



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW, SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

October 20, 2008

EA-08-204

Mr. R. P. Cochrane  
General Manager  
BWX Technologies, Inc.  
Nuclear Products Division  
P.O. Box 785  
Lynchburg, VA 24505-0785

**SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTY -  
\$32,500 (NRC INSPECTION REPORT NO. 70-27/2008-002)**

Dear Mr. Cochrane:

This letter refers to the inspection conducted from March 23 through June 21, 2008, at your facility in Lynchburg, VA. The purpose of the inspection was to determine whether activities authorized under the license were conducted safely and in accordance with NRC requirements. The inspection identified an apparent violation involving the failure to meet the performance requirements of 10 CFR 70.61(c)(4)(i) when, on April 28, 2008, a process operator received an exposure of liquid hydrogen fluoride (HF) to the eye, while trying to neutralize a liquid HF spill. The results of our review of this matter, including the identification of an apparent violation, were documented in NRC Inspection Report No. 70-27/2008-002, dated July 31, 2008.

In the letter transmitting the inspection report, we provided you an opportunity to address the apparent violation identified in the report by either attending a pre-decisional enforcement conference or by providing a written response before we made our final enforcement decision. In a letter dated August 29, 2008, you provided a response to the apparent violation. In summary, BWXT denied that a violation of 10 CFR 70.61(c)(4)(i) occurred, and concluded that the exposure to HF would not have led to irreversible or other serious, long lasting health effects because of the prompt response to the incident and the onsite medical care provided to the operator.

Based on the information developed during the inspection and the information provided in your response, the NRC has determined that a violation of NRC requirements occurred. The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in detail in the subject inspection report. In summary, the violation involved the failure to ensure that engineered and/or administrative controls were available and adequate to

prevent an acute chemical exposure from a hazardous chemical produced from licensed material as required by 10 CFR Part 70.61(c). As a result, a process operator received an ocular exposure of HF, while trying to neutralize a spill, that could have led to irreversible or other serious, long-lasting health effects.

The NRC concluded that BWXT did not identify engineering and/or administrative controls to prevent an acute chemical exposure from a hazardous chemical produced from licensed material, specifically an HF spill, that could have led to irreversible or other serious, long-lasting health effects to the process operator. BWXT's position, as discussed in Chapter 3 of the license application, is that "consequence mitigation may be applied to limit the potential accident consequence that is 'reasonable and credible' given the conditions under which the facility is allowed to operate." Chapter 3 of the license application describes two types of mitigation: programmatic and safety features. As examples of programmatic mitigators, BWXT included personal protective clothing, emergency response program, personnel training, spill procedure, warning properties of a chemical, and HF treatment. Regarding safety features, paragraph 3.2.4 of the license application states that the safety features type of mitigation "...includes engineered or administrative controls that limit the chemical or radiological impact of the accident (irreversible event) on the worker, public, or the environment as defined in 10 CFR 70." The referenced section of the license further states that "when the application of *safety features* mitigation results in rendering a consequence acceptable under the regulation, these mitigators are Items Relied On For Safety (IROFS)." The NRC concluded that BWXT did not have in place IROFS to reduce event likelihood or sufficient mitigators (programmatic or safety features) to limit event consequence.

In this case, the operator responded to the HF spill by using the incorrect neutralizing chemical agent, in part, because sufficient controls, e.g., proper labeling of the storage tank containing the correct chemical agent, were not in place. BWXT also failed to ensure that the process operator possessed sufficient knowledge, either via procedures and/or training, of how to respond to the HF spill with the correct quantity of neutralizing chemical agent, of how to use proper personnel protective equipment (PPE) including a face shield during his immediate response to the spill, or whether his immediate response to the HF spill should include making an emergency notification such that a more comprehensive response would be undertaken.

Although some of the items referenced above may be considered programmatic mitigators, the NRC concluded that these items, under different circumstances such as a delayed response by the emergency team, would not render the event unlikely or its consequences less than those described in Paragraph (c)(4)(i) of 10 CFR 70.61. As such, the NRC concluded that this event could have led to irreversible or other serious, long-lasting health effects.

As part of our review of this matter, the NRC obtained the services of a contract medical doctor to provide an independent assessment of the effects of the HF incident to the operator. Although the NRC contracted medical doctor reached a similar conclusion to BWXT's regarding the tangible value of the prompt response to the incident and the onsite medical care provided by co-workers and the BWXT emergency team in preventing vision loss as a result of this incident, the NRC considers the potential consequences of this incident to be significant. Under different circumstances, as discussed above, this event could have resulted in a more severe consequence to the operator. In addition, the lack of procedures and formal guidance for responding to a spill involving HF could have resulted in the operator adding a larger quantity of

the incorrect neutralizing agent, resulting in a more violent exothermic reaction with more severe consequences.

Based on the above and in accordance with the NRC Enforcement Policy, the NRC has concluded that a violation of 10 CFR 70.61(c)(4)(i) occurred, and that the significance of the violation should be characterized at Severity Level III.

