



**Department of Energy**  
**Under Secretary for Nuclear Security**  
**Administrator, National Nuclear Security Administration**  
**Washington, DC 20585**



May 27, 2015

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Mr. David J. Richardson  
President and General Manager  
Babcock & Wilcox Technical Services Y-12, LLC  
11525 North Community House Road, Suite 600  
Charlotte, North Carolina 28277

WEA-2015-03

Dear Mr. Richardson:

This letter refers to the Department of Energy's (DOE) investigation into the facts and circumstances associated with two events at the Y-12 National Security Complex (Y-12): a worker exposure to lithium hydride (LiH) and the unintentional discharge of a firearm inside a hardened patrol vehicle. The results of the investigation were provided to Babcock & Wilcox Technical Services Y-12, LLC (B&W Y-12) in an investigation report dated July 28, 2014. DOE convened an enforcement conference on October 22, 2014, with you and members of your staff to discuss the report's findings and B&W Y-12's response. A summary of the conference and list of attendees is enclosed.

The National Nuclear Security Administration (NNSA) considers both events to be of high safety significance. During the LiH event, a worker received first and second-degree burns to the face and scalp, as well as respiratory injury, when residual LiH powder vented from the West Machine Dust Station recycling system during post-work testing. The firearm discharge event, which resulted in minor injury to two Security Police Officers (SPO), potentially could have led to a fatality when a 240B machine gun discharged a single armor piercing round that impacted the interior wall of the vehicle, producing fragmentation. The two SPOs received first aid onsite and were transported to the hospital where they were treated and released.

The events revealed deficiencies in training and information; personal protective equipment; control of hazardous energy; firearms operations; firearms handling; and recordkeeping.

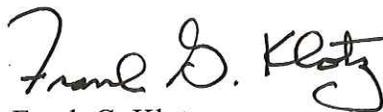
Based on an evaluation of the evidence in this matter, NNSA has concluded that violations of 10 C.F.R. Part 851 (Part 851), *Worker Safety and Health Program*, by B&W Y-12 have occurred. Accordingly, NNSA is issuing the enclosed Preliminary Notice of Violation (PNOV), which cites five Severity Level I violations and one Severity Level II violation with a total proposed base civil penalty, before mitigation, of \$412,500.



B&W Y-12 promptly responded to the events. Operations involving the LiH machine dust station were halted and corrective actions were identified, including design changes to address possible failure modes for blocked vent paths and possible inert purge deficiencies. NNSA also acknowledges procedural improvements that B&W Y-12 made to address the gun discharge event, including modifications to procedures for weapons configuration. In recognition of B&W Y-12's responses to the events and corrective actions, NNSA has incorporated 50 percent mitigation for two Severity Level I violations associated with the LiH event, and for the firearm discharge event, 50 percent mitigation for two Severity Level I violations and 25 percent mitigation for the Severity Level II violation. Because B&W Y-12 did not recognize or address the hazardous energy control violation associated with the LiH event, NNSA did not mitigate the civil penalty for that Severity Level I violation. Also, NNSA specifically considered the firearms incident in issuing award fee during this timeframe, and therefore NNSA is not issuing a civil penalty for that incident. As a result, the total proposed civil penalty is \$150,000.

Pursuant to 10 C.F.R. § 851.42, *Preliminary Notice of Violation*, you are obligated to submit a written reply within 30 calendar days of receipt of the enclosed PNOV and to follow the instructions specified in the PNOV when preparing your response. If no reply is submitted within 30 calendar days, in accordance with 10 C.F.R. § 851.42(d), you relinquish any right to appeal any matter in the PNOV, and the PNOV will constitute a final order.

Sincerely,



Frank G. Klotz

Enclosures: Preliminary Notice of Violation (WEA-2015-03)  
Enforcement Conference Summary and List of Attendees

cc: Steven Erhart, NA-1.1  
Geoffrey Beausoleil, NPO  
Kimberly Fee, B&W Y-12

Enclosure 1

### Preliminary Notice of Violation

Babcock & Wilcox Technical Services Y-12, LLC  
Y-12 National Security Complex

WEA-2015-03

The U.S. Department of Energy (DOE) conducted an investigation into the facts and circumstances associated with two events at the Y-12 National Security Complex. The events included worker exposure to lithium hydride (LiH) on April 3, 2013, and the unintentional discharge of a firearm inside a hardened patrol vehicle on July 28, 2013. The investigation identified multiple violations of DOE worker safety and health requirements by Babcock & Wilcox Technical Services Y-12, LLC (B&W Y-12). Violations associated with the events involved deficiencies in training and information; personal protective equipment; control of hazardous energy; firearms operations; firearms handling; and recordkeeping.

