11, 2015. During a survey to release a Carbon 14 sealed source from the facility, an RCT discovered 69,000 disintegrations per minute (dpm) beta gamma contamination on the source and 2,376 dpm beta gamma contamination on the inside of the source container. The source was being controlled in a radioactive source storage locker in radioactive materials area, but not in a radiological buffer area for contamination control.



An investigation into the discovery found that the edges of the Carbon 14 source cartridge were protruding, causing a tight source fit inside the source holder. The tight fit required the handler to use a push rod (provided by the vendor) to remove the source from the holder. Over time, the continued use of the push rod caused a failure in the foil covering the Carbon 14 source.

What We Can Learn: Users of similarly constructed sources should understand that they can be very flexible. If they do

not fit properly inside the provided source and a push rod is necessary to remove them, periodic inspections of the source foil should be done to ensure the foil is not being damaged by the rod.

Other Non-Reportable Events

CO-2015-0072

On January 7, 2015, during performance of reactor pre-startup checks, the CAM located in the Advanced Test Reactor Critical (ATRC) reactor room alarmed, causing an evacuation of the ATRC facility. Operators entered Key-Off Shutdown mode, evacuated the facility, in accordance with facility evacuation procedures, and notified Radiological Controls and Operations management. Air samples were obtained, re-entry was made, and the facility was surveyed and determined to be free of contamination. Subsequent examination of the CAM revealed indications of a failure and the alarm was determined to be false. A replacement CAM was installed in the facility. The ATRC was not operating at the time of the alarm and no radiological work was in progress.

Update on MFC-704 FMF Suspect Contamination Found on CAM Filters

NE-ID--BEA-FMF-2014-0001

The planned Advanced Fuel Cycle Initiative (AFCI) glovebox testing activities have been completed. Based on the results of the tests, no positive conclusion for the cause of the contamination on the CAM filters has been identified. However, there are air sample results that would indicate possible areas of potential low level air activity release. The test team recommended that further examination of these possible points of release should be explored to determine or rule out if they contributed to the source of release. Any new status regarding this event will be provided next quarter.

ANALYSIS FOR RECURRING EVENTS:

There have been two reportable events under the Radiation/Contamination reporting criteria the past 12 months. One occurred this quarter, as described above, and a second (a skin contamination event at the MFC Analytical Laboratory) occurred in the 3rd Qtr FY-14. In addition to the non-reportable event this quarter, one additional non-reportable event occurred at the HFEF in July 2014, involving movement of a waste container from the Decontamination Cell to the Hot Repair Area and resulted in higher than expected radiation readings and the Fuel Manufacturing Facility (FMF) CAM filter event (reported under Group 10 criteria) occurred. There were no commonalities in these events and analysis of the events identified no adverse trend or recurring problems.

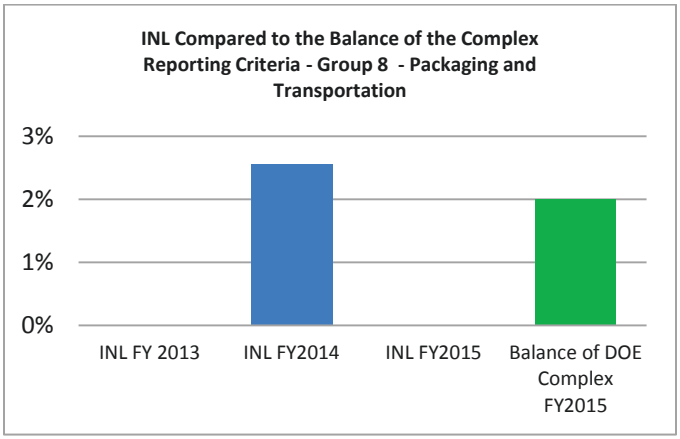
2nd Qtr FY-15 GROUP 7 – NUCLEAR EXPLOSIVE SAFETY EVENTS

There were no events related to nuclear explosive safety during the 2nd quarter FY-15. BEA has never reported an event under this reporting criterion since taking over the contract for the Laboratory in 2005. Of the 231 events reported across the DOE Complex during the 2nd quarter of FY-15, none were reported under the Group 7 – Nuclear Explosive Safety Events criteria.