In accordance with the Enforcement Policy, a base civil penalty in the amount of \$32,500 is considered for each Severity Level III violation. Because BWXT has been the subject of escalated enforcement within the past two years<sup>1</sup>, the NRC considered whether credit was warranted for *Identification* and *Corrective Action* in accordance with the civil penalty assessment process in Section VI.C.2 of the Enforcement Policy.

This issue was identified as a result of an event involving the spill of liquid HF. As such, credit is not warranted for the factor of *Identification*.

BWXT's immediate and long-term corrective actions in response to the incident were initially reviewed during the NRC's inspection and follow-up discussions, as well as in BWXT's written response of August 29, 2008. These actions included: (1) the initiation of a root cause investigation to determine causal factors and long-term corrective actions; (2) the proper sealing and labeling of drums containing chemical agents; (3) communication of the details of the incident with all uranium recovery personnel; (4) the development of a site-wide procedure for responding to chemical spills, including area-specific information (i.e. Uranium Recovery), and appropriate procedural training; (5) an inventory of chemicals in work areas, disposal of obsolete chemicals and the initiation of actions to ensure that secondary containers are properly labeled; (6) the establishment of detailed guidance regarding the use of a face shield, the establishment of spill response kits, and appropriate personnel training on use of these kits; (7) revision to Safety Analysis Reports and applicable license chapters to properly document the severity of consequences and to appropriately describe the application of programmatic mitigators (PPE, spill response procedures, etc.) present at the facility; and (8) the establishment of recurring training, on an annual basis, which addresses hazards associated with acids, use of spill kits, and proper PPE). Based on the above, credit is warranted for the factor of *Corrective Action*.

Therefore, to encourage prompt identification of violations, and in recognition of prompt and comprehensive corrective actions, I have been authorized, after consultation with the Director, Office of Enforcement, to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalty (Notice) in the base amount of \$32,500. Please be advised that issuance of this Notice constitutes escalated enforcement action that may subject you to increased inspection effort.

The immediate and long term corrective actions discussed above were derived from the NRC's initial inspection and follow-up discussions, and BWXT's written response of August 29, 2008.

---

<sup>1</sup> A Severity Level III violation was issued on January 24, 2008, involving a Raschig ring-filled vacuum cleaner (RRVC) that spilled a solution bearing special nuclear material (EA-07-240). A Severity Level III Problem consisting of three violations was issued on August 8, 2008, involving an RRVC that contained an inadequate level of Raschig rings (EA-08-171).

Although this information was sufficient to allow the NRC to make an informed civil penalty assessment decision regarding the factor of *Corrective Action*, this information is not sufficient to satisfy the requirements of 10 CFR 2.201 regarding a reply from the licensee containing the corrective steps that have been taken and the results achieved. As such, you are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," a copy of this letter and its enclosures will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agency-Wide Document Access and Management System (ADAMS) on the Internet at <http://www.nrc.gov/reading-rm/adams.html>. The NRC also includes significant enforcement actions on its Web site at [www.nrc.gov](http://www.nrc.gov); select What We Do, Enforcement, then Significant Enforcement Actions. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Sincerely,

*/RA/*

Luis A. Reyes  
Regional Administrator

Docket No. 70-27  
License No. SNM-42

Enclosures:

1. Notice of Violation and Proposed Imposition of Civil Penalty
2. NUREG/BR-0254

cc w/encls:

Barry L. Cole, Manager  
Licensing and Safety Analysis  
BWX Technologies, Inc.  
P.O. Box 785  
Lynchburg, VA 24505-0785

Leslie P. Foldesi, Director  
Bureau of Radiological Health  
Division of Health Hazards Control  
Department of health  
1500 East Main Street, Room 240  
Richmond, VA 23219

Distribution w/encls:

W. Borchardt, OEDO  
M. Weber, NMSS  
C. Marco, OGC  
C. Carpenter, OE  
E. Julian, SECY  
B. Keeling, OCA  
Enforcement Coordinators  
RI, RIII, RIV  
E. Hayden, OPA  
G. Caputo, OI  
H. Bell, OIG  
J. Wray, OE  
P. Habighorst, NMSS  
A. Snyder, NMSS  
M. Baker, NMSS  
L. Reyes, RII  
V. McCree, RII  
J. Shea, RII  
M. Layton, RII  
C. Evans, RII  
S. Sparks, RII  
C. Payne, RII  
A. Gooden, RII  
K. Clark, RII  
R. Hannah, RII  
R. Trojanowski, RII  
OEMAIL  
PUBLIC

PUBLICLY AVAILABLE       NON-PUBLICLY AVAILABLE       SENSITIVE       NON-SENSITIVE

ADAMS: X Yes      ACCESSION NUMBER: \_\_\_\_\_

OFFICE		RII:DFFI	RII:EICS	RII:ORA	OE	OGC	NMSS
SIGNATURE		JS 9/17/08	CFE 9/17/08	10/17/08	e-mail 10/1/08	Email 9/30/08	Email 9/27/08
NAME		JSHEA	CEVANS	MCCREE			
DATE							
E-MAIL COPY?	YES	YES	YES	YES	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY

DOCUMENT NAME:

NOTICE OF VIOLATION  
AND  
PROPOSED IMPOSITION OF CIVIL PENALTY

BWX Technologies, Inc.  
Lynchburg, VA

Docket No. 70-27  
License No. SNM-42  
EA-08-204

During an NRC Inspection conducted March 23 through June 21, 2008, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the NRC proposes to impose a civil penalty pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (Act), 42 U.S.C. 2282, and 10 CFR 2.205. The particular violation and associated civil penalty is set forth below:

10 CFR Part 70.61 (c) states, in part, that the risk of each credible intermediate-consequence event must be limited. Engineered controls, administrative controls, or both shall be applied to the extent needed so that, upon implementation of such controls, the event is unlikely or its consequences are less than those in paragraphs (c)(1)-(4) of this section.

10 CFR Part 70.61 (c)(4)(i) states, in part, that an intermediate consequence is an acute chemical exposure to an individual from licensed material or hazardous chemicals produced from licensed material that could lead to irreversible or other serious, long-lasting health effects to a worker.

Contrary to the above, on April 28, 2008, engineered and administrative controls were inadequate to limit an acute chemical exposure from a hazardous chemical produced from licensed material that could have led to irreversible or long lasting health effects to a worker. Specifically, engineered and administrative controls to limit leakage of liquid hydrogen fluoride (HF) and to provide for effective neutralization of spilled liquid HF were inadequate to ensure that an acute ocular exposure was unlikely. As a result, a Process Operator received an ocular exposure to liquid HF, while trying to neutralize a spill, that could have led to irreversible or other serious, long-lasting health effects.

This is a Severity Level III violation (EA-08-204, Supplement VI).  
Civil penalty - \$32,500.

Pursuant to the provisions of 10 CFR 2.201, BWX Technologies, Inc. (Licensee) is hereby required to submit a written statement or explanation to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, within 30 days of the date of this Notice of Violation and Proposed Imposition of Civil Penalty (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation; (EA-08-204)" and should include for each alleged violation: (1) admission or denial of the alleged violation; (2) the reasons for the violation if admitted, and if denied, the basis for denying the validity of the violation; (3) the corrective steps that have been taken and the results achieved; and (4) the date when full compliance will be achieved.

Your response may reference or include previously docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, the NRC may issue an order or a Demand for Information requiring you to explain why your license should not be modified, suspended, or

revoked or why the NRC should not take other action as may be proper. Consideration may be given to extending the response time for good cause shown.

Within the same time provided for the response required under 10 CFR 2.201, the Licensee may pay the civil penalty proposed above in accordance with NUREG/BR-0254 and by submitting to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, a statement indicating when and by what method payment was made, or may protest imposition of the civil penalty in whole or in part, by a written answer addressed to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission. Should the Licensee fail to answer within 30 days of the date of this Notice, the NRC will issue an order imposing the civil penalty. Should the Licensee elect to file an answer in accordance with 10 CFR 2.205 protesting the civil penalty, in whole or in part, such answer should be clearly marked as an "Answer to a Notice of Violation" and may: (1) deny the violation listed in this Notice, in whole or in part; (2) demonstrate extenuating circumstances; (3) show error in this Notice; or (4) show other reasons why the penalty should not be imposed. In addition to protesting the civil penalty in whole or in part, such answer may request remission or mitigation of the penalty.

In requesting mitigation of the proposed penalty, the response should address the factors addressed in Section VI.C.2, "Civil Penalty Assessment," of the Enforcement Policy. Any written answer addressing these factors pursuant to 10 CFR 2.205, should be set forth separately from the statement or explanation provided pursuant to 10 CFR 2.201, but may incorporate parts of the 10 CFR 2.201 reply by specific reference (e.g., citing page and paragraph numbers) to avoid repetition. The attention of the Licensee is directed to the other provisions of 10 CFR 2.205, regarding the procedure for imposing a civil penalty.

Upon failure to pay any civil penalty which subsequently has been determined in accordance with the applicable provisions of 10 CFR 2.205 to be due, this matter may be referred to the Attorney General, and the penalty, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282c.

The responses noted above, i.e., Reply to Notice of Violation, Statement as to payment of civil penalty, and Answer to a Notice of Violation, should be addressed to: Cynthia Carpenter, Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, One White Flint North, 11555 Rockville Pike, Rockville, MD 20852-2738, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region II, and to the resident inspector at the facility that is subject to this Notice.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), to the extent possible, it should not include any personal privacy, proprietary, classified or safeguards information so that it can be made available to the public without redaction. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material is withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential

NOV

3

commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 20<sup>th</sup> day of October, 2008

Enclosure 1