FY2017 1st Quarter INL/EXT-17-40995

IDAHO NATIONAL LABORATORY

QUARTERLY OCCURRENCE

ANALYSIS

DEEPER LEARNING THROUGH EVENT ANALYSIS

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INL/EXT-17-40995 - FY-17 1st 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 82 reportable events (13 from 1st quarter (Qtr) of fiscal year [FY]-2017 and 68 from the prior three reporting quarters), as well as 31 other issue reports (including events found to be not reportable and Significant Category A and B conditions) identified at INL during the past 12 months (seven from this quarter and 24 from the prior three quarters).

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

Highlights...

INL reported 13 events this quarter. The average number of events reported each quarter has decreased from 21.3 in FY-15 and 21 in FY-16 to 13 so far in FY-17. Historically, the annual holiday curtailment results in a decrease of event occurrence. Forty three percent of 1st Qtr FY-17 events were associated with equipment problems. The rate of higher significant events (those reported as Operational Emergencies, Recurring Issues, and/or Significance Categories 1 or 2) continues to trend downward. No higher significant category events were reported during 1st Qtr FY-17. Over the past 24 months, the average number of days between significant occurrences is trending in a positive direction and 199 days have passed since a higher significant event has occurred. This quarterly analysis reviews reportable and non-reportable events and provides a summary of Lessons Learned issued by INL.





1st QUARTER FY-17 INL OCCURRENCE RATE TREND SNAPSHOTS

From October 1, 2016, through December 31, 2016, INL reported 13 new events to the U.S. Department of Energy (DOE) in accordance with DOE Order 232.2, "Occurrence Reporting and Processing of Operations Information." 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 (P&T) (Group 8), Noncompliance Notifications (Group 9), and Management Concerns (Group 10).

In addition, INL reported seven events through Initial Notification Reports (INRs) and INL's local issues tracking software (LabWay) that did not meet Occurrence Reporting and Processing System (ORPS) reporting thresholds.

TREND SNAPSHOT

Occurrences by Facility: During the reporting quarter, the Advanced Test Reactor (ATR) reported 46% of the events that occurred. Eighty three percent of those were associated with performance degradations of Safety Class or Safety Significant Component. The majority of these events are discovered during reactor shutdown when the equipment is not required to be in service.





TREND SNAPSHOT

Occurrences by Reporting Criteria:

During the 1st Qtr FY-17, INL experienced the majority of events related to: Group 4, Facility Status (43%), Group 10, Management Concerns (22%), and Group 2, Personnel Safety and Health (21%).

Comparative analysis to the balance of the DOE Complex is shown in the chart above and is explained in each section of the report that follows. The balance of the DOE Complex reports the majority of events in Group 2 (31%), Group 10 (51%), and Group 4 (18%).

TREND SNAPSHOT

Lessons Learned: The use of INL's Lessons Learned program decreased slightly below the goal of 1750 views this reporting quarter to 1724. The decrease is attributed to mandatory curtailment during the holidays and is expected to rebound in 2nd Qtr FY-17.

The INL Lessons Learned Program is an integral part of the feedback and improvement process required by DOE. INL uses the OPEXShare platform (www.opexshare.doe.gov) to facilitate the sharing of information and operational experience. Those lessons that are generated by INL and that INL feels are most significant or novel are in turn shared across the complex through the DOE Headquarters Lessons Learned Program database. During 1st Qtr FY-17, INL shared seven such lessons through the OPEXShare platform. These lessons include:

- INL-2016-0049, Inadequate Lockout/Tagout Results in Hand Injury FINAL Lessons Learned
- INL-2016-0050, FCF Suited Entry Repair Area Personnel Contamination
- INL-2016-0051, Bomb Threat at the Engineer Research Office Building
- INL-2016-0045, Employee Inadvertently Directed to Cross Into a Contamination Area
- INL-2016-0021, Unanticipated Alpha Levels in Sample Bag
- INL-2016-0042, Power Discovered in Electrical Panel During Work Due to Inadequate Lockout/Tagout
- INL-2016-0022, 3.5 Minutes, Driving Safety at Idaho National Laboratory

Lessons Learned recognize mistakes observe what works document them share them 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 1st Qtr FY-17, INL used internally generated and/or shared lessons from other sites to improve operations and learn from other's events and/or mistakes. Seven such lessons were internally generated and entered into OPEXShare to be shared with all INL organizations. The seven lessons learned are summarized below:

Inadequate Lockout/Tagout Results in Hand Injury Lesson 2016-0049

This was a follow-up lessons learned on a hand injury that occurred in June 2016 when a mechanic who was performing preventive maintenance on an air handler at the Energy Innovation Laboratory on the INL Idaho Falls Campus received an injury to his right ring finger. The mechanic had isolated the fan electrically through a simple Lockout/Tagout (LO/TO) of the variable frequency drive (VFD) and observed the fan slow to a stop. After removing the belt guard, he reached back and placed his hand on the belt system to brace himself as he stood up. He did not notice that the fan had unexpectedly started to rotate. His hand was pulled between the belt and the pulley resulting in trauma to his right hand and a broken bone in the ring finger.

ISSUES

Investigation into this event identified the following issues contributed to it:

• Loss of situational awareness. The mechanic lost situational awareness and did not notice that the fan had started to move when he reached behind his back and



placed his hand on the fan belt. He did not expect the fan to move because he had locked out the electrical

source of energy for mechanical movement and confirmed the fan had stopped before he removed the guard. In addition, he had never experienced the fan movement during this maintenance activity in the past. He did not recognize the risk of potential fan movement from other sources. Blocking fans during maintenance is not a common practice due to the need to move the fan belts or pulleys during some maintenance activities.

- System interactions were not fully understood. The LO/TO isolated only the electrical energy for the return fan and did not address other potential energy sources for mechanical movement; in this case, from pressure differential from the supply fan. In a recreation of the system response during the event, the return fan consistently began movement approximately 2.5 minutes after the supply fan was returned to ready state.
- Information regarding the manner in which the task was performed previously was not documented, analyzed, or used to plan future tasks. Review of historical system data identified that both the supply and return fans were locked and tagged out throughout maintenance of both fans in previous maintenance activities. In this evolution, the mechanic removed the LO/TO from the supply fan prior to beginning work on the return fan.

What We Can Learn:

- Identify all the hazards of an activity and appropriately implement controls for those hazards.
- Understand your system interactions and incorporate that information into work planning.

Collect, analyze, and use information from previous tasks.