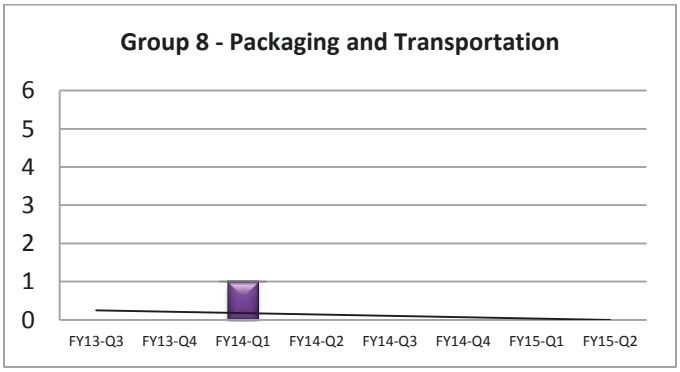
TREND SNAPSHOT

Packaging and Transportation (P&T) Events: There were no reportable packaging and transportation events during the 2nd Qtr FY-15. The two year trend data for these types of events shows a decreasing trend. Over the past 12 months, there have been no P&T-related reportable events documended in ORPS.

INL rarely reports events under Group 8 P&T criteria. As compared to the balance of the DOE Complex, 2% of all reportable events documented in ORPS, during the FY-15, were related to P&T.



Events related to packaging and transportation rarely occur at INL; the last reportable packaging and transportation event occurred in the 1st Qtr FY-14.



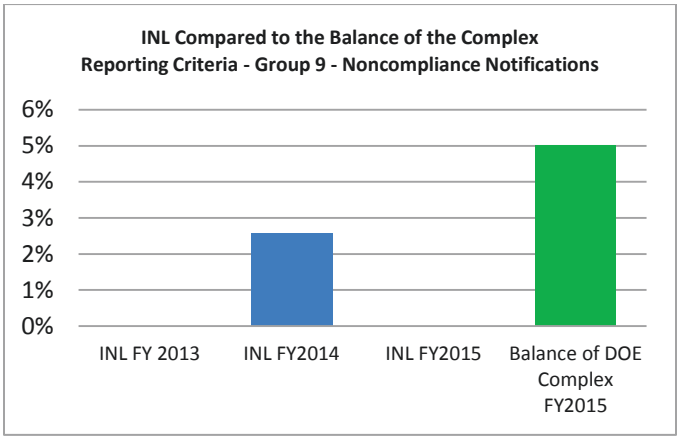
An event involving tritium sample shipments from the Safety and Tritium Applied Research (STAR) facility was reported this quarter as a management concern under Group 10 reporting criteria.

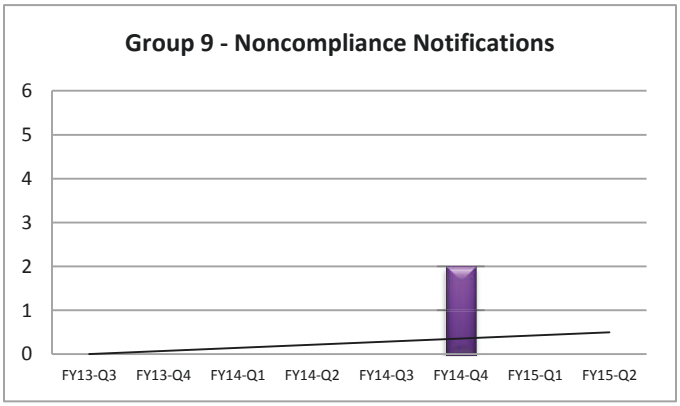
ANALYSIS FOR RECURRING EVENTS:
There is no indication of an adverse trend or recurring problems associated with P&T activities at INL.

TREND SNAPSHOT

Noncompliance Notification Events: Noncompliance notification events are reported when the INL receives written notification from an outside regulatory agency that the site or an INL facility is considered to be in noncompliance with a schedule or requirement. Over the past 12 months, the INL has been issued two noncompliance notifications and has reported them through ORPS. Both of these were reported during the 4th Qtr FY-14. There were no events reported under this criteria during the 2nd Qtr FY-15. The two year trend data for these types of events shows a slight increase trend because of the events reported in FY-14.

Five percent of the events occurring during FY-15, throughout the balance of the DOE Complex, were reported under this reporting criterion.





Other Non-Reportable Events

There were no additional non-reportable events related to noncompliance notifications reported during the 2nd Qtr FY-15.

