



## Department of Energy

Washington, DC 20585

July 30, 2013

Mr. Steve Moore  
President and Chief Executive Officer  
Wastren Advantage, Inc.  
1571 Shyville Road  
Piketon, Ohio 45661

WEL-2013-02

Dear Mr. Moore:

The U.S. Department of Energy (DOE) Office of Health, Safety and Security's Office of Enforcement and Oversight evaluated the facts and circumstances surrounding a loss of breathing air within the Box Breakdown Area (BBA) of the Transuranic Waste Processing Center (TWPC), which led to the expedited egress of two workers in supplied-air suits and one worker in a supplied-air hood. Wastren Advantage, Inc. (WAI) manages and operates the TWPC, located in Oak Ridge, Tennessee, under a contract with DOE and is subject to the provisions of DOE's *Nuclear Safety Management* rule pursuant to 10 C.F.R. Part 830 and DOE's *Worker Safety and Health Program* rule pursuant to 10 C.F.R. Part 851.

WAI documented this event in the DOE Occurrence Reporting and Processing System (ORPS) (EM-ORO--WAI-TWPC-2013-0004) on March 11, 2013, and WAI reported the 10 C.F.R. Part 830 noncompliances associated with this event in the DOE Noncompliance Tracking System (NTS) (NTS-ORO-WAI--TWPC-2013-0002) on April 1, 2013. The incident is associated with a breathing air system (BAS) in the BBA that consists of two compressors, an air-cooled aftercooler system, an environmental chiller, a water-cooled aftercooler system, and emergency air bottles. The water-cooled aftercooler system relies on the environmental chiller for operation. At the time of the incident, the environmental chiller had been out of service since December 2012, rendering the water-cooled aftercooler system inoperable.

Before BBA operations began on the afternoon of March 7, 2013, the BBA Floor Supervisor tasked the BAS Operator to place the air-cooled aftercooler system online. The BAS Operator misunderstood the assignment and placed the water-cooled aftercooler system online. Two Waste Operators and one Radiation Control Technician (RCT) later entered the BBA to perform waste process operations in supplied-air suits and/or hoods. About 30 minutes into the processing, the workers complained that they were hot inside the suits/hoods. Under the direction of the BBA Floor Supervisor, the BAS Operator used procedure CH-UET-OP-033, revision 2, dated March 5, 2013, *Continuous Flow Breathing Air Purifier*, in order to switch from the inoperative water-cooled aftercooler system to the operative air-cooled aftercooler system. Due to a lack of strict procedural adherence, the BAS Operator subsequently



isolated the primary breathing air along with the emergency backup air bottle system, leaving the three workers without breathing air. Over the next three minutes, the workers made an expedited egress from the BBA. One worker (who remained conscious but felt disoriented and had an elevated heart rate) had to be rapidly cut out of his suit by the assigned cut-out RCT.

The loss of breathing air event revealed potential violations of Parts 830 and 851 requirements and the Part 851 invoked standards, including 29 C.F.R. Part 1910, *Occupational Safety and Health Standards*. WAI identified noncompliances in the nuclear safety management program areas of work processes and design. The Office of Nuclear Safety Enforcement identified potential noncompliances in two additional nuclear safety management program areas: quality improvement, and training and qualification. The Office of Worker Safety and Health Enforcement also identified potential noncompliances related to WAI's worker safety and health program in the areas of hazard identification and assessment, hazard prevention and control, and worker training. Specific examples include:

- WAI used an inadequate BAS design to supply breathing air to personnel in a radiological environment with known airborne particulates and inhalation hazards. Both the water-cooled and air-cooled aftercooler systems were installed downstream of the BAS emergency backup air bottle system, allowing a single failure to cause a complete loss of breathing air to BBA personnel. According to the WAI investigation report, installing the water-cooled and air-cooled aftercooler systems upstream of the BAS emergency backup air bottle system would have greatly reduced the potential for losing secondary air upon loss of primary air. Additionally, inadequate BAS design resulted in the suboptimal placement of the emergency alarms that prevented the alarm system from detecting the loss of air and subsequently actuating the audible horns as expected. While the design configuration of the BAS alarm system has the potential to delay the egress of personnel during a loss of breathing air event, there is no evidence to suggest that BAS alarm system delayed egress in this particular event.
- WAI used inadequate procedures that allowed manipulation of the BAS valves while the continuous flow breathing air purifier system was operating and BBA personnel were on breathing air, as recognized by the WAI investigation report. WAI did not adequately consider the potential workplace hazards in its underlying analysis of modifications to BAS equipment during operation, increasing the likelihood of isolating emergency backup air from the BBA and possibly depriving the workers of oxygen.
- WAI did not effectively characterize the significance of the BAS for worker safety, resulting in inadequate staff training and qualification on its use, operation, and maintenance. WAI initially trained and certified the Floor Supervisor and BAS Operator in September 2007 and January 2008, respectively, and assigned required reading whenever WAI revised the BAS procedures. WAI's extent-of-condition report identified that the BAS air cooler alignment was an infrequently performed evolution with the potential, due to lack of familiarity, to result in an upset condition, and that more broadly, seventeen operations procedures that could

impact the environment, worker health and safety, or quality were identified with sections that could be susceptible to incorrect performance due to lack of familiarity. The WAI investigation report also noted that it “had been over a year since [the BAS] Operator had manipulated the system valves.” Additionally, the BAS did not have a cognizant system engineer assigned or have qualified operations individuals assigned as subject matter experts, nor was the system designation at “the equivalent of existing safety significant systems, structures, or components.”