Fuel Conditioning Facility Suited Entry Repair Area (SERA) Personnel Contamination Lesson 2016-0050

Fuel Conditioning Facility (FCF) Operations personnel were working in an airborne radioactivity area (ARA)/high contamination area (HCA) wearing appropriate personal protective equipment (PPE). Personnel worked in the area for approximately 2.5 hours before exiting. Upon exiting, during a whole body frisk, it was discovered that one of the entrants had contamination on their modesty clothing below the knee. A Health Physics Technician (HPT) responded appropriately and cut the contaminated clothing away. No personnel contamination was found after decontamination was performed on the entrant.

During a fact-finding meeting, it is speculated that the worker possibly degraded the outer pair of PPE while kneeling and perspired enough to saturate the PPE allowing contamination to permeate through the PPE onto the workers modesty clothing. Personnel should ensure that secondary barriers (e.g., plastic, herculite) are used between pressure points (e.g., knees, shins, elbows) and contaminated surfaces to reduce the risk of contamination wicking through PPE.

Personnel do not perspire at the same rate and individuals should frequently selfevaluate while working in these conditions as wet or damp PPE and



modesty clothing allow contamination to wick through easily. If individuals suspect they have damaged their PPE or are beginning to sweat through their PPE, they should notify the HPT and their supervisor immediately and begin a controlled exit from the area to minimize the potential of a personnel contamination event.

What We Can Learn:

- Ensure that secondary barriers are used between pressure points and contaminated surfaces to reduce the risk of contamination wicking through PPE.
- If perspiration is compromising PPE, entrants should notify a HPT and their supervisor immediately.

- Frequent self-evaluation of working conditions are a good practice.
- Abrasive wear on PPE may also cause a wicking issue.
- Consider ergonomic conditions when working in close spaces to prevent cross contamination.

Bomb Threat at the Engineering Research Office Building

Lesson 2016-0051

On September 23, 2016, the INL Warning Communications Center received notification from a BEA employee that an individual made a bomb threat to the Engineering Research Office Building (EROB). After receiving the bomb threat, personnel in the affected and adjoining facilities were told to stay in their buildings as information indicated that the potential threat (bomb) was in the parking lot.



ISSUES

While response to the event was within current procedures, the following issues were identified as opportunities for improvement:

- Personnel had limited information on the event.
- Many learned of the threat via phone calls from people outside of their facility and through social media.
- The facility voice-paging system was difficult to hear and understand.
- Information shared over the voice-paging system was limited.
- Moving to a "911" service using INL acronyms and references may cause confusion.
- "Take Shelter" vs. "Lockdown" (DOE vs. Local Law Enforcement) terms were confusing to some.
- No consistent interpretation of the word "credible."

What We Can Learn:

- Site-wide notifications via intercoms, texting, e-mails, etc., needs to be improved as an alternate means of communicating information to employees during these types of events.
- Ensure the use of the voice-paging system includes training and that the system is tested for clarity and volume.
- Communicate the different terms that may be used by local officials having jurisdiction over some INL in-town facilities.
- Remind employees that addressing the threat is the priority over communication updates until the threat is neutralized.
- Train employees on what to expect for this type of event.

Employee Inadvertently Directed to Cross Into a Contamination Area Lesson 2016-0045

A subcontracted employee entered a posted contamination area (CA) while working on the reactor main floor of the Advanced Test Reactor (ATR). This employee was only authorized to work in a radiological buffer area (RBA) under continuous radiological escort, was not signed onto a radiological work permit (RWP), and did not have the appropriate radiological personnel protective equipment (PPE) for entry into a CA.

The event occurred when the subcontracted employee was directed to enter an elevated platform by an ATR manager. The manager did not recognize that the elevated platform was a CA and could not see the posting from his vantage

point. The manager shifted positions to speak to other personnel on the job and from his new position could see the platform was posted as a CA. Once it was recognized that the employee had entered the CA, the subcontract employee, area, and path of travel were promptly controlled and surveyed by Radiological Control Technicians. No



contamination was detected. All appropriate notifications where made.

ISSUES

The investigation identified the following issues:

- The radiological escort did not maintain full control of the untrained and unqualified subcontracted employee.
- The subcontracted employee was directed to perform work by someone who was not designated to provide such direction.
- A survey was not completed for removable contamination on the elevated platform prior to commencing work, as this area was not normally entered.

What We Can Learn:

- Informational signage, such as CA boundary signs, placed to delineate boundaries for elevated locations may not always be clearly visible from every location on the ground.
- Employees' assigned radiological escort duties for the purpose of escorting radiologically untrained/unqualified personnel must ensure that those personnel are under their full view and control at all times. The escort must be able to ensure that these visitors are not allowed into radiologically controlled areas without the proper PPE, control sets, and appropriate RWP. In addition, escorts must be constantly vigilant for situations where other people are trying to help, actually introduce hazards to contractor personnel by encouraging or allowing work in an area where they are not authorized.
- Only designated personnel are allowed to direct subcontract workers. In this case, a manager directed the subcontracted employee to enter a CA in order to place a piece of equipment. The manager was not in a position to see the CA sign hanging from a safety chain at the top of the access ladder. The subcontracted employee noticed the CA sign, but assumed it was okay to proceed because the manager directed him to place the equipment on the elevated platform.
- Radiological surveys must be completed in overhead areas. At ATR, all elevated surfaces in a RBA, not just overhead areas, must be considered potentially contaminated or may contain elevated radiation levels that require a current Radiological Controls survey and Radiological Controls permission before access is allowed.
- Individuals working in radiologically controlled areas must be keenly aware of signage, such as CA boundary signs, placed to delineate boundaries. This signage may not always be clearly visible from all vantage points or access ways. It is the responsibility of radiological workers to ensure they understand where the existing

boundaries are located and to also know if the areas are to be entered. All radiological entry requirements need to be met prior to entry being made. Radiological escorts are required to be trained and qualified radiological workers and must ensure that untrained escorted personnel under their charge do not enter controlled areas where additional radiological training is required.

Unanticipated Alpha Levels in Sample Bag Lesson 2016-0021

A researcher in an INL lab was coating Low Enriched Uranium (LEU) graphite blocks with epoxy. As a personal best practice, the lab space coordinator informed the Radiological Control Operations Department that two freshly coated blocks would be left out overnight. A radiological control technician (RCT) surveyed two clear plastic bags located on the lab's benchtop



that had earlier contained the graphite blocks. A survey of the internals of the bags indicated alpha levels higher than anticipated.

To rule out natural occurrences of heightened alpha readings, the RCT completed several reevaluations. Upon confirmation of the elevated alpha levels inside the plastic bags, the RCT surveyed the surrounding areas in the lab, the equipment used to epoxy the LEU blocks, and the waste generated from processing (e.g., gloves, wipes), but found no contamination. The researcher who performed the epoxy coating was also surveyed and found to have no contamination on his clothing or belongings.