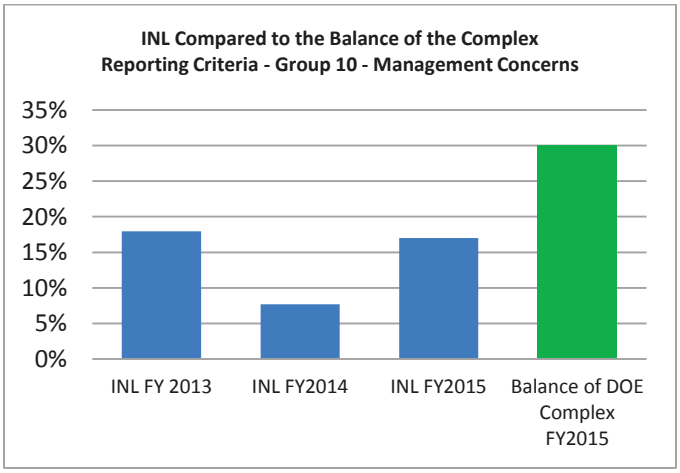
ANALYSIS FOR RECURRING EVENTS:

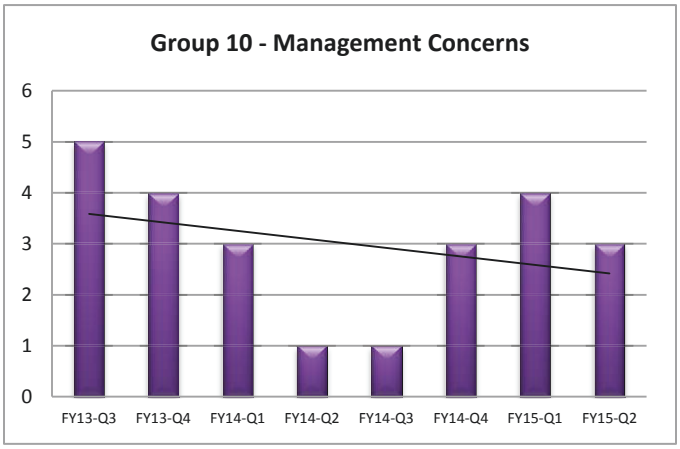
As stated in previous quarterly reports, there is no indication of an adverse trend or recurring problems associated with noncompliance notification reportable events at INL.

TREND SNAPSHOT

Management Concerns and Issues: Three events were reported during the 2nd Qtr FY-15, under reporting critiera for a management concern or issue. All three were reported as near misses to an otherwise ORPS reportable event. The rate of occurrence of reportable management concerns is trending downward over the past 12 months. During the past 12 months, INL has reported eight events under Group 10 management concerns.

The balance of the DOE complex reported 30% of all events, so far in FY-15, under Group 10 Management Concern criteria. In comparison, INL has reported 17% of all events under Group 10 reporting criteria.





The three events reported during the 2nd Qtr FY-15 are summarized in the following column.

Worker Exposed to Fall Hazard During Crane Preventive Maintenance at the ATR

NE-ID--BEA-MFC-2015-0009 (Significance Category 3)
This event has already been summarized in the Lessons Learned section, but is being repeated here for reporting consistency.

ATR mechanics were performing preventative maintenance on the ATR Main Floor 40-ton overhead bridge crane. While a mechanic was inspecting the runway crane rail, approximately 40 feet above the main floor, the fall protection trans-fastener that rolls on the horizontal cable and connects the mechanic to the fall protection lifeline became detached, due to a missing entry gate (the device designed to stop the trans-fastener from disengaging the horizontal lifeline). It was discovered that the entry gate was not installed and in place at the time of the event.

The mechanic involved was able to successfully reattach the trans-fastener to the horizontal lifeline and exit the crane rail without further incident and immediately reported the condition to management. A stop work was put in place for all work that required the use of a horizontal or vertical lifeline system for fall protection until it could be verified that entry gates were in place. Some issues identified during the investigation showed that:

- Annual Inspections of the lifeline only included inspection for degradation, cable tension, trans-fastener operability, etc., as recommended by the manufacturer. Inspections did not check to ensure everything operated as designed.
- Each crane rail has one horizontal lifeline with one entry terminal body on each end for a total of four entry

points. Neither lifeline contained the entry gates at the ends.