Pursuant to section 234C of the Atomic Energy Act of 1954, as amended, and 10 C.F.R. Part 851 (Part 851), *Worker Safety and Health Program*, the National Nuclear Security Administration (NNSA) hereby issues this Preliminary Notice of Violation (PNOV) to B&W Y-12. NNSA has grouped and categorized the violations as five Severity Level I violations and one Severity Level II violation. NNSA is proposing a total civil penalty of \$150,000 for the LiH incident. However, NNSA specifically considered the firearms incident in issuing award fee during this timeframe, and therefore NNSA is not issuing a civil penalty for that incident.

As explained in 10 C.F.R. Part 851, Appendix B, *General Statement of Enforcement Policy*, § VI(b)(1), “[a] Severity Level I violation is a serious violation. A serious violation shall be deemed to exist in a place of employment if there is a potential that death or serious physical harm could result from a condition which exists, or from one or more practices, means, methods, operations, or processes which have been adopted or are in use, in such place of employment.” Section VI(b)(2) provides that “[a] Severity Level II violation is an other-than-serious violation. An other-than-serious violation occurs where the most serious injury or illness that would potentially result from a hazardous condition cannot reasonably be predicted to cause death or serious physical harm to employees but does have a direct relationship to their safety and health.”

As required by 10 C.F.R. § 851.42(b) and consistent with Part 851, Appendix B, the violations are listed below.

#### I. VIOLATIONS

## A. Lithium Hydride Event

### 1. Training and Information

Title 10 C.F.R. § 851.10, General requirements, subsection (a), states that “[w]ith respect to a covered workplace for which a contractor is responsible, the contractor must: . . . (2) [e]nsure that work is performed in accordance with: (i) [a]ll applicable requirements of [10 C.F.R. Part 851]; and (ii) [w]ith the worker safety and health program for that workplace.”

Title 10 C.F.R. § 851.25, *Training and Information*, subsection (a), states that “[c]ontractors must develop and implement a worker safety and health training and information program to ensure that all workers exposed or potentially exposed to hazards are provided with the training and information on that hazard in order to perform their duties in a safe and healthful manner.”

Contrary to these requirements, B&W Y-12 failed to adequately communicate workplace hazards to ensure that post work testing (PWT) of the LiH West Machine Dust (MD) Station could be performed safely and in accordance with *B&W Y-12 10 CFR Part 851 Worker Safety and Health Program* (Y73-004PD, dated May 25, 2011). Specific examples include the following:

- a. B&W Y-12 did not ensure that workers were aware of the condition of the equipment and the increased hazard associated with the excess LiH in the recycling system. The pre-job briefing did not address the fact that earlier LiH processing had not been completed and that excess LiH powder remained in the chute, and adequately communicate the resulting LiH exposure hazard. This factor directly contributed to the lack of concern on the part of the Operator regarding the exposure hazard.
- b. B&W Y-12 did not clearly communicate expectations for work performance. Management personnel stated that the maintenance activity on the West MD Station was expected to stop prior to PWT. However, that information was not identified on work order 50447682, *Clean Out West MD Station*, dated April 1, 2013, or communicated to the personnel performing the work. Work order 50447682 only specified the performance of PWT and did not include any provision to stop work following completion of cleanout operations.

This noncompliance constitutes a Severity Level I violation.  
Base Civil Penalty - \$75,000  
Proposed Civil Penalty (as adjusted) - \$37,500

## 2. Personal Protective Equipment

Title 10 C.F.R. § 851.23, *Safety and health standards*, at paragraph (a)(3), requires contractors to comply with 29 C.F.R. Part 1910, *Occupational Safety and Health Standards*, excluding 29 C.F.R. 1910.1096, *Ionizing Radiation*.

Title 29 C.F.R. § 1910.132, *General requirements*, subsection (a), *Application*, states that “[p]rotective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation, or physical contact.”

Title 29 C.F.R. § 1910.132, at paragraph (d)(1), states that “[t]he employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or likely to be present, the employer shall: (i) [s]elect, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment; (ii) [c]ommunicate selection decisions to each affected employee; and (iii) [s]elect PPE that properly fits each affected employee.”

Title 29 C.F.R. § 1910.133, *Eye and face protection*, subsection (a), *General requirements*, paragraph (1), states that “[t]he employer shall ensure that each affected employee uses appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.”

