



Department of Energy
Washington, DC 20585

January 13, 2012

Mr. John J. Grossenbacher
President and Laboratory Director
Battelle Energy Alliance, LLC
2525 North Fremont Avenue
Idaho Falls, Idaho 83415-3695

NCO-2012-01

Dear Mr. Grossenbacher:

The Office of Health, Safety and Security's Office of Enforcement and Oversight has completed its investigation into the facts and circumstances associated with the inadvertent draining of water from the reactor vessel at the Idaho National Laboratory Advanced Test Reactor (ATR), which occurred during a maintenance outage on June 1, 2011. This occurrence was reported in Noncompliance Tracking System report NTS-ID--BEA-ATR-2011-0003, *Low Level in Advanced Test Reactor (ATR) Vessel*.

This event, which involved the inadvertent draindown of approximately half the reactor vessel coolant inventory above the fuel, went unrecognized by the reactor control room operators for approximately two hours, but did not result in any adverse effects on workers, the public, or ATR systems or components. Nevertheless, the U.S. Department of Energy (DOE) considers this event to be of high nuclear safety significance. Battelle Energy Alliance's (BEA) investigation into this event identified deficiencies in the execution of conduct-of-operations principles, conveyance of management expectations for disciplined ATR operations, procedure content, and allocation of resources to support plant startup. BEA also identified an erroneous perception by ATR staff that a shutdown plant represents minimal risk; this perception contributed to the initiation and progression of the draindown event.

DOE has evaluated BEA's investigation and causal analysis of the event and finds them to be comprehensive and appropriately self-critical. Similarly, the identified corrective actions are appropriately linked to BEA's analysis. DOE is also aware that, in recognition of the need to improve ATR performance, BEA had in place several long-term performance improvement initiatives at the time of the event, including hiring managers with significant commercial nuclear experience and



utilizing the operational expertise available from the Institute of Nuclear Power Operations. However, these improvement efforts did not prevent the June 1, 2011, draindown event.

DOE recognizes that BEA senior management understands the significance of this event and is committed to the effective implementation of a disciplined nuclear operations philosophy at ATR. However, DOE is concerned that this commitment may not be uniformly shared by ATR mid-level managers and supervisors, and BEA needs to ensure that the corrective action plan addresses the reinforcement of senior management's expectations at all levels of the ATR organization. Finally, given the significant contribution of operator distractions and burden to the progression of this event, DOE believes that BEA needs to accelerate implementation of its proposed outage control center concept at ATR and ensure that operator burden is evaluated and addressed in BEA's extent-of-condition analysis.

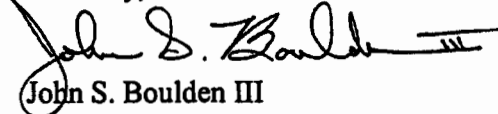
In accordance with 10 C.F.R. § 820.23, the Office of Enforcement and Oversight has exercised its enforcement discretion to resolve these potential noncompliances through a Consent Order. In choosing to enter into this Consent Order, considerable weight was placed on the ATR improvement initiatives already under way at the time of the event. Absent these efforts, it is highly unlikely that DOE would have agreed to a settlement.

DOE reserves the right to reinstate enforcement proceedings against BEA if DOE later becomes aware of any false or materially inaccurate facts or information provided by BEA. Further, if there is a recurrence of nuclear safety deficiencies similar to those identified above, or a failure to complete all corrective actions prescribed in the Consent Order (or other related actions that BEA subsequently determines to be necessary) to prevent recurrence of the identified issues, the Office of Enforcement and Oversight may decide to pursue additional enforcement activity. The Office of Enforcement and Oversight, the Office of Nuclear Energy, and the Idaho Operations Office will continue to closely monitor BEA's implementation of DOE's nuclear safety requirements at ATR and at other INL nuclear facilities.

Enclosed are two signed copies of the Consent Order. Please sign both, keep one for your records, and return the other copy to this office within 1 week from the date of receipt. By signing this Consent Order, BEA agrees to remit a sum of \$250,000, payable to the Treasurer of the United States, in accordance with the directions in the enclosed Consent Order and to perform the actions specified in section IV of the Consent Order.

Should you have any questions, please contact me at (301) 903-2178, or your staff may contact Mr. Steven Simonson, Deputy Director for Enforcement, at (301) 903-7707.

Sincerely,

A handwritten signature in black ink, appearing to read "John S. Boulden III". The signature is written in a cursive style with a large initial "J" and a distinct "III" at the end.

John S. Boulden III

Director

Office of Enforcement and Oversight

Office of Health, Safety and Security

Enclosure: Consent Order (NCO-2012-01)

cc: Richard Provencher, ID
Alan Wagner, BEA

In the matter of) Report No. NTS-ID--BEA-ATR-2011-0003
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Battelle Energy)
Alliance, LLC)
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) Consent Order NCO-2012-01

CONSENT ORDER INCORPORATING AGREEMENT BETWEEN
U.S. DEPARTMENT OF ENERGY AND BATTELLE ENERGY ALLIANCE, LLC

I

Battelle Energy Alliance, LLC (BEA), is responsible for the operation and maintenance of the Advanced Test Reactor (ATR), which is located at the ATR complex at the Idaho National Laboratory (INL). The ATR is a Department of Energy (DOE)-owned hazard category 1 nuclear facility whose principal function is to provide high neutron flux for testing reactor fuels and other materials. BEA conducts ATR operations and maintenance activities at the Idaho National Laboratory under Contract No. DE-AC07-05ID14517 (Contract) for the DOE Idaho Operations Office (DOE-ID).