What We Can Learn: In order to prevent this from happening, it is important to conduct verification of horizontal and vertical lifelines and climbing systems to ensure that they are installed and operate correctly. Specifically, ensure that travel stops/entry gates have been installed at terminal ends to prevent accidental disengagement of the personal fall arrest protective equipment (for example, the fall protection trolley). The photographs on Page 24 illustrate the type of travel stop/entry gate installed on the system at ATR Complex, but configurations may vary. Consult the manufacturer, engineered drawings, or vendor-supplied information to perform this verification.

Safety & Tritium Applied Research Facility Sample Shipment

NE-ID--BEA-MFC-2015-0012 (Significance Category 3)
In July 2014, nine samples were taken from a ventilated enclosure at the STAR facility at the ATR complex for the purpose of being sent to an offsite laboratory for analysis. Two of the samples exceeded the acceptance limits for the offsite Industrial Hygienist (IH) laboratory and had to be sent to a different offsite environmental laboratory. A cost estimate was completed for shipping and analysis of the two remaining samples and was provided to the Principal Investigator (PI) who decided to hold the samples until funding could be secured for analysis.

In early March 2015, funding was secured and the PI notified the IH at the STAR facility the two remaining samples could be shipped and analyzed. The IH contacted various personnel including P&T and Regulatory & Monitoring Services to ship and analyze the two samples. A series of ineffective communications occurred between these organizations and the term “good to go” was not defined and, as a result, misunderstood.

The samples were turned over to a contractor to package and ship to an offsite laboratory for analysis. Shortly after the handoff of the samples, the RCT read through an email chain and identified a communication disconnect. The term “good to go” was used in the email chain and was referring to the fact that a contract was in place for shipment and was not intended to communicate that the samples had been screened and were ready to ship. The samples were returned to ATR, where the P&T form was completed, resulting in the package not being Department of Transportation (DOT) regulated. Since the samples did not exceed DOT regulatory limits, they could have been shipped as is without any changes to the labeling or packaging. An investigation into the event found that less than adequate communication and understanding of roles and responsibilities caused the near miss. Some issues that were identified include:

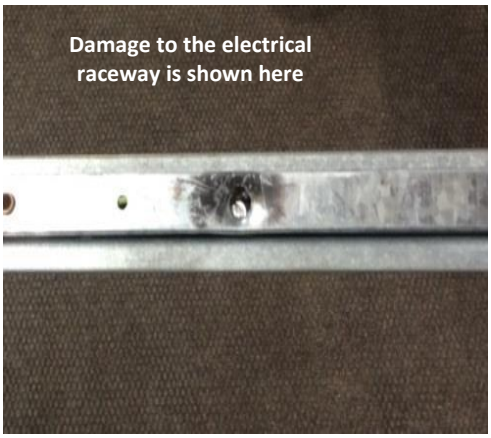
- Significant time lapse from sample collection in July to the time of this event in March resulted in a change of personnel who were not knowledgeable with the sample history, contributing to ineffective communication turnover.
- The beryllium/tritium samples were collected by a researcher for characterization purposes. The IH correctly determined that these two samples had activity levels in excess of what the IH laboratory could receive. This resulted in a change to the normal IH process. From that point forward, the roles of who was completing each activity between IH, P&T, and Regulatory & Monitoring Services were not well defined.
- In this instance, the Regulatory & Monitoring Services subcontractor was being used for only the shipment and analysis of the samples verses the normal full turnkey process from collection to analysis. The deviation from the process led to a misunderstanding of roles and responsibilities.
- The IH was trying to facilitate shipment to a laboratory and contacted P&T, but was not directed to fill out the P&T shipment form 580.40.
- The P&T personnel checked to see if the subcontractor had a valid contract in place that resulted in a “good to go” from a contractual perspective, but not as to whether the shipment form had been completed.

What We Can Learn: When situations outside the normal process are encountered, it is especially important to ensure that effective two-way communication is being used and that the roles and responsibilities for each individual supporting a project are thoroughly understood. Use of existing procedures from start to finish ensures that roles and responsibilities are well-defined and understood.

Electrical Arc Due to Partition Adjustment

NE-ID--BEA-STC-2015-0002 (Significance Category 3)
On March 4, 2015, at INL's Engineering Research Office Building, an electrical arc occurred during a routine carpet replacement activity. Workers had placed a jack under a partition wall to lift the partition approximately one inch above the ground, in order to remove the carpet from under the wall. When the partition was lifted, the workers heard a loud pop. They stopped work and notified their line management.