Title 29 C.F.R. § 1910.134, *Respiratory protection*, subsection (a) *Permissible practice*, paragraph (2), states that “[a] respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protection program, which shall include the requirements outlined [in 29 C.F.R. § 1910.134 (c)]. The program shall cover each employee required [by 29 C.F.R. §1910.134] to use a respirator.”

Title 29 C.F.R. § 1910.134, subsection (d), *Selection of respirators*, “requires the employer to evaluate respiratory hazard(s) in the workplace, identify relevant workplace and user factors, and base respirator selection on these factors. Title 29 C.F.R. § 1900.134(d) also specifies appropriately protective respirators for use in [atmospheres immediately dangerous to life or health], and limits the selection and use of air-purifying respirators.”

Contrary to these requirements, B&W Y-12 failed to ensure that adequate PPE was used during the PWT. The Operator was performing a PWT for the maintenance activity on the Machine Dust Station, using procedure Y50-18-51-005, *Lithium Machine Dust Processing*, dated 11/20/2012. The Operator identified a leak during performance of the procedure, consulted with the System Engineer, and proceeded to clean a valve and ensure it was properly closed. While attempting to ensure the valve was closed, LiH discharged from the valve, resulting in significant injury to the Operator. At the time of the incident, the Operator was wearing safety shoes, safety glasses with side shields, leather work gloves, and company-issued clothing but lacked proper hand, face, and respiratory protection. The action taken to address the leaking valve necessitated increased personal protective measures, including impermeable gloves, full face respirator, and chemical protective clothing, in the absence of effective engineering controls, to abate the hazards presented by the leaking valve.

This noncompliance constitutes a Severity Level I violation.

Base Civil Penalty - \$75,000

Proposed Civil Penalty (as adjusted) - \$37,500

### 3. Control of Hazardous Energy

Title 29 C.F.R. § 1910.147, *The control of hazardous energy (lockout/tagout)*, covers “the servicing and maintenance of machines and equipment in which the *unexpected* energization or start up of the machines or equipment, or release of stored energy, could cause injury to employees.” [italics original].

Title 29 C.F.R. § 1910.147(d)(4), *Lockout or tagout device application*, subparagraph (i) states that “[l]ockout or tagout devices shall be affixed to each energy isolating device by authorized employees.”

Contrary to this requirement, B&W Y-12 failed to apply a lockout or tagout (LOTO) device to the nitrogen supply servicing the recycling system before the cleanout phase of the operation. This is inconsistent with requirements established under 29 C.F.R. § 1910.147 requirements and Job Hazard Analysis (JHA) 11418, *Clean Out Machine Dust Stations*, which specifies LOTO for station maintenance, i.e., disassembly of piping, tubing and braided hoses. B&W Y-12 determined that LOTO was unnecessary because “the Craft were only cleaning the Nitrogen lines which only had the potential for residual LiH in the lines and no excess LiH powder exposure existed.” However, the previous operation of this equipment was suspended in the middle of a run, thus, leaving more hazardous material in the system than expected from previous maintenance of the system. Therefore, the condition of the system during separation of the nitrogen lines presented a greater hazard to the personnel should there be an inadvertent release of nitrogen.

This noncompliance constitutes a Severity Level I violation.

Base Civil Penalty - \$75,000

Proposed Civil Penalty - \$75,000

## B. Firearm Discharge Event

### 1. Firearms Operations

Title 10 C.F.R. Part 851, Appendix A, Section 5, *Firearms Safety*, subsection (a), states that “[a] contractor engaged in DOE activities involving the use of firearms must establish firearms safety policies and procedures for security operations, and training to ensure proper accident prevention controls are in place. (1) [w]ritten procedures must address firearms safety, engineering and administrative controls, as well as personal protective equipment requirements.”

Contrary to these requirements, B&W Y-12 failed to establish and implement procedures to ensure proper accident prevention controls were in place and firearms operations were performed in accordance with safe operating procedures. At the time of the firearm discharge event, NNSA had directed B&W Y-12 to operate in accordance with Wackenhut Services, Inc. (WSI) policies and procedures pertaining to firearm safety. WSI Oak Ridge Standard Practice SP-232-011, *Y-12 Protective Force Firearms, Lasers, and Special Issue Equipment* (dated December 29, 2011), identifies the Y-12 protective force policies, minimum requirements and responsibilities, and daily procedures for Y-12 armorers and support staff when handling assigned firearms, ammunition, lasers, and special use equipment. SP-232-011 requires compliance with DOE Order 473.3, *Protection Program Operations*; DOE Manual 440.1-1A, *DOE Explosives Safety Manual*; 10 [C.F.R. Part] 851, and sections of 49 C.F.R. Parts 100 through 185, that pertain to protective force operations. Specific examples of applicable safety and health procedures that B&W Y-12 did not follow or were unclear are listed below:

- a. B&W Y-12 did not ensure that shift duty weapons were properly configured. Weapons were present in weapons racks in the “open bolt or full load” configuration: bolt locked to the rear, ammunition on the feed tray, top cover down, safety in the “fire” position, and tamper-indicating device (TID) seal affixed to charging handle. DOE Order 473.3, Attachment 2, Section J, *Firearms Operations*, subsection 1, *Basic Considerations*, subparagraph b.(5), states that “[w]hen firearms are transported in vehicles, watercraft, or aircraft and are not carried by an individual, they must be mounted in an appropriate rack or container with the firing chamber empty. During normal operations, long guns (e.g., rifles, shotguns, submachine guns) must not be carried with a round in the firing chamber. Long guns must never be placed in post or vehicle racks or carriers with a round in the firing chamber.” Therefore, the M240B and M249 machine guns are to be configured “bolt forward” on an empty chamber. Duty weapons stored, carried, or transported in the open bolt or full load configuration present a higher probability of an unintended discharge because the trigger is a single point of failure. If the trigger is depressed, the weapon’s action will cycle and discharge round(s) until the trigger is released.
- b. B&W Y-12 did not consistently ensure supervisors and SPO’s were adhering to prescribed procedures and that weapons were handled safely. SP 232-011 Section E, *Protective Force Firearms Operations*, subsection 5, *Handling the M240B and M249*

*Machine Guns*, subparagraph d.(1), states that “SPOs will verify the machine gun is off safe, bolt forward, and that the blue seal is in place upon issuance or when assuming post/patrol responsibility, and that linked ammunition is inserted in the feed tray.” Tasks associated with armorers exchanging post duty weapons include identifying weapons that are scheduled for maintenance, coordinating exchanges with security management, transporting weapons from the armory to the exchange locations, physically rotating new weapons into locked security racks within fixed or mobile posts, and affixing TID seals, or blue seals, to the charging handles. However, data collected during the course of this investigation concluded that established procedures for exchanging weapons in the field were not consistently followed. Other than validating weapon serial numbers on post equipment logs, on-shift protective force personnel were instructed not to handle the M240 or M249 machineguns, or otherwise participate in, the exchange process. This guidance is inconsistent with SP 232-011 Section E requirements, which require SPOs to verify the machine gun is off safe, bolt forward, and that the blue seal is in place upon issuance.

Collectively, these noncompliances constitute a Severity Level I violation.

Base Civil Penalty - \$75,000

Proposed Civil Penalty (as adjusted) - \$0

## 2. Firearms Handling

Title 10 C.F.R. Part 851, Appendix A, Section 5, *Firearms Safety*, subparagraph (a)(2), states that “...procedures must be established for... [h]andling misfires, duds, and unauthorized discharges.” Title 10 C.F.R. Part 851, Appendix A, Section 5, *Firearms Safety*, subsection (b), states that “[c]ontractors must ensure that personnel responsible for the direction and operation of the firearms safety program...have sufficient time and authority to implement the procedures under this section.”

Contrary to these requirements, B&W Y-12 failed to ensure that firearms were handled in a manner consistent with firearms handling procedures. Specific examples include the following:

- a. B&W Y-12 did not effectively implement safety procedures for handling firearms. SP 232-011, Section C, *Responsibilities*, subsection 7, *Security Police Officers*, states that “[i]t is extremely important that SPOs are trained by their supervisors to: a. Understand and comply with company policies and procedures related to firearms, lasers, and special issue equipment specified in this SP. b. Ensure firearms, ammunition, lasers, and special issue equipment are always handled in a safe and proper manner.” A protective force officer handling the M240B machine gun placed his finger on the trigger or allowed the trigger to be depressed, resulting in an unintended discharge. Regardless of the weapon configuration at the time of the unintended discharge, personnel handling weapons are required to consider all firearms as loaded and keep fingers clear of the trigger.