II

On June 1, 2011, with the ATR in a planned shutdown condition and with the reactor fueled, an Equipment Operator repositioned a valve as part of startup preparations, inadvertently causing reactor coolant water to drain from the reactor to an auxiliary vessel. ATR control room personnel did not detect the draindown of reactor coolant water for more than 2 hours. Upon detecting the low water level in the reactor (after draining approximately half of the reactor vessel coolant inventory above the fuel), ATR personnel isolated the drain path and reestablished the appropriate water level.

BEA's causal analysis of this event determined that the causes included inadequate procedures (which led to the valve misalignment) and management's acceptance of behaviors that did not meet expectations for conduct of operations at a nuclear reactor facility. Specific deficiencies in nuclear operations included: (1) poor monitoring of critical reactor parameters, (2) deficient reactor control room (RCR) alarm response, (3) inadequate turnovers and log keeping within the RCR, (4) inadequate communication between operators manipulating equipment outside the RCR and personnel inside the RCR, (5) the shift supervisor being distracted by other

responsibilities and not maintaining proper awareness of reactor parameters, and (6) management not being properly focused on acceptable operator performance and not reinforcing the expectations for disciplined nuclear operations.

Before the June 1, 2011, event, BEA was aware of deficiencies at the ATR related to the conduct of nuclear operations and had taken corrective actions to address these deficiencies. Two of the more important initiatives were to hire personnel with significant commercial nuclear experience for managerial positions at the ATR and to utilize the operational expertise available from the Institute of Nuclear Power Operations. However, these improvement initiatives did not prevent the June 1, 2011, event.

BEA voluntarily reported potential noncompliances with DOE nuclear safety requirements associated with the event into DOE's Noncompliance Tracking System (NTS) in report NTS-ID--BEA-ATR-2011-0003, *Low Level in Advanced Test Reactor (ATR) Vessel*.

In August 2011, pursuant to 10 C.F.R. § 820.21(a), and based on the NTS report and discussions with DOE-ID, the Office of Enforcement and Oversight initiated an investigation into the June 1, 2011, event. The Office of Enforcement and Oversight's investigation identified several potential noncompliances with DOE nuclear safety requirements. Specific deficiencies were evident in the areas of quality improvement, staffing, documents and records, work processes, and management/independent assessments.

In an August 29, 2011, letter to the Office of Enforcement and Oversight, BEA requested a Consent Order based on the following: (1) the absence of an impact on plant personnel or the public, (2) timely reporting, (3) thorough investigation, and (4) comprehensive root cause analysis and corrective action development to address the nuclear safety deficiencies identified above.

III

Pursuant to 10 C.F.R. § 820.23, at any time during enforcement proceedings, DOE may resolve any or all issues with a Consent Order if the settlement is consistent with the objectives of the Atomic Energy Act of 1954, as amended, and DOE nuclear safety requirements.

To resolve the potential noncompliances with 10 C.F.R. Part 830 requirements and in consideration of BEA's request for settlement and BEA's investigation, causal analyses, and associated corrective actions taken before and since the submission of the NTS report referenced above, DOE has elected to enter into settlement. DOE and BEA have reached agreement to resolve this matter through execution of this Consent Order.

IV

Accordingly, the terms of this Consent Order are as follows:

In consideration of the mutual agreements set forth in this section, the sufficiency and adequacy of which are acknowledged by DOE and BEA, the following terms represent agreement by the

authorized representatives of DOE and BEA to resolve by settlement the potential noncompliances at the ATR, in lieu of an enforcement action that DOE may issue pursuant to 10 C.F.R. § 820.24.