The investigation determined the worker had inadvertently positioned the lifting device directly under a bolt head passing through the partition wall electrical raceway. The weight of the partition caused the bolt head to pass into the raceway compromising the conductor insulation. This resulted in an electrical short, as evidenced by a mar on the electrical raceway and on the surface plate of the jack



What We Can Learn: Carpet replacement is a routine activity that has been performed in a similar manner for many years without incident. Neither the workers nor the work planners recognized the hazard or the importance of the placement of the jack since the hazard had never been identified and, as a result, had never been addressed in any work documents. Additionally, not all partitions are energized via an electrical raceway at the bottom of the panel. Newer partitions have the bottom raceway while older ones did not.

This event could have been avoided if proper hazard review of routine activities had been completed and the appropriate tools and training were made available to the workers. As a result of this event, work orders were reviewed and updated and partition jacks, developed by industry for this specific process, were purchased. Training on the proper use of the jacks was provided to the workers.

Other Non-Reportable Events

There were no additional non-reportable conditions that are being addressed as management concerns.

ANALYSIS FOR RECURRING EVENTS:
During the past 12 months, there have been eight additional events that did not meet ORPS reporting criteria thresholds but were reported as management concerns or were categorized as near misses to a more significant event. Six reported as not meeting thresholds were:

- ATR Enters LCOs Due to Operator Inadvertently Placing Utility UPS in Bypass Mode
- Experiment Loop 2E-NW Pressurizer Heater Leg Piping Leak at the ATR
- Alpha Contamination Outside of a Hood
- MFC-704 FMF Suspect Contamination Found on CAM Filters
- LO/TO Inadequacies
- CFA-623, Malfunction of Equipment

Two reported as near miss events (see Lessons Learned) were reported this quarter for a description of the near miss events):

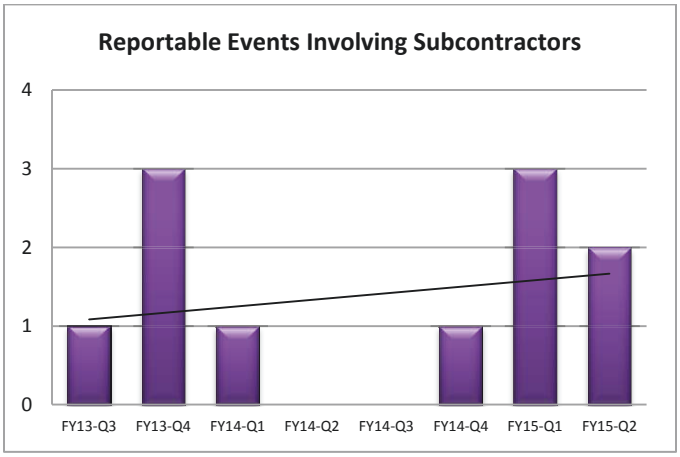
- Conduit Damaged During Core Drilling Activities
- Stop Sign Pole Snaps While Being Straightened

After analyzing the events for common problems and similarities, there is no indication of an adverse trend or recurring problems associated with any of the events being reported as management concerns over the last 12 months.

2nd Qtr FY-15 EVENTS INVOLVING SUBCONTRACTORS

TREND SNAPSHOT

Events Involving Subcontractors: Two events involving subcontract employees occurred during the 2nd Qtr FY-15. The number of reportable occurrences involving subcontractors is trending upwards following three events last quarter and two events this quarter. During the 2nd quarter FY-15, 11% of INL's reportable events involved subcontractors. In comparison, 14% of events occurring throughout the balance of the DOE complex involved subcontracted personnel.



There have been six ORPS reportable events involving subcontractors during the past 12 months. This quarter, the removal of the protective grounds event (reported under NE-ID--BEA-CFA-2015-0001) and the movement of the office partitions (reported under NE-ID--BEA-STC-2015-0002) involved subcontract personnel.

ANALYSIS FOR RECURRING EVENTS:
The events of the past year were reviewed for similarities; none were identified. One subcontractor had been involved in three of the six events during the last 12 months; however, this subcontract was not at fault in all of the events. There is no indication of an adverse trend or recurring problem associated with any of the events involving subcontract personnel that have occurred over the last 12 months.