- b. B&W Y-12 did not ensure that the firearm was handled in accordance with safe practice following the unintentional discharge. SP 232-011, Section N, *Reporting and Investigating Incidents*, subsection 1. states that “SPOs, armorers, and the CTF staff will immediately report unauthorized discharges, operational failures of firearms and special issue equipment, injuries, and incidents, to include unusual occurrences and events (such as a significant equipment loss or malfunction, the unauthorized withdrawal of a firearm from its holster, dropping of a firearm, etc.) to their supervisor.” However, following the discharge of the 240B machine gun, protective force personnel removed, transported, and placed on the ground, without rendering safe, the weapon that had ostensibly malfunctioned, had ammunition inserted into or on the feed tray, with the top cover locked down and the safety in the fire position. The weapon remained on the ground in an unsafe configuration until supervisory personnel attempted to render it safe.
- c. B&W Y-12 did not ensure actions taken to disarm the 240B machine gun under field conditions were conducted in a safe and proper manner. Following the discharge event, a protective force sergeant, in the presence of protective force management and immediate supervisors, attempted to use an unauthorized and unsafe procedure to unload and render safe a M240B machine gun under field conditions. The officer attempted to clear a live round from the breach of the weapon by slowly moving the bolt forward in an attempt to capture and extract the round. This specific action replicates the locking and firing functions described in the cycle of operation and can result in the weapon discharging the round in the chamber.

Collectively, these noncompliances constitute a Severity Level I violation.

Base Civil Penalty - \$75,000

Proposed Civil Penalty (as adjusted) - \$0

### 3. Recordkeeping

Title 10 C.F.R. Part 851, Appendix A, Section 4, *Firearm Safety*, subparagraph (a)(2)(i), states that written procedures must address [s]torage, handling, cleaning, inventory, and maintenance of firearms and associated ammunition; ...”

Contrary to this requirement, B&W Y-12 failed to maintain Protective Force Security Key and Equipment Chain-of-Custody Log forms to document the status of the equipment inspection at shift change over. The chain-of-custody log for the day of the event was either not prepared or misplaced. SP 232-011, Section S, Definitions, subsection 8, *Custody Change*, states that “[a]t every custody change, the SPOs who are relieving each other are required to conduct a full inventory of equipment they exchange or receive, to include weapons, ammunition, security keys, and special issue equipment by signing the WSI Security Key and Equipment Chain-of-Custody Log forms.”

This noncompliance constitutes a Severity Level II violation.

Base Civil Penalty - \$37,500

Proposed Civil Penalty (as adjusted) - \$0

## II. REPLY

Pursuant to 10 C.F.R. § 851.42(b)(4), B&W Y-12 is hereby obligated, within 30 calendar days of receipt of this PNOV, to submit a written reply. The reply should be clearly marked as a "Reply to the Preliminary Notice of Violation."

If B&W Y-12 chooses not to contest the violations set forth in this PNOV and the proposed remedy, then the reply should clearly state that B&W Y-12 waives the right to contest any aspect of this PNOV and the proposed remedy. In such case, within 30 calendar days after receipt of this PNOV, B&W Y-12 must remit the total proposed civil penalty of \$150,000 by check, draft, or money order payable to the Treasurer of the United States (Account 891099) and mailed to the address provided below. If B&W Y-12 waives the right to contest any aspect of this PNOV, it will constitute a final order upon the filing of the reply.

If B&W Y-12 disagrees with any aspect of this PNOV or the proposed remedy, then as applicable and in accordance with 10 C.F.R. § 851.42(c)(1), the reply must: (1) state any facts, explanations, and arguments that support a denial of an alleged violation; (2) demonstrate any extenuating circumstances or other reason why the proposed remedy should not be imposed or should be further mitigated; and (3) discuss the relevant authorities that support the position asserted, including rulings, regulations, interpretations, and previous decisions issued by DOE. In addition, 10 C.F.R. § 851.42(c)(2) requires that the reply include copies of all relevant documents.

Please send the appropriate reply by overnight carrier to the following address:

Director, Office of Enforcement  
Attention: Office of the Docketing Clerk  
U.S. Department of Energy  
19901 Germantown Road  
Germantown, MD 20874-1290

A copy of the reply should also be sent to my office and the Manager of the NNSA Production Office.

Pursuant to 10 C.F.R. § 851.42(d), if B&W Y-12 fails to submit a written reply within 30 calendar days of receipt of this PNOV, B&W Y-12 relinquishes any right to appeal any matter in this PNOV, including the proposed remedy, and this PNOV will constitute a final order.



Frank G. Klotz  
Under Secretary for Nuclear Security  
Administrator, NNSA

Washington, DC

This 27 day of May 2015