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DOE-ID Operations Summary  
For the Period April 1 to May 16, 2013

**EDITOR'S NOTE:** *The following is a summary of contractor operations at the Idaho National Laboratory, managed by DOE-Idaho Operations Office. It has been compiled in response to a request from stakeholders for more information on health, safety and environmental incidents at DOE facilities in Idaho. It also includes a brief summary of accomplishments at the Site. POC - Shannon Brennan, DOE-ID, (208) 526-3993.*

***Advanced Mixed Waste Treatment Project (AMWTP)***

April 15: (Notification) During Super Compactor Direct Feed operations, a discrepancy in fissile material values was noted between a drum barcode label and system data, resulting in a safety violation. This condition currently is being evaluated. [EM-ID--ITG-AMWTF-2013-0008]

April 16: (Notification) An operations technician injured his arm during the remote movement of a compacted drum at the Treatment Facility Super Compactor. The worker was attended to by facility medical personnel at the time of the injury. However, the condition worsened, eventually requiring treatment of ligament/tendon damage by the technician's personal physician. [EM-ID--ITG-AMWTF-2013-0009]

May 14: (Notification) A drum dislodged from the drum handling equipment and landed upright. There were no injuries, no drum damage, nor any contamination release. The drum was recovered and placed in a safe configuration. Because this was one of five drum handling events in the past six months, the recurrent nature warranted analysis for root cause and corrective actions which are underway. [EM-ID--AMWTF-2013-0010]

***Notable Accomplishments***

May 4: Twelve of 12 planned shipments of contact-handled (CH) transuranic (TRU) waste and two of two planned shipments of remote-handled (RH) TRU waste were made for the week ending May 4, 2013. Twelve shipments of CH TRU waste and two shipments of RH TRU waste were scheduled for the week ending May 11, 2013. The AMWTP is scheduled to ship twelve shipments per week throughout the month of May for disposal at the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico.

***Idaho Cleanup Project (ICP)***

April 16: (Notification/Final) An error in forms completion at CPP-666 Fuels Storage Facility caused two dissimilar fuel types to be stored in the same rack port. Fuel handling operations were suspended, and notifications were made. The condition was investigated, and a report was issued. The event is categorized as a deficiency; the currently stored fuel condition is safe. [EM-ID--CWI-FUELCSTR-2013-0001]

May 6: (Notification) A potential inadequacy in the safety analysis for the Idaho Waste Treatment Unit (IWTU) was declared due to the discovery of new information relative to the functional testing of the mercury adsorber inlet valves. The IWTU currently is shut down and has not processed any hazardous or radiological material. There was no potential for injury or release to the environment from this discovery. Related equipment has been tagged out of service until the required safety review is completed. [EM-ID--CWI-IWTU-2013-0003]

May 7: (Notification) A potential inadequacy in the safety analysis for the IWTU was declared due to the discovery of new information relative to the leakage of controlled steam block valves. The IWTU currently is shut down and has not processed any hazardous or radiological material. There was no potential for injury or release to the environment from this discovery. A review is underway. [EM-ID--CWI-IWTU-2013-0004]

### ***Notable Accomplishments***

April 29: For the second time in over a year, employees with DOE contractor CH2M-WG Idaho (CWI) supporting environmental management at the Idaho Site have achieved 1 million hours without a recordable injury. They also worked more than 1.7 million hours without a lost work-time injury.

### ***Idaho National Laboratory (INL)***

April 1: (Notification) A safety analysis package for a reactor experiment at the Advanced Test Reactor (ATR) was not verified adequately prior to reactor startup. This resulted from a failure to address thermal-hydraulic-calculated reactivity limits for the experiment. [NE-ID--BEA-ATR-2013-0010]

April 3: (Notification) An electrician performing work on an overhead fan at the Nuclear Materials Inspection and Storage (NMIS) Facility discovered a discrepancy and lack of isolation of power supply in the starter cabinet. Equipment lockout and tagout was performed, and work was stopped immediately. [NE-ID--BEA-ATR-2013-0011]

April 4: (Notification/Final) Operators noted an acrid odor within the Hot Fuel Examination Facility (HFEF) and appropriate notifications were made. The building alarm did not activate, although alarms to the fire department were received. Degraded alarm panels impairing notification were discovered. Personnel were instructed to use the manual alarm pull in the event of a concern and use the all-call voice paging for notifications in the meantime, if the building alarm does not sound. [NE-ID--BEA-HFEF-2013-0001]