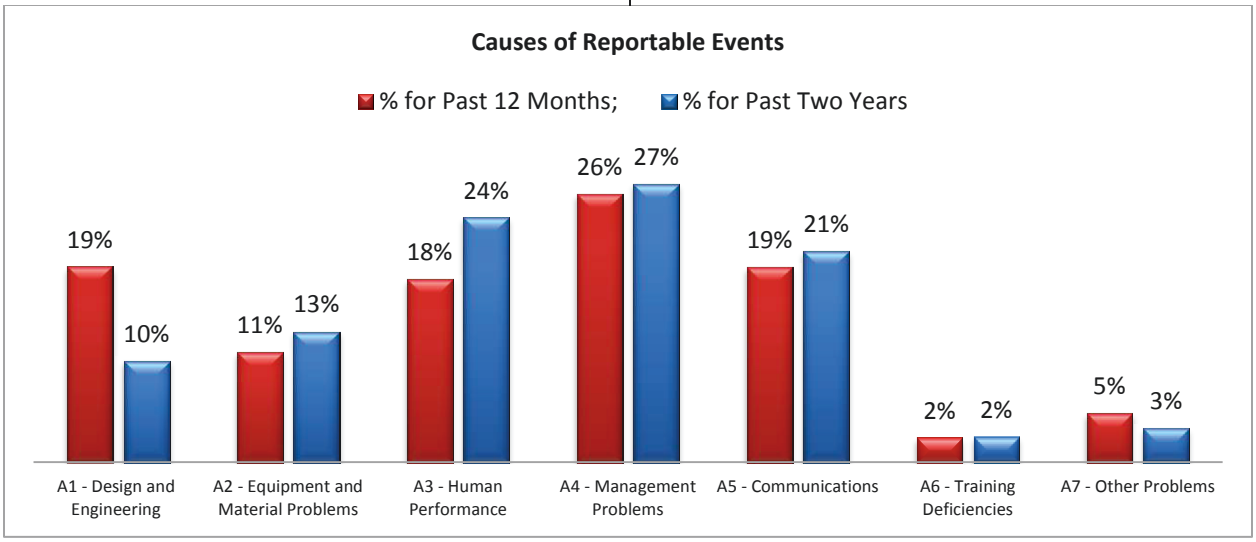
2nd Qtr FY-15 ANALYSIS OF CAUSES OF REPORTABLE EVENTS

Cause codes documented in ORPS were analyzed through ORPS distribution trend reports to get an understanding of what is causing or contributing to events at INL. The data was reviewed to determine causes over the past year and the past two years. The analysis shows that the majority of causes over both time periods can be attributed to management, human performance, and communications. This is similar to the data being compiled and analyzed monthly by the IOPAC team.

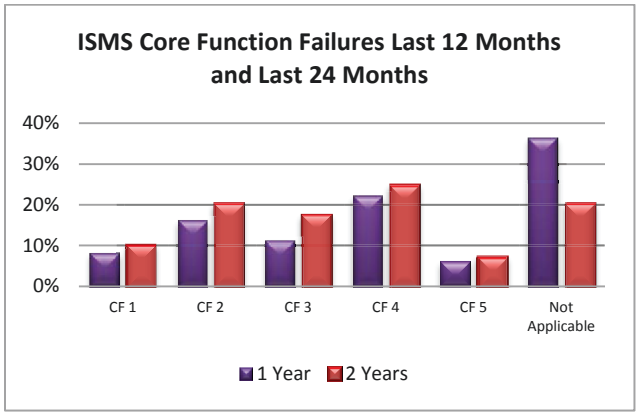
The percentages of events caused, in part, by management, by less-than-adequate human performance, and by less-than-adequate communications are dropping, when compared to the percentage reported two years ago. This decline is indicative of successful mentoring and oversight achieved by having management spend time in the field, watching work and addressing incorrect behaviors before they lead to events. INL expects more improvement in these areas as the new management observation program, which places greater emphasis on coaching and mentoring, is rolled out across the Laboratory.

Analysis of reportable events identified an increase in problems associated with design and engineering (A1 cause codes). Many of the equipment problems were discovered during turnaround activities at the ATR and, as stated earlier

in this report, the events are not indicative of repetitive problems or adverse trends. The following chart shows the trending of reportable events by cause code.



In addition to evaluating the cause of events, INL analyzes each reportable event to identify where we failed to effectively implement the five Integrated Safety Management System (ISMS) core functions. The chart below shows all reportable events that have occurred over the past two years and the past one year at INL and their corresponding ISMS core function failures.