During the ensuing fact-finding, several issues were identified:

- The work control process was not followed. The
 researcher began work without a principal researcher
 briefing or work release as no principal researcher had
 been formally identified. The lab manager approved
 work under a general work control document; however,
 the work was outside the scope of the approved
 document. The department manager was not aware of
 the work being performed by his personnel.
- The second overarching issue involves consistent work practices and communication between organizations. In the past, a conscientious Radiological Engineer had usually performed a hazard control evaluation, even

though it was not required. In this case, the researcher assumed the graphite blocks had been surveyed and declared clean and that the lab space coordinator/radiological source custodian assumed the material had been subject to a hazard control evaluation. In fact, neither the survey on the internal contents nor the hazard control evaluation had been completed.

What We Can Learn:

- Communication and common understanding are proven hazard mitigation tools.
- Positions, procedures, and processes exist for a reason. Adherence to proven methods tend to yield the best results.
- Line managers need to ensure that new employees understand the work control process.
- Hazardous work must be fully understood by all parties and be addressed by active work control documents.
- Inconsistently applied practices lead to dangerous assumptions. Safety gaps arise where knowledge and communication gaps exist.
- Markings must include enough information to prevent assumptions.

Power Discovered in Electrical Panel during Work Due to Inadequate Lockout/Tagout

Lesson 2016-0042

Electrical power was found within a breaker panel during an electrical outage at ATR. After the zero energy checks were



performed, power was discovered by an electrician using a proximity tester prior to removing a panel cover. The panel had been missed and was not included on the LO/TO record sheet; however, it was part of the work

scope listed in the work order being executed. After discovering power, all work was stopped and appropriate personnel were notified.

At the time of this discovery, no invasive work had been conducted on the energized panel. Work on other electrical panels in the same building that were part of the LO/TO had already commenced and a few breakers had already been removed. These breakers, along with the panel covers, were reinstalled and all work associated with the outage was suspended. No employees were injured or exposed to live electrical components during this event.

The best practice of using a proximity tester after zero energy checks and prior to performing work helped identify the hazard and prevent exposure and potential injury.

ISSUES

- Five individuals failed to notice that the panel was part of the work scope resulting in an inadequate LO/TO.
- A high amount of trust was put in the knowledge of the Job Supervisor (JS) during the preparation of the LO/TO.
- Walk-downs were not conducted by the employee responsible for the preparation of the LO/TO and by the employee responsible for the final review. The only walkdowns that were successfully conducted were done by the JS and the System Engineer (SE).
- Not all applicable documents were adequately reviewed during the preparation of the LO/TO. The applicable work order for this event listed the panel in the scope of work, but was missed by all individuals who helped prepare the LO/TO. Also, the JS and SE did not have the work order in hand to review during their walk-down of the work area. Further, the work order was not consistently used while preparing the LO/TO.
- Drawings were the primary source of information used in preparing the LO/TO.

What We Can Learn:

- The LO/TO preparer is expected to use all available documentation and resources to help identify isolation points for LO/TOs. When reviewing documentation to determine the adequacy of a LO/TO, it is expected that all documents that are required to be reviewed are indeed reviewed.
- Using all available resources is expected during the preparation of LO/TOs. This includes knowledgeable employees such as the JS and their previous electrical experience. However, information given by knowledgeable employees needs to be confirmed and verified using other documented sources.
- Drawings and information for facilities needs to be checked and verified for accurate and up-to-date information prior to conducting work. Also, access to old drawings or drawings that have sensitive information can be hard to access at times. Ensuring all available drawings are used is essential to identifying all potential hazardous points.

3.5 Minutes, Driving Safety at Idaho National Laboratory

Lesson 2016-0022

INL produced a driver safety video to heighten awareness of driver safety and to build on INL's strong safety culture. The video shows actual footage of a few close calls that INL professional bus drivers witness almost daily as they drive employees between their pickup locations and the desert Site. In some cases, defensive actions of the professional drivers averted a tragedy on the highway.



The video was distributed to all members of INL management to hold safety meetings with their staff to share the video and hold discussions to encourage drivers to take their time, use caution for the safety of themselves and other motorists, and to motivate those who have the option to ride INL buses to take advantage of the service provided.





This lesson was also shared with the OPEXShare community. Feedback from OPEXShare was very positive and included comments such as:

"Wow! One of the best driver safety reminders I've seen in a long time."

"The video is worth the viewing. Plenty of narrow misses and my hat's off to the bus drivers who expertly handled avoiding a collision. It's worth putting things into perspective when risking exceeding the speed limit or traveling conditions. Is it worth your life, your fellow employee's life to save a few minutes? Who needs that kind of stress on the road?"

"It helps put it into perspective of how little you really gain versus how much risk you are taking and subjecting others to. Well done! Thanks for sharing this!"

"Excellent, well thought out and meaningful video. Thank you for giving me the opportunity to share with my co-workers at Hanford."

1st QUARTER FY-17 IDENTIFICATION OF RECURRING EVENTS



A review of recent operational performance data did not identify any events that would be noted as "recurring;" however, an analysis of the available data did identify a potential adverse trend that warrants further analysis. This information was shared with INL mission centers in the quarterly INL Integrated Operations Performance Analysis Committee (IOPAC) meeting. This potential adverse trend is as follows:

 Events involving subcontractors have been trending upwards over the last four quarters and—more importantly—over the last two years. In FY-14, there were only two events involving subcontract workers. This increased to seven in FY-15 and 14 in FY-16. This fiscal year, five of the 13 reportable events have involved subcontractors. This is due in part to more subcontract work being performed.

Additional patterns were noted but determined to not be of significance. These patterns are discussed below. Of the 82 events reported in the last four quarters:

- Facility status events account for 39% of all events. The majority were identified at ATR during reactor shutdown when system testing is performed. This is not unexpected.
- Safety and Health Related events (22 total) accounted for 27% of events. Eighteen of these were related to work involving hazardous energy.
- Events caused by human performance errors are increasing. Over the past four quarters, 46% of the events occurring at INL were the result of human performance errors. This rate has fluctuated each quarter from 57% in the second quarter of FY-16 to 43% this quarter.