April 8: (Notification/Final) While performing post-maintenance testing, a Materials and Fuels Complex (MFC) Neutron Radiography Reactor (NRAD) operator noticed that the regulating rod was drifting out without any operator action while leveling reactor power. The reactor operator manually shut down the reactor. The regulating rod was declared inoperable, and the reactor was placed in shut down. [NE-ID--BEA-NRAD-2013-0001]

April 15: (Notification) The ATR was shut down manually due to an imminent loss of diesel power based on an alarm from the M-6 diesel generator. The supply breaker to the motor control center powering the auxiliary systems for the generator was tripped. Because the generator was not receiving adequate cooling and was starting to overheat, the M-6 diesel tripped and power was lost to 670-E-3 diesel bus. Emergency procedures were used, power was restored to the E-3 diesel bus from commercial power, and equipment lost due to the power outage was restored. [NE-ID--BEA-ATR-2013-0012]

April 17: (Notification) As a uranium silicide ( $U_3Si_2$ ) compact was being removed from a poly bag under a hood, the compact began to glow red. A fire extinguishing agent was applied, the fire department responded, and the facility was evacuated. No fires resulted, no contaminated was detected, the hood flow was found to be within specifications, and the hood flow meter was functioning as designed. Normal facility access was restored. [NE-ID--BEA-FASB-2013-0001]

April 17: (Notification) Discrepancies were discovered both in the amount of polyethylene allowed by the hazard analysis document in MFC-784 (ZPPR Materials Control Building) as well as the form (nature of cladding) of beryllium stored in MFC-784. A critique was conducted. [NE-ID--BEA-ZPPR-2013-0001]

April 24: (Notification) Fissile material was discovered to be stored improperly in the MFC Fuels Manufacturing Facility (FMF) vault storage rack. A formal causal analysis to be performed. [NE-ID--BEA-FMF-2013-0003]

April 24: (Notification/Final) Three separate spurious Continuous Air Monitor (CAM) alarms activated at the Hot Fuel Examination Facility (HFEF) during a four hour period. Operations were stopped. An investigation revealed that environmental interference may have contributed to the CAMs' alarm actuation sensitivity. Options for alternative CAM types are under evaluation. [NE-ID--BEA-HFEF-2013-0002]

April 29: (Notification) The back of an electrical cabinet in the Radiological Controls Technician Office at the ATR was left off for troubleshooting. It was believed that this presented a condition which potentially could allow untrained workers to access a restricted approach boundary, in violation of National Fire Protection Association code. The area was secured, and safety signage was posted. Upon investigation, the exposed circuitry was found to be 24V and posed no threat to safety. [NE-ID--BEA-ATR-2013-0013]

May 1: (Notification) A walk-down of an electrical pull box located on the main floor of the ATR identified safety and non-safety-related cables in direct contact with each other, violating minimum separation requirements. Notifications were made. The reactor was in shutdown mode at the time of discovery. Facility operations were cleared to continue based on interim controls that were put into place. [NE-ID--BEA-ATR-2013-0014]

May 7: (Notification) An alarm was triggered by operations personnel at the MFC Casting Laboratory while securing an argon purge to a glove box. Personnel were evacuated. Upon confirmation of no oxygen deficient atmosphere, the areas were released and surveyed. No exposure or injuries occurred. [NE-ID--BEA-AL-2013-0001]

May 7: (Two) (Notification/Final) The ATR diesel generator 670-M-43 was started on two different occasions (May 3 for a post-maintenance test of the diesel governor, and May 7 for a commercial power under voltage relay set point test). Because the generator lacks requisite controls to be compliant with new emission standards for hazardous air pollutants, the State of Idaho Department of Environmental Quality was informed of it as a reportable non-compliance. All ATR diesel generators will be updated and fully compliant in 2015. [NE-ID--BEA-ATR-2013-0015] and [NE-ID--BEA-ATR-2013-0016], respectively.