- CF1 – Define the Scope of Work
- CF2 – Identify the Hazards
- CF3 – Develop and Implement Hazard Controls
- CF4 – Perform Work Within Controls
- CF5 – Provide Feedback and Continuous Improvement

Over the past year, 36% of the reportable events indicated no known failures of the ISMS process. This includes equipment problems and discovery of suspect counterfeit parts. Twenty two percent of the events indicated problems with of Core Function 4 – Perform Work within Controls. While this is a decrease from the two year comparison, these metrics are being monitored to ensure INL is effectively implementing the ISMS program.

The INL Management Observation Program has been enhanced so that it can enable safe, secure, efficient, and effective work performance through regular, purposeful, and documented management presence, where and when employees perform work. This is achieved by management personally observing work activities and communicating with employees to solicit input and provide mentoring, coaching, and timely feedback on behaviors. This program strengthens application of Core Function 4.

TREND SNAPSHOT

IOPAC Trending Analysis: For the 2nd Qtr FY-15, the INL mission centers [ATR, MFC, SMC, National and Homeland Security (N&HS), Nuclear Science and Technology (NS&T), Energy and Environment Science and Technology (EES&T), Facilities and Site Services (F&SS), and Laboratory Protection (LP)] continued to evaluate ORPS events, INRs, and LabWay conditions for trending and comonalities. Analysis from the Radiological Controls Management System, the INL Work Management System, and Conduct of Operations were also presented by the IOPAC to INL Senior Management. Issues common across the INL and issues that continue to affect the INL are summarized below.

The IOPAC meets monthly to discuss actions being taken at the Laboratory Mission Centers and share lessons across the Laboratory. The IOPAC team has been working on actions to address the following:

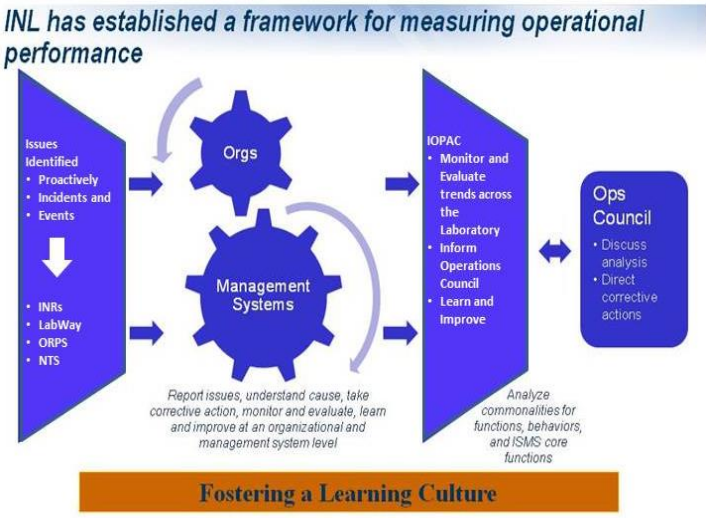


Figure 1. Framework for Measuring Operational Performance

- Increasing management field presence throughout the Laboratory, through mentoring and a structured Management Observation Program.
- Continued improvement with management of legacy issues (those older than 200 days) has been noted. Both the average age of open conditions and total population of open conditions continue to increase. Long-term conditions are being assessed to determine if they meet established guidelines.
- The IOPAC identified a potential trend regarding the loss of situational awareness and an increased rate of accidents. This potential trend, regarding a noted increase in the lapses of situational awareness, and the actions taken to address it are described on Page 13 of this report.
- The IOPAC did not did not identify any recurring problems within any one mission center or throughout the Laboratory.

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INL Quality and Performance Management Expectations

INL has a vision to change the world's energy future and secure our critical infrastructure. INL's mission is to discover, demonstrate and secure innovative nuclear energy solutions, other clean energy options and critical infrastructure. Quality and Performance Management plays a critical role in supporting the INL mission. Our mission is to:

- Ensure we as a Lab know how we are doing and are improving our performance.
- Own and manage the Laboratory Issues Management System.
- Provide high quality QA program support for research and operations.
- Provide effective independent oversight.

"In order to be successful, we must be leaders, we must be competent, and we must be accountable. We must also exhibit the INL values of excellence, integrity, ownership, and teamwork."
– Chris Hott, Director – INL Quality and Performance Management

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