



Nuclear Operations Division

P.O. Box 785 • Lynchburg, VA 24505-0785 • Phone: 434.522.6000 • Web site: www.bwxt.com

November 14, 2008
08-137

Cynthia Carpenter, Director
Office of Enforcement
U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

- References:
- (1) License SNM-42, Docket 70-27
 - (2) Letter dated July 31, 2008, Shea (NRC) to Cochrane (BWXT), NRC Inspection Report No. 70-27/2008-002 and Notice of Violation
 - (3) Letter dated August 29, 2008, Cochrane (BWXT) to NRC (Document Control), Response to Apparent Violation in Inspection Report No. 70-27/2008-002; EA 08-204
 - (4) Letter dated October 20, 2008, Reyes (NRC) to Cochrane (BWXT), Notice of Violation and Proposed Imposition of Civil Penalty – \$32,500 (NRC Inspection Report No. 70-27/2008-002)

Subject: Reply to a Notice of Violation; (EA-08-204)

Dear Madam:

BWX Technologies, Inc. (BWXT) is providing a written response to the Notice of Violation (NOV) EA-08-204 that was transmitted by the NRC letter dated October 20, 2008 (Reference 4). BWXT denies that a Severity Level III violation occurred in this incident. BWXT will present evidence in the attached enclosure that a Severity Level III violation is not appropriate.

Should you have additional questions or require further information, please contact our Licensing Officer, Barry Cole at (434) 522-5665.

Sincerely,

Roger Cochrane
General Manager
BWXT, Nuclear Operations Division

Enclosure

cc: NRC, Region II, Regional Administrator
NRC, Merritt (Nick) Baker
NRC, Senior Resident Inspector

ENCLOSURE

RESPONSE TO NOTICE OF VIOLATION (NOV) AND PROPOSED CIVIL PENALTY EA-08-204**NOV EA-08-204**

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.

The Reason for Denying the NOV:

The basis of BWXT's denial of the violation stems from a review of the regulation and a review of the NRC's evaluation of the incident as addressed in the Notice of Violation letter (Reference 4). There are two paths for meeting the intent of the regulation. Licensees may implement engineered controls, administrative controls or both such that the event is unlikely or licensees may make the consequences of the event less than those in paragraphs (c) (1) – (4). The violation as cited is that engineered and administrative controls were inadequate to make the acute ocular exposure unlikely **and** as a result, an operator received an ocular exposure that could have led to irreversible or other serious, long-lasting health effects. Please note the regulation does not have an "and" statement. BWXT asserts that in this incident the intent of the regulation was met by lessening the severity of the consequences through utilization of programmatic mitigators as outlined in BWXT Integrated Safety Analysis (ISA) documentation.

BWXT in good faith has documented the ISA to address both paths of the regulation. In this case, the accident scenario which could lead to an event consequence of personnel exposure to HF deals with leaks in the piping system. The prevention is documented as utilizing compatible materials with HF and the protection in place is double containment lines with leak detection systems, which are an industry standard practice for liquid HF, rendered the likelihood of the event acceptable under the regulation. The programmatic mitigators for the accident consequence are also documented in the scenario dealing with leaks. These are personal

protective clothing, emergency response program, personnel training, spill procedure, warning property of chemical (i.e., smell) and HF treatment protocol stored in the Recovery change room.

One of the NRC points from their evaluation of the Apparent Violation that we would like to clarify is a reference to Chapter 3 of BWXT's License application in regards to IROFS and mitigators. The NRC letter (Reference 4) refers to a description of "safety feature mitigation". Specifically the statement "When the application of safety feature mitigation results in rendering a consequence acceptable under the regulation, these mitigators are IROFS" is not applicable to this event. BWXT attempted to be very clear in the license that mitigators such as safety glasses, face shields, eyewash stations, spill response procedures and medical response were defined as "programmatic mitigators" and not "safety features" since they are required to meet Occupational Safety and Health Administration (OSHA) regulations as specified in the NRC Memorandum of Understanding (Reference: 53 FR 43950 October 31, 1988). Therefore, the following statement is made about programmatic mitigators in Chapter 3 of BWXT's License application: programmatic mitigators are "not translated into IROFS since they are already captured in regulatory space as general commitments". BWXT would like to be clear that we did not intend for the programmatic mitigators as documented in the ISA for this accident consequence of personnel exposure to HF to be IROFS. The sole purpose is to provide for mitigation; as stated in Chapter 3 "mitigation does not affect the likelihood of the accident but only serves to limit the consequences of the accident after it has occurred."

