



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

December 22, 2010

Mr. James H. Lash  
President and Chief Nuclear Officer  
FirstEnergy Nuclear Operating Company  
Mail Stop A-GO-19  
76 South Main Street  
Akron, OH 44308

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2; DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1; AND PERRY NUCLEAR POWER PLANT, UNIT NO. 1 – REQUEST FOR THE USE OF DELTA PROTECTION MURUROA BLU SINGLE-USE RESPIRATORY PROTECTION SUITS (TAC NOS. ME4590, ME4591, ME4592 AND ME4593)

Dear Mr. Lash:

By letter dated August 2, 2010 (Agencywide Documents Access and Management System Accession No. ML102350162), FirstEnergy Nuclear Operating Company (FENOC) requested U.S. Nuclear Regulatory Commission (NRC) authorization, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 20.1703, "Use of Individual Respiratory Protection Equipment," and 10 CFR 20.1705, "Application for Use of Higher Assigned Protection Factors," to use the Delta Protection Mururoa BLU single-use respiratory protection suits (Mururoa BLU