1st QUARTER FY-17 ANALYSIS OF PERFORMANCE COMPARED TO OTHER DOE COMPLEXES





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 higher significant events including Significance Category (Sig Cat) OE, 1, 2, and R occurring at INL. INL's performance metrics are as follows:

Green: Less than 10% of the events reported at INL are OE, Sig Cat 1, 2, or R; **Yellow**: Greater than 10% and less than 20% of the events reported at INL are OE, Sig Cat 1, 2, or R; and **Red**: Greater than 20% of the events reported at INL are OE, Sig Cat 1, 2, or R. Control Limits for Sig Cat OE, 1, 2, and R events were set at +10% of the 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 chart to the left, INL is experiencing a downward trend in the number of higher significant events occurring at the INL over a four-year period. So far this fiscal year, INL has not reported any high significant events.

During FY-14, INL reported a greater percentage of higher significant events as compared to other DOE facilities (see chart to the left). However, this rate has steadily decreased and INL continues to meet its goal of less than 10% of events reported as highly significant. So far in FY-17, no reportable events at INL were of higher significance.

Additionally, 64% of events reported at INL during FY-17 are Significance Category 3. This is above the complex baseline average of 43%. And 36% were Significance Category 4 (slightly lower than the complex baseline 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.

1st QUARTER FY-17 GROUP 1 – OPERATIONAL EMERGENCIES

There were no operational emergencies reported during the 1st Qtr FY-17. The last operational emergency at INL 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-17, two Operational Emergencies were reported throughout the DOE Complex, equating to approximately 1% of the total events reported.

1st QUARTER FY-17 GROUP 2 – PERSONNEL SAFETY AND HEALTH

TREND SNAPSHOT

Personnel Safety and Health Events: During 1st Qtr FY-17, there were two reportable events related to personnel safety and health (e.g., occupational injuries, occupational exposures, fires, explosions, or hazardous energy). One additional non-reportable event was communicated via an Initial Notification Report (INR) related to criteria in this reporting group. The rate of occurrence of reportable personnel safety and health events continues to trend updwards over the last two years.



Although INL has recently seen an increase in injuries, few of these injuries have been reportable. The number of events reported under Group 2 criteria has decreased since last quarter (eight events reported last quarter compared to three this quarter).

When compared to the balance of the DOE Complex, the rate of occurrence of Group 2 events at INL was lower than that reported elsewhere in the complex during 1st Qtr FY-17. INL

reported 21% of events in this reporting group, while the balance of the complex reported 31%.



The reportable and non-reportable events occurring during 1st Qtr FY-17 are summarized below:

Electrical Cabinet was not Posted or Barricaded

NE-ID--BEA-CFA-2016-0005 (Significance Category 3) After performing work in a substation walk-in electrical cabinet, subcontractors failed to either replace the personnel door to prevent others from entering unintentionally, or to post and barricade the area alerting others to the potential hazardous electrical energy.

The walk-in cabinet is located inside the Naval Reactor Facility (NRF) substation on the INL site. The subcontractors were performing work inside the cabinet in support of an INL project. The door to the cabinet opens at a 90 degree angle and was difficult to work around. To mitigate this problem, the subcontract workers asked the INL lineman if they could remove the door to gain better access to the cabinet. The lineman agreed and the door was removed. Two days later, an NRF safety and health representative requested a barricade be positioned and the area posted when the door was removed. These barriers were established as requested. The following day, while performing cleanup in the area, one of the workers moved the barricade to the inside of the door. He inadvertently forgot to return the barricade to the outside of the doorway when the subcontractors completed work that day.



NRF personnel discovered the open cabinet during a walkthrough of the facility the following morning. NRF personnel notified INL Power Management who took action to barricade the area with Danger tape.

What We Can Learn:

The decision to remove the door constituted a change in the work direction; however, the hazard mitigation for this change was not adequately evaluated, understood, or briefed. When changes to work scope occur, employees must take the time to evaluate the change so that work can be performed safely and that personnel understand their new responsibilities.

Electrical Energy Discovered on Legacy Circuit

NE-ID--BEA-MFC-2016-0014 (Significance Category 3) After installation and release of a LO/TO, a subcontractor, using a proximity tester, discovered an energized 120 volt (V) legacy circuit. The subcontractor was performing a safe to work check prior to beginning work remodeling the H-hall restroom in building MFC-752 when the energized circuit was found.

Electrical configuration management and a workability walkdown had not identified this legacy circuit as separate to those circuits already isolated via the LO/TO. The zero energy check performed prior to work did not measure any energy due to the design of this legacy circuit (Edison).

Initial investigation into this event found that electrical drawings showing the circuit had not been reviewed prior to LO/TO planning because personnel made incorrect assumptions that accurate drawings would not be available and that any available drawings would not be helpful.

What We Can Learn:

Use all available information during the planning phases of hazardous work activities. MFC procedures require a documented roundtable review of all electrical drawings during the planning stage of the LO/TO. The original drawings from 1962 clearly show the existence of the Edison circuits. Had personnel performed work in accordance with procedures and management expectations, this event could likely have been avoided.

Other Non-Reportable Events CO 2016-3334

A BEA employee fell while walking across the EROB (IF-654) parking lot, thereby injuring his knee. Co-workers assisted him in getting to his feet, but he then fell a second time. The co-workers called for an Idaho Falls ambulance to respond and the employee was transported to Eastern Idaho Regional Medical Center.

What We Can Learn:

Approximately 7" of snow had fallen throughout the day making it difficult to see the icy conditions of the parking lot under the snow. Extra care should be taken during inclement weather to ensure you maintain good situational awareness of your surroundings and of the environment. In addition, this area has experienced a higher number of significant snowfall this winter making it difficult for personnel to keep up with snow removal activities.

ANALYSIS FOR RECURRING EVENTS:

Personnel Safety and Health occurrences have been one of INL's most frequently reported event type and have accounted for 21 reportable and eight non-reportable events in the past 12 months. During this quarter, both reportable events were related to the unexpected discovery of an uncontrolled hazardous energy source. An adverse trend related to less-than-adequate implementation of conduct of operations, which manifested in LO/TO issues was identified last quarter. This data will be monitored to see if performance improves as corrective actions are implemented.

Also, in the past 12 months, two reportable events were the result of slips, trips, and falls. A review of these injuries found no commonalities that would warrant identification as a recurring problem.

Finally, analysis of the eight non-reportable events that occurred in the past year found no recurring themes or a problem of a similar nature.

TREND SNAPSHOT

Nuclear Safety Basis Events: There was one nuclear safety basis event reported during 1st Qtr FY-17. The rate of occurrence of nuclear safety basis events continues to tend downward over the past two years. During the past 12 months, four events have been reported under this criteria; two were identifed at ATR and two at MFC. **An analysis of the events did not reveal any commonalities would indicate a recurring trend or recurring events.**

When compared to the balance of the DOE Complex, INL continues to report a lower percentage of events under the Group 3, Nuclear Safety Basis, criteria than the rest of the complex. In FY-16, 6% of INL's events and 9% of the balance of the DOE Complex events were reported under Nuclear Safety Basis criteria.