The second point from the NRC's evaluation as expressed in the NRC letter (Reference 4) deals with the assessment of the violation based on Section IV.A of the NRC Enforcement policy. The policy states that the NRC considers four specific issues when assessing the significance level of a violation: (1) actual safety consequences; (2) potential safety significance, including the consideration of risk information; (3) potential for impacting the NRC's ability to perform its regulatory function; (4) any willful aspects of the violation. In regards to this incident BWXT can agree with the NRC's assessment that issues 3 and 4 are not relevant. We also agree with the issue 1 assessment of the actual safety consequences. Based on the statement in the NRC letter (Reference 4) that "NRC's contract medical doctor reached a similar conclusion to BWXT" we would concur with the NRC that the actual safety consequences in this incident were not significant due to the prompt medical response and care received by the operator.

However, BWXT does not agree with the NRC's point that the potential consequences of this incident were significant. The NRC letter (Reference 4) expresses several conclusions which led the NRC to this assessment of potential safety consequence. One of these is the following statement: "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." BWXT disagrees with this conclusion for several reasons which are related to the defense-in-depth approach employed in the ISA.

Defense-in-depth as it relates to this instance would be depth of the mitigators to render the severity of the consequences less than those prescribed in the regulation. Under the defense-in-depth philosophy the safety of an operation is ensured by the unlikely scenario that all the mitigation factors will fail simultaneously. Thus the failure of one or more mitigators will not lead to a significant event. The NRC has identified a delayed response by the emergency team as a contributing factor in assessing significance. BWXT's Emergency Plan states that mutual aid agreements with Concord Volunteer Fire Department and Concord Rescue squad exist should the emergency team not have a full staff available on site to report. For this particular incident should the onsite emergency team have been delayed then the operator would have stayed in the eyewash station until medical assistance had arrived whether the onsite emergency team or Concord personnel. This approach is in agreement with the Material Safety Data Sheet (MSDS) for HF which states the correct method to employ when exposure occurs to the eyes: "flush eyes with running water and administer calcium gluconate 1% solution but if calcium gluconate is not available continue flushing with water."

Another circumstance that NRC cited in the NRC letter (Reference 4) which seems to have influenced the assessment of potential safety significance was as follows: "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." The neutralizing agent applied to the spill was sodium hydroxide (NaOH) which reacts with HF to form $\text{NaF} + \text{H}_2\text{O} + \text{heat}$. The heat created the reaction; therefore, the splatter from the reaction was a mixture of the caustic NaOH and HF. The operator's training on neutralizing spills was a factor since they are trained to use enough neutralizing agent to cover the spill which created a crust effect over the reaction. There had been no previous experience with violent reactions utilizing the soda ash so the operator simply did not appropriately assess the risk because he truly believed he had the correct neutralizing material. The supposition that had the operator used two cups of material instead of one would have created a more severe a reaction and more severe consequences is unfounded based on the knowledge of chemistry of the reaction. The supposition does not take into account the quantity and concentration of HF, the surface area of the spill, and how the NaOH is applied to the HF.

BWXT does not believe the potential consequences of this incident were significant due to the defense-in-depth mitigators in place at the facility. As stated earlier the defense-in-depth approach is utilized throughout BWXT's ISA whether it is for a criticality, a radiation dose event, a fire, or a chemical safety consequence event. In utilizing this approach we are confident that BWXT's safety basis is adequate to address the intent of the regulation whether by limiting the likelihood of an event or limiting the severity of the consequences should an event take place. Based on the Enforcement policy guidance if the potential safety consequences of the event are judged to be low, which is BWXT's contention, then the violation does not warrant a Severity Level III.

In conclusion, BWXT's position is that the event is not a violation of 10 CFR 70.61 requirements because the programmatic mitigators make the consequences of the event less than those in

paragraphs (c) (1) – (4), and the event does not warrant a Severity Level III violation because the potential consequences of this incident were not significant due to the defense-in-depth programs in place at the facility.