1. BEA shall include the following enhancements in their corrective action plans and provide the specified deliverables:
 - (a) BEA agrees that current barriers to implementation of senior management expectations for performance must be removed. BEA shall ensure that all levels of ATR management (Operations Maintenance, Engineering, Radiological Controls, and support organizations), from the first-line supervisors to the ATR station manager, understand, demonstrate ownership of, and reinforce to staff both the standard for conduct of operations performance and safety culture principles. Management shall ensure that operators clearly understand that schedules are flexible and safety shall not be compromised to fulfill a production schedule. Within 120 days of the effective date of this Consent Order, BEA shall provide to the Office of Enforcement and Oversight and DOE-ID documentation that actions have been taken or are specifically delineated in corrective action plans to address these areas of needed improvement.
 - (b) BEA agrees that shift supervisors and ATR mid-level managers must regularly and effectively reinforce expected behaviors to the operating crews, maintenance staff, and support organizations. Several of the corrective actions for the vessel draindown event focus on improving workers' understanding of senior ATR management's expectations for conduct of operations and watch-stander fundamentals. The "Immediate Actions" that BEA has identified include a plan for continuing management oversight, including on weekends and backshift, but unless the contractor improves the effectiveness of its mechanisms for reinforcing senior management's expectations for ATR staff performance, performance may revert to the level to which workers had become accustomed. Within 120 days of the effective date of this Consent Order, BEA shall provide to the Office of Enforcement and Oversight and DOE-ID documentation that actions have been taken or are specifically delineated in corrective action plans to address this area of concern.
 - (c) BEA agrees that management must effectively communicate expectations for permitted activities (performing procedures, keeping logs, etc.) and prohibited activities for workers assigned to a particular watch station. BEA shall evaluate performance-improvement actions for applicability and benefit to all ATR watch stations and to other key watch stations across INL (including but not limited to the Material and Fuels Complex and the Specific Manufacturing Capability), with the goal of removing distractions and operator burden for reactor operators and experiment operators when at the controls. Within 120 days of the effective date of this Consent Order, BEA shall provide to the Office of Enforcement and Oversight and DOE-ID documentation that actions have been taken or are specifically delineated in corrective action plans to address this area of needed improvement.

- (d) Before the next scheduled ATR outage, BEA shall implement corrective action AI-05438 (*Implement Issues and Corrective Action Management System*), which establishes an Outage Control Center (OCC), and provide documentation of OCC implementation to the Office of Enforcement and Oversight and DOE-ID. The goal of the OCC is to minimize distractions for the RCR personnel and operating crew so that they can focus on reactor monitoring and operations. BEA shall use nuclear industry benchmarking of OCC procedures to ensure that the OCC concept is properly implemented.
- (e) BEA will arrange for an independent party (outside of BEA) to conduct an effectiveness review of the corrective actions taken to address these issues, and provide the results to the Office of Enforcement and Oversight and DOE-ID.
2. BEA shall pay the amount of \$250,000, reflecting an agreed-upon monetary remedy in lieu of the issuance of an enforcement action with imposition of a civil penalty pursuant to 10 C.F.R. § 820.24.
 3. BEA agrees to return a signed copy of this Consent Order, within 1 week from the date of receipt, to the address provided in item 5 below.
 4. The effective date of this Consent Order shall be the date upon which BEA signs this Consent Order.
 5. BEA shall remit the monetary remedy of \$250,000 by check, draft, or money order payable to the Treasurer of the United States (Account Number 891099) within 30 calendar days after the effective date of this Consent Order. Payment shall be sent by overnight carrier to:

Director, Office of Enforcement and Oversight
Attention: Office of the Docketing Clerk, HS-40
U.S. Department of Energy
19901 Germantown Road
Germantown, MD 20874-1290
 6. This Consent Order shall constitute a full and final settlement of the potential noncompliances identified in the referenced NTS report, subject to: (a) BEA's payment of the monetary remedy in accordance with item 5, above, (b) BEA's completion of all actions set forth in item 1 in the manner prescribed therein, and (c) the provisions of item 12, below.
 7. Pursuant to the Major Fraud Act, as amended, 41 U.S.C. § 4310, and the implementing provisions of the Federal Acquisition Regulation, 48 C.F.R. § 31.205-47, neither the monetary remedy nor costs incurred by, for, or on behalf of BEA relating to coordination and cooperation with DOE concerning the investigation of matters covered by this Consent Order shall be considered allowable costs under the Contract.
 8. This Consent Order does not preclude DOE from re-opening the investigation or issuing an enforcement action under 10 C.F.R. § 820.24 with respect to a potential noncompliance if: (a) after the effective date (as defined in item 4 above), DOE becomes aware of any false

or materially inaccurate facts or information provided by BEA; (b) there is a recurrence of nuclear safety deficiencies similar to those identified above; or (c) BEA fails to complete all actions identified in item 1 in the manner prescribed therein.

9. Any modification to this Consent Order requires the written consent of both DOE and BEA.
10. BEA waives any and all rights to appeal or otherwise seek judicial or administrative review of the terms of this Consent Order. DOE retains the right to judicially enforce the provisions of this Consent Order by all legal means.
11. This Consent Order is issued pursuant to DOE's authority under Section 234A of the Atomic Energy Act of 1954, as amended (42 U.S.C. § 2282a), and the implementing provisions of 10 C.F.R. Part 820 governing the enforcement of DOE nuclear safety requirements.
12. Pursuant to 10 C.F.R. § 820.23(d), this Consent Order shall become a Final Order 30 calendar days after the signed copy, referenced in item 3 above, is filed by the Office of Enforcement and Oversight's Office of the Docketing Clerk unless the Secretary of Energy files a rejection of the Consent Order or a Modified Consent Order.

On behalf of my respective organization, I hereby agree to and accept the terms of the foregoing Consent Order.

FOR U.S. Department of Energy:

FOR Battelle Energy Alliance, LLC:

 Date 1/13/2012

John S. Boulden III
Director
Office of Enforcement and Oversight
Office of Health, Safety and Security
U.S. Department of Energy

 Date 1/17/2012

John J. Grossenbacher
Director, Idaho National Laboratory
and President, Battelle Energy Alliance, LLC