The number of INL events reported under these criteria continues to trend downward over the last two years.



Failure to Follow Experiment Safety Analysis Radiation Control Monitoring Commitments at the Advanced Test Reactor

NE-ID--BEA-ATR-2016-0040 (Significance Category 3) In mid-December, the ATR Shift Supervisor was notified by the Radiation Control foreman that the tritium monitoring requirements documented as Experiment Safety Analysis (ESA) commitments in the Tritium Materials Irradiation Separate Effects Test (TMIST)-3 ESA had not been followed routinely since installation of the TMIST-3 experiment in ATR operating Cycle 160A. The ESA commitment requires that personnel entering the Outer Shim Control Cylinder (OSCC) drive corridor or the Nozzle Trench must have continuous tritium monitoring if TMIST-3 gas flow is maintained during outage periods. The requirements of the ESA are contained in ATR Operating and Maintenance Manual (OMM)-7.1.13.1.4.1 (General Exclusion Area Entry) procedure. TMIST gas flow had been maintained during the duration of the ATR reactor outage, but routine radiation and tritium monitoring of the gas lines did not indicate any elevated tritium levels. An actual unsafe condition did not exist.

As a result of the discovery, work in the affected areas was halted. The Radiation Control foreman initiated a revision to the Radiation Work Permit (RWP) adding the requirement for tritium monitoring for work in the affected areas.

Other Non-Reportable Events

There were no additional non-reportable events related to nuclear safety basis problems documented in LabWay during 1st Qtr FY-17.

ANALYSIS FOR RECURRING EVENTS:

Analysis of the four events reported under the nuclear safety basis criteria over the past year revealed no commonalities or

recurring themes. The four events consisted of a violation of a TSR administrative control, a missed TSR surveillance, a positive unreviewed safety question resulting from inadequate assumptions in an engineering calculation and analysis report, and the violation of a credited hazard control that occurred this quarter.

1st QUARTER FY-17 GROUP 4 – FACILITY STATUS EVENTS

TREND SNAPSHOT

Facility Status Events: Facility status events account for 39% of the events reported this fiscal quarter. The number of events reported under this criteria decreased from last quarter from 13 to 6. The rate of occurrence of facility status events is trending slightly downward over the past two years. Five of the six events this quarter occurred at ATR and one occurred at MFC. All of the ATR events were related to performance degradation of Safety Class (SC) or Safety Significant (SS) Structure System or Component (SSC). Thirty-two events have been reported at INL under the Group 4 reporting criteria over the past 12 months; 28 of these occurred at ATR.

The percentage of occurrence of Group 4, Facility Status, events at INL is higher than that of the balance of the DOE Complex (43% at INL versus 18% throughout the complex). Sixty-nine percent of the Group 4 events in the past 12 months have been reported as performance degradation of an SC SSC when it was not required to be in service, all of which occurred at ATR.





The 13 events reported under the Group 4 – Facility Status criteria during the 4th Qtr FY-16, are summarized below.

Advanced Test Reactor Confinement Breach

NE-ID--BEA-ATR-2016-0035 (Significance Category 3) An ATR Shift Supervisor received a report of a break in a drain line that drains the Reactor Control Room (RCR) break room sink to the sewer system. The drain line runs from the RCR break room inside the confinement area through a wall into the ATR canal area, and then outside the confinement area. The break is located in the ATR canal area, just outside the confinement area. The break in the pipe could constitute a confinement breach.

The pipe on the confinement side has a loop seal (P-trap) and a vacuum breaker which should maintain confinement integrity. It is unlikely that a breach exists; however, the break creates a configuration that is not tested by the confinement surveillance (e.g., building leak rate test).

An investigation found that the construction subcontractors who installed the drain line failed to realize they had not glued one of the pipe joints. Both the subcontractor and an INL Quality Assurance representative verified the work had been completed prior to it being turned over to ATR Operations, but failed to catch the unglued joint.



This unglued joint was almost hidden from view behind the unistrut leg.

What We Can Learn:

A visual inspection or hands-on check of the joints would have identified the problem. Because of the location of the joint, it was difficult to visually inspect the joint. However, this does not alleviate the responsibility to ensure work has been completed properly.

Failure of Advanced Test Reactor Canal Level Alarm

NE-ID--BEA-ATR-2016-0036 (Significance Category 3) The ATR South Safety Rod stuck following a manual reactor SCRAM. At the time of the discovery, ATR was concluding operating Cycle 160A-1 and was performing a planned shutdown to enter a scheduled maintenance outage. Operators performed appropriate immediate actions for response to a stuck Safety Rod, ensured the reactor was safely shut down, and completed the facility shutdown procedure.

The ATR has six Safety Rods. Five of these six rods were required to be OPERABLE for the 160A-1 operating cycle to safely shut down the reactor; one of the five is assumed in the safety analysis to fail upon a SCRAM. Five Safety Rods inserted as expected.

Loss of Advanced Test Reactor Canal Level Alarm

NE-ID--BEA-ATR-2016-0039 (Significance Category 3) The ATR control room experienced a loss of all alarm indication due to the securing of computers in the Reactor Data Acquisition System (RDAS) room for performance of Detailed Operating Procedure (DOP)-1.8.7 (670-E-1871 RDAS Room Power Trip Panel System Operability Test). The ability to monitor the ATR storage canal level alarm was lost. The ATR Control Room Supervisor (CRS) declared the canal level alarm inoperable and entered Technical Safety Requirements (TSR)-186, Limiting Conditions for Operation (LCO)-3.5.6, Condition A. The System Operational (SO) testing procedure was halted and the annunciator system was recovered to normal. Immediate actions for LCO-3.5.6 were completed and the LCO was exited at 1449. No cask-handling activities were in progress at the time and a low level did not exist in the canal during the event.

Advanced Test Reactor Door 51 Confinement Seal Air Supply Failure

NE-ID--BEA-ATR-2016-0041 (Significance Category 4) The ATR Shift Supervisor was notified that the air supply to door D-51, the bulkhead door between the ATR reactor main floor and the storage canal area, had failed. D-51 and its associated inflatable seal provides a boundary for the ATR confinement area. The door was being closed and operators were routing air to the seal at the time of the failure.

Work to inflate the door seal was stopped and it was placed in a safe condition. The ATR was in a scheduled shutdown at the time of the failure and the confinement was not required to be operable.