- WAI did not adequately develop and emphasize to the staff the need to adhere to procedures/checklists and the expectation to stop work when the procedure is not correct or the system is in an inappropriate or unanalyzed condition. The WAI investigation report stated that the BAS Operator should have performed the procedural step as written or stopped work and notified the Floor Supervisor of the valve misalignment. If the BAS Operator had followed the procedure or stopped work, the event would not have occurred. In 2012, two additional ORPS reported events were attributed to a worker not following a procedure verbatim (EM-ORO--WAI-TWPC-2012-0003, *Violation of Technical Safety Requirement for Drum Lid Restraint*, and EM-ORO--WAI-TWPC-2012-0004, *Failure to Apply Lockout/Tagout to Inlet and Outlet Valves of the Plant Air Compressor Coalescing Filter*).
- WAI did not effectively train workers to cease work and start egressing immediately upon loss of primary air, nor did management effectively communicate expectations regarding priorities in potentially life-threatening situations. Emergency response drills were not conducted periodically to simulate the actual conditions of the work environment, and workers did not completely understand the categorization and prioritization of the varied hazards of their work environment. The WAI investigation report states that “BBA personnel should have reacted immediately upon detection of loss of air supply,” “BBA personnel were not trained with a prepared response,” and “the response that was taken was unrehearsed.” The report also states that “[the] BBA RCT should have immediately started his egress without bending over to pick up the dropped instrument” and that “BBA Operator 2 should have made his egress without moving the drum [or] closing the bi-fold doors.” The delay deprived both BBA Operator 2 and the RCT of air longer than necessary.
- WAI did not adequately establish and implement processes to detect and prevent quality problems in the BAS. WAI did not identify the causes of problems and take steps to prevent recurrence as part of correcting the identified problems in work processes, conduct of operations, and procedural adherence related to a 2012 occurrence (EM-ORO--WAI-TWPC-2012-0003). WAI failed to identify deficiencies in system design, procedural adherence, or worker training and qualification following a BAS-related occurrence in the BBA in 2012 (EM-ORO--WAI-TWPC-2012-0004). DOE expects corrective actions to be based, as appropriate, on detailed extent-of-condition reviews and root cause analyses, and to focus on preventing recurrence of similar problems in the future.

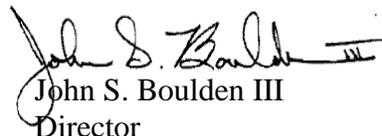
As part of the regulatory screening process, WAI should consider the Part 851 noncompliances associated with this event in addition to the Part 830 noncompliances that WAI cited in its initial NTS report. For this event and any future occurrences that affect both nuclear safety and worker safety and health, WAI should ensure that all applicable Part 851 citations are also considered when developing root cause analyses, extent-of-condition reviews, and associated corrective action plans. It is important for WAI to recognize the full scope of noncompliances in its initial considerations so that WAI can address all applicable program areas when identifying the root and contributing causes and subsequently developing comprehensive corrective actions to prevent recurrence.

The Office of Enforcement and Oversight is issuing this enforcement letter to highlight concerns about the effectiveness of WAI's nuclear safety management and worker safety and health programs. The facts and circumstances of this occurrence indicate programmatic weaknesses in multiple aspects of WAI's safety program. Additionally, several recent, related occurrences may indicate a negative trend in the areas of conduct of operations and work processes that warrant your continued attention and focus.

The Office of Enforcement and Oversight recognizes WAI senior management for its open and candid engagement and for its prompt and proactive analysis and reporting of the event. Despite the deficiencies revealed by this event, the Office of Enforcement and Oversight is electing to exercise enforcement discretion at this time based on the compensatory actions instituted immediately after the event, the completion of a thorough and wide-ranging investigation report that identified causal factors, and the development of comprehensive and conservative corrective actions to prevent recurrence. The Office of Enforcement and Oversight and the DOE Oak Ridge Office of Environmental Management (OREM) will continue to closely monitor the effectiveness of WAI's nuclear safety and worker safety and health programs in preventing worker exposures to workplace hazards in a nuclear environment.

No response to this letter is required. If you have any questions, please contact me at (301) 903-2178, or your staff may contact Mr. Steven Simonson, Deputy Director, Office of Enforcement and Oversight, at (301) 903-7707 or Mr. Kevin Dressman, Director, Office of Worker Safety and Health Enforcement, at (301) 903-0100.

Sincerely,



John S. Boulden III

Director  
Office of Enforcement and Oversight  
Office of Health, Safety and Security

cc: Mark Whitney, OREM  
Sam Burns, WAI