May 8: (Notification/Final) An MFC fire systems notifier failed, presumably due to bad weather and, because timely notifications were not made, left the affected facilities vulnerable. As a result, until the

notifier is repaired, the schedule of area panel walk downs has been increased to hourly intervals. [NE-ID--BEA-MFC-2013-0002]

May 9: (Notification) Electric control cables for the Radiation Monitoring and Safety Seal systems in the Health Physics Monitoring Panel at the ATR were discovered to be in close proximity to non-safety-related cabling. This may not meet minimum separation requirements. Additionally, the related safety analysis takes credit for this condition to ensure that the ventilation supply and exhaust fans are shut off when radiation readings reach a given set point. Management was notified, and a reviewed was initiated. [NE-ID--BEA-ATR-2013-0017]

May 14: (Notification) An ATR engineer received what he thought was a shock from a portable boroscope. No evidence was found of a failure of the boroscope that would cause the shock, and initial conclusions pointed towards static buildup from the boroscope, compounded by the carpet and the footwear of the engineer as the cause. Later a broken ground wire was observed on the extension cord used by the engineer, resulting in 57 volts measured from the boroscope to ground. Further investigation has been initiated. [NE-ID--BEA-ATR-2013-0018]

### ***Notable Accomplishments***

April 9: Giving Industry Access to National Laboratory Capabilities – Universities have many opportunities for access to research facilities, but private industry has fewer options when complex, high-end capabilities are needed to advance new technology. That is where public resources such as the U.S. Department of Energy's national laboratory complex play a role.

Many of the national research capabilities that are unique to nuclear energy reside at the Idaho National Laboratory, the nation's lead nuclear energy lab. DOE made these capabilities more accessible to university research teams by establishing a National Scientific User Facility around INL's Advanced Test Reactor. Now, a new set of Advanced Test Reactor National Scientific User Facility (ATR NSUF) experiments is demonstrating how industry researchers also can access INL's distinctive capabilities.

Two research projects with the Electric Power Research Institute (EPRI) - a nonprofit research, development and demonstration organization for the electric utility industry - are directly supporting our nation's nuclear energy industry. Both experiments are cooperative research and development agreements that allow ATR NSUF and EPRI to share information and costs for the projects. One project will provide data that could help increase the robustness of cladding materials that surround and isolate nuclear fuel. Another supports nuclear reactor relicensing efforts by boosting understanding of factors that can limit the lifetimes of reactor structural materials. The projects build on work the ATR NSUF has been doing to enhance relevance for industry.

April 22: Advancing a National Electric Grid Reliability Test Bed – Solar flares and sunspot cycles could disturb or even interrupt power and communications systems for extended periods of time. That has been the concern of many federal agencies, the U.S. Congress and especially the House Homeland Security Subcommittee on Cyber security, Infrastructure Protection and Security Technologies.

"This year, 2013, is projected to be a period of maximum activity in the current solar storm cycle," said Dr. Carl Kutsche, who manages Strategic Technology Integration at Idaho National Laboratory. "Although the current solar cycle is predicted to be less intense on average than previous cycles, solar activity spikes that occur during the maximum of any cycle can be significant. These intense spikes have

been responsible for disruption and damage to electrical grids in the past, even causing damage to transformers and interrupting grid operations."

During the past decade, many researchers have been modeling and evaluating damage caused by solar storms. Small-scale testing has replicated some but not all of the effects that models have predicted. Full-scale testing is needed to validate impacts, as well as the effectiveness of mitigation measures, but this level of testing requires an entire metropolitan power grid. No commercial grid can risk this level of testing, as it may impact energy delivery to the nation. The U.S. Department of Energy's INL, however, maintains a metropolitan-scale energy grid for such testing: the National Electric Grid Reliability Test Bed.

"Recently, the INL performed full-scale testing, the first such testing that replicates the exact conditions utility users would experience on the electric grid from solar storms," said INL Power Systems Program Manager Scott McBride. "These tests not only confirmed model predictions of power interruption and equipment damage, they also revealed several other unexpected secondary effects that must be taken into account."

May 5: MOOSE Simulation Environment Fosters a Herd of Modeling Applications – Modeling and simulation has now become standard practice in nearly every branch of science. Building a useful simulation capability has traditionally been a daunting task because it required a team of software developers working for years with scientists to describe a given phenomenon.

Idaho National Laboratory's MOOSE (Multi physics Object Oriented Simulation Environment) now makes modeling and simulation more accessible to a broad array of scientists. MOOSE enables simulation tools to be developed in a fraction of the time previously required. The tool has revolutionized predictive modeling, especially in the field of nuclear engineering — allowing nuclear fuels and materials scientists to develop numerous applications that predict the behavior of fuels and materials under operating and accident conditions.