Advanced Test Reactor Instrument Uninterruptible Power Supply Battery Inoperable

NE-ID--BEA-ATR-2017-0001 (Significance Category 4) An ATR Shift Supervisor was notified by electricians that the specific gravity for the E-59 battery bank (Instrument Uninterruptible Power Supply [UPS] battery bank) was found to be low out of specification. Electricians were performing weekly battery surveillance in accordance with Detailed Operating Procedure 2.8.18 to satisfy Technical Safety Requirement (TSR)-186 Safety Requirement 4.4.2.2 at the time of discovery.

The E-59 battery bank is required to be operable per TSR-186 Limiting Condition for Operations (LCO) 3.4.2 when it is supplying loads required to be operable. However, at the time of discovery, these loads were supplied via the Utility UPS, while the Instrument UPS was not required to be operable.

Oven Fire Results in Building Evacuation

NE-ID--BEA-ATR-2016-0013 (Significance Category 3) Materials and Fuel Complex (MFC) cafeteria personnel were preparing food when they discovered a small fire in one of their ovens. Cafeteria staff used a Class-K fire extinguisher to extinguish the fire. An employee in the cafeteria pulled the manual fire alarm and the tenants of building MFC-752 were evacuated. The INL Fire Department (FD) responded. The flame was extinguished before the FD arrived. The FD inspected the equipment to ensure the fire was fully extinguished.

Other Non-Reportable Events

There were four additional non-reportable events related to facility status problems reported during 1st Qtr FY-17. They are as follows:

CO 2016-2750

In October, the Fuel Manufacturing Facility (FMF) was in normal operations of the Sodium Separation System (SSS). During operations, a high average temperature condenser alarm actuated and the engineer was notified. After inspection of the SSS, it was discovered a flexible hose had become disconnected from the blower to the condenser. Due to the SSS being a sealed system and separate from the glovebox containment, no contamination was released.

Upon reconnecting the hose, a puff of what appeared to be smoke exited the exhaust port. Shortly thereafter, a high-high temperature alarm sounded causing the operator to press the emergency stop button and pull the manual fire alarm to evacuate FMF as a precaution.

The INL fire department responded and reported no indication of a fire.

SMC-CO 2016-0283

Management at the Specific Manufacturing Capabilities (SMC) facility determined that an overhead crane in Test Area North (TAN) building 629 had been operated during the three previous work days without a current monthly inspection tag. A recently qualified SMC employee performed the required daily pre-use inspection on the overhead crane and discovered that the monthly inspection tag had expired. The employee reported the condition to his supervisor and management. The crane was not used. Further investigation found that the October monthly inspection had not been performed because the crane was out-of-service pending repair. On Monday, October 31, 2016, SMC Maintenance personnel completed the repair and Operations removed the out-of-service tag. The investigation further found that Operations had used the crane the following Thursday (11-03-16), Monday (11-7-16), and Tuesday (11-8-16), but the expired monthly inspection was not discovered on any of those days.

There were no issues with the functionality of the crane when it was used following repair. The DOE Hoisting and Rigging Manual, which refers to ASME B30.2-2011, requires a monthly inspection for normal service use. Additionally, crane pre-use inspections require determination that all preventive maintenance and inspections are current.

What We Can Learn:

Attention to detail is paramount to ensuring safe operations of plant equipment. Sometimes we become complacent when working with a familiar piece of equipment each day and we may overlook the checks and balances we've put in place to ensure the equipment will function as designed.

CO 2016-3091

A subcontracted employee positioned a crane in the vicinity of a nuclear facility in order to perform roof repairs on an adjacent non-nuclear facility. After positioning the crane, the subcontractor began to perform pre-operational checks, including extending the crane arm. Shortly thereafter, the FCF Shift Supervisor noted that the crane had been positioned next to the nuclear facility and asked the workers to take a timeout while information regarding their scope of work was reviewed.

It was determined at this time that an Unreviewed Safety Question (USQ) evaluation had not yet been approved to allow the work to proceed. Approximately an hour later, the USQ evaluation was completed and authorization paperwork was approved. The job was then allowed to resume.

What We Can Learn:

There were miscommunications and knowledge gaps regarding the USQ requirements. Facility personnel must make sure subcontractors fully understand when they are authorized to begin work and when they need to pause.

CO 2016-3195

The 786-M-1 diesel generator was found to be displaying several out-of-specification indications, some of which were

determined to be erroneous. Initial indications lean toward a failure in the control system for the generator. The 786-M-1 diesel generator and associate #3 deepwell were not operable at the time of discovery.

ANALYSIS FOR RECURRING EVENTS:

A review of the 32 Facility Status occurrences that were reported in the last 12 months was performed. Three events were related to diesel generators at ATR and five events related to ATR confinement doors. There were no similarities noted in these events that would indicate they are recurring.

Twenty eight of the events in the past 12 months were the result of degradation of a safety class or safety significant component; 22 of these occurred when the component was not required to be operable. All of them were discovered at ATR, primarily during preparation for reactor restart.

1st QUARTER FY-17 GROUP 5 – ENVIRONMENTAL EVENTS

TREND SNAPSHOT

Environmental Events: There were no environmental releases reported under the Group 5 reporting critieria during 1st Qtr FY-17. The rate occurrence of environmental events over the past two years is trending downward.

When compared to the balance of the DOE Complex, the percentage of occurrence of Group 5, Environmental Events, reported at INL is lower (0% compared to 3% during FY-17).





Other Non-Reportable Events

There was one non-reportable event related to an environmental problem or condition during 1st Qtr FY-17. That event is as follows:

CO 2016-3032

In November 2016, the Facilities and Site Services (F&SS) INL Research Center (IRC) complex manager was notified of a potential National Emission Standard for Hazardous Air Pollutants (NESHAP) violation. It was noted that the potential existed for IRC to exceed the 0.1 milli-rem per year (MREM/year) threshold. Exceeding the threshold would require approval from the Environmental Protection Agency (EPA).

The 40 Code of Federal Regulations (CFR) 61, Subpart H dose limit to the public is 10 MREM/year. Based on conservative estimates, this limit (e.g., 10 MREM/year for calendar year 2016) was not exceeded.

BEA personnel were calculating releases based on process information (e.g., heating rad material greater than 100 degrees Centigrade). When heating greater than 100 degrees Centigrade, absent more detailed information, conservative calculations assume 100% volatilization of radioactive material. The material in question is solid and was not 100% volatilized. A fact-finding exercise was held and additional information gathered. Actions are taking place to ensure future release estimates take this new information learned from this event into consideration.

ANALYSIS FOR RECURRING EVENTS:

Two events have been reported under the Group 5 reporting criteria during the past 12 months. Both were related to diesel fuel oil spills, occurred at ATR, and were reported in 2nd Qtr FY-16. There were no commonalities in the spills that would warrant them being reported as recurring. The only other environmental event in the past twelve months was the non-reportable event that occurred this quarter.

1st QUARTER FY-17 GROUP 6 – CONTAMINATION/RADIATION CONTROL EVENTS

TREND SNAPSHOT

Contamination/Radiation Events: There was one reportable event related to contamination/radiation control reported in 1st Qtr FY-17. The rate of these types of events is trending slightly updards over the past two years. There was also one non-reportable event reported this quarter.

One event reported at INL during 1st Qtr FY-17 was reported under Group 6, Contamination/Radiation, criteria. The balance of the complex reported a less percentage of events under this reporting criteria than INL events related to contamination and/or radiation control are some of the least reported event types at INL. These have only accounted for four events in the last 12 months.





Discovery of Legacy Contaminated Bricks

NE-ID--BEA-SMC-2016-0004 (Significance Category 4) A recently hired employee at the SMC facility discovered four taped and bagged lead bricks in a newly assigned locker in the TAN-679 women's locker room. Two of the bricks had information indicating that they may have been contaminated. The employee reported the discovery to SMC radiological controls technicians (RCT), who subsequently found that three of the four bricks showed beta-gamma contamination on a direct frisk through the bag and tape. No contamination was found on the outside of the bag. The locker had been empty for some years and SMC personnel had no records showing to whom it was previously assigned.

The origin of the bricks is unknown; labels on two of them indicated that they may have originally come from Test Area North Operations (TANO, a nearby facility at INL) in 1999. The other two bricks had no information other than a marking with a date earlier in the 1990s. The highest level of contamination that was detected on the direct frisk was greater than 10 times the threshold value in 10 CFR 835, Appendix D.

What We Can Learn:

The employee who found the contaminated bricks responded correctly and promptly reported the situation to radiological control personnel. When confronted with a similar situation, one should always engage personnel who are trained and qualified to assess the situation.

Other Non-Reportable Events

One reportable event related to radiological concerns was reported under Group 10, Management Concerns. The event can be reviewed later in this report. There was one additional non-reportable event related to radiation/contamination reported during 1st Qtr FY-17.

CO-2016-2459

MFC Radiological Controls Management was notified by the INL Internal Dosimetry Technical Lead that extremity dose results were higher than expected for two individuals working in the manipulator repair glovebox in the FCF. The FCF Nuclear Facility Manager (NFM) was notified of this condition. Work was restricted in the glovebox at FCF until a post-job evaluation could be completed.

The NFM conducted a post-job to determine the cause of this condition to be that personnel were not using an approved method to estimate exposure. The method they were using was inconsistent and inaccurate and resulted in low dose estimates.

What We Can Learn:

It is important to ensure personnel use approved processes to do their job.

ANALYSIS FOR RECURRING EVENTS:

There have been four reportable and eight non-reportable events under the Radiation/Contamination reporting criteria the past 12 months. A review of these events identified no commonalities, no adverse trends, and no recurring problems.

1st QUARTER FY-17 GROUP 7 – NUCLEAR EXPLOSIVE SAFETY EVENTS

There were no events related to Nuclear Explosive Safety during 1st Qtr FY-17. BEA has never reported an event under this reporting criteria since taking over the contract for the Laboratory in 2005. There have also been no events reported under the Group 7, Nuclear Explosive Safety Events, criteria within the balance of the DOE Complex during FY-17.

1st QUARTER FY-17 GROUP 8 – PACKAGING AND TRANSPORTATION EVENTS

TREND SNAPSHOT

Packaging and Transportation Events: There were no reportable Packaging and Transportation (P&T) events reported during 1st Qtr FY-17. The rate of occurrence of P&T issues is trending downward over the last 12 months. There were also no additional non-reportable events during 1st Qtr FY-17.

INL rarely reports events under Group 8, Packaging and Transportation, criteria. When compared to the balance of the DOE Complex this quarter, INL is reporting a fewer percentage of events in this reporting group.





Other Non-Reportable Events

There were no additional non-reportable events related to packaging and transportation activities reported during 1st Qtr FY-17.

ANALYSIS FOR RECURRING EVENTS:

INL has reported one event under this reporting criteria in the last 12 months. 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. This quarter, INL did not receive any noncompliance notifications. The two-year trend data for these types of events shows an increasing trend due to the event reported last quarter.

Five percent of the events occurring during FY-17 throughout the balance of the DOE Complex were reported under the Group 9 criteria.





Other Non-Reportable Events

There were no additional non-reportable events related to noncompliance notifications reported during 1st Qtr FY-17.

ANALYSIS FOR RECURRING EVENTS:

INL has reported one event in this reporting criteria during the last 12 months. 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 under reporting criteria for a management concern or issue during 1st Qtr FY-17. The rate of occurrence of reportable management concerns continues to trend upwards over the past two years. During the past 12 months, INL has reported 16 events under Group 10 management concerns.

Both INL and the balance of the DOE Complex has reported 22% of all events from FY-17 under Group 10, Management Concern, criteria.





The three events reported during 1st Qtr FY-17 are summarized below:

Tape Measurer Contacts Electrical Twist-Lock Outlet

NE-ID--BEA-AL-2016-0001 (Significance Category 3) The Analytical Laboratory (AL) NFM was notified that an electrical subcontractor in the MFC AL had been measuring along a wall preparation for cutting and attaching a length of conduit. As the subcontractor was retracting the metal measuring tape, the tape buckled and collapsed. As it collapsed, it twisted and fell into the space between a 20



amp, 3 phase, NEMA L18-20 twist lock electrical plug and the receptacle in which it was plugged. The subcontractor observed an arc and heard a noise indicating an

electrical short. The measuring tape was burned and showed signs of the metal being removed; however, the circuit breaker did not trip. The worker did not receive a shock and no one was injured.

What We Can Learn:

We should continually think outside the box. Workers in this event could have used a different tool to take measurements behind pieces of equipment. Tools such as a laser measuring device or cloth tape



measures would have been a better fit in this application.

Equipment Removed from Complex without Required Radiological Survey

NE-ID--BEA-CFA-2016-0006 (Significance Category 4) In November 2016, Big Shop Mechanics responded to a service request to repair a parking brake on a straddle carrier located inside the Idaho Nuclear Technology Engineering Center (INTEC). This piece of equipment had been placed outof-service (OOS) in 2010. Personnel had begun repairs in May 2016. At the end of November 2016, mechanics returned to repair the brake. Upon arrival, the mechanics noticed a radiological sign painted on the unit. The equipment was posted with a "Fixed Contamination, Contact Radiological Control" for hazard information (or see current survey map). Mechanics were told by INTEC representatives that the unit had indeed been surveyed and was ready to work. No review of the work document was performed at this time.

Mechanics proceeded to remove the brake components to be cleaned in the shop located at Central Facilities Area (CFA). The mechanics left the INTEC facility without Rad Con performing a release survey of the part in accordance with DOE Order 458.1.

Upon completion of parts cleaning, it was determined that the part needed to be repaired by a private service contractor in Idaho Falls, Idaho. Upon delivery to the private service contractor, it was recognized that the component had not been "Free Released" to leave INTEC. Notification was made to the State of Idaho Department of Environmental Quality (DEQ), that although contamination was not suspected, the appropriate surveys had not been completed.

The DEQ, with support from BEA's Radiological Controls, surveyed the component at the private service contractor's location; no contamination was found on the component or within the contractor's facility. Upon return to the site, Flour's Rad Con technicians also surveyed the component and performed a "Free Release" of the component at INTEC. On 12/01/2016, the component was returned to the private service contractor for repair.

What We Can Learn:

Do not make assumptions that something has been done, instead verify a critical task has been completed by reviewing the paperwork before proceeding.

Issues Identified During Cask Lifting Operations at the Remote Handled Low Level Waste Facility

NE-ID--BEA-CFA-2016-0007 (Significance Category 4) A subcontractor crane operator, while working at the site of the Remote Handled Low Level Waste (RHLLW) Facility, experienced adhesion (ice build-up) during the removal of a pre-cast concrete vault barrel section from the base section.

The Operator applied additional force to free the frozen sections. When the load broke free, it caused the upper portion of the vault barrel section to move rapidly upward and oscillate, thereby dynamically loading the crane and the rigging. Inspection of the rigging found that one of the three threaded inserts (e.g., anchor) that attached the load to the rigging was slightly bent and spalling of the concrete around the anchor point had occurred.

What We Can Learn:

Hazards often change during work execution. If you notice the hazard has changed, stop and re-assess the situation to ensure you continue to perform work safely.

Other Non-Reportable Events

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

ANALYSIS FOR RECURRING EVENTS:

During the past 12 months, there have been 16 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. The nine events reported as not meeting ORPS reporting thresholds were:

- 1. Batteries Dropped During UPS Maintenance.
- 2. Package Containing Unexpected Items Delivered to EROB.
- 3. Fire Alarm Monitoring Capability Interruption.
- 4. Worker Drops Rope and Enters RBA without Radiological Controls Support.
- 5. Electrical Fire in a Moveable Server Cabinet.
- 6. Radiological Contamination Area Boundary Compromised at the Advanced Test Reactor.
- 7. Identification of Adverse Trend in Lockout/Tagout Events at the Idaho National Laboratory.
- 8. Equipment Removed From Complex without Required Radiological Surveys.
- 9. Issues Identified During Cask Lifting Operations at the Remote Handled Low Level Waste Facility.

Three events that were reported as near misses during the past 12 months include:

- 1. Broken Power Cable During Vacuum Excavation at the ATR Complex.
- 2. Worker Sprayed with Herbicide.
- 3. Tape Measurer Contacts Electrical Twist Lock Outlet.

After reviewing each event, there is no indication of an adverse trend or recurring problem associated with any of the events being reported as management concerns over the last 12 months.

TREND SNAPSHOT

Events Involving Subcontractors: Five (38%) of the reportable events this quarter involved subcontract employees. The number of reportable occurrences involving subcontractors is trending upwards. In comparison to INL's 38% of events involving subcontractors, only 11% of events occurring throughout the balance of the DOE Complex during the same time period involved subcontracted personnel.



There were 16 ORPS reportable events involving subcontractors during the past 12 months, including five this quarter. Those five events are as follows:

- The metal tape measurer that contacted an electrical outlet
- An electrical cabinet that was not properly posted or barricaded
- Problems identified during cask lifting operations at RHLLW
- An oven fire that resulted in a building evacuation
- Discovery of electrical energy on legacy circuits.

ANALYSIS FOR RECURRING EVENTS:

The events of the past year where subcontractors were involved were reviewed for similarities; none were identified. However, there is an indication of an adverse trend associated with subcontracted work. This potential trend will be evaluated next quarter and results published when they are available.

1st QUARTER FY-17 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 evaluate causes identified over the last 12 and 24 month periods. Cause codes are not required to be entered into ORPS for Significance Category 4 events, so data from those events is not included in this analysis. Data is also not included from those events that are not yet finalized in ORPS.

The analysis shows that the majority of causes over the last 12 months can be attributed to management problems (A4) and secondly to less-than-adequate human performance (A3). These criteria remain similar to the data reported last quarter. INL has seen an increase in events caused by management problems when comparing the past 12 months to the past 24 months. A comparison of the causes of INL events to the causes of events reported by the balance of the DOE Complex for the past two years show that 32% of the reportable events by the balance of the DOE Complex occurred due, in part, to management problems, followed by 22% of events caused by less-than-adequate human performance. These figures have remained somewhat unchanged for the last several reporting periods.

During FY-17, new metrics will be implemented that will enable INL to evaluate the effectiveness and the value of corrective action plans to ensure corrective actions are appropriate to reduce the risk and likelihood of similar events. When these metrics are implemented, INL will report on them via this report.



In addition to evaluating the cause of events, INL analyzes each reportable event to identify opportunities where the laboratory failed to effectively implement the five core functions of the Integrated Safety Management System (ISMS).

The chart to the right shows the ISMS analysis that has been documented for all reportable events occurring over two separate intervals—the past 12 months and the past 24 months. The chart also compares INL's reporting of ISMS failures to that of the balance of the DOE Complex.

For the purpose of the chart, ISMS Core Functions are defined as:

- 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, analysis shows that 47% of INL reportable events identified no known failures of the ISMS process. These primarily include events related to equipment problems and the discovery of suspect counterfeit parts. The analysis also shows that during the last 12 month period, failures most often occurred when analyzing hazards (ISMS Core Function 2) and performing work within controls (ISMS Core Function 4). This data is consistent over the last 24 months as well. Continued management oversight can help strengthen performance in these two areas and is a topic for discussion with the Operations Council.



The balance of the DOE Complex reported that the majority of problems occurred when implementing ISMS Core Function 4 - 28%, Core Function 3 - 21%, and Core Function 2 - 21%.

These metrics will continue to be monitored to ensure INL continues to effectively implement the ISMS program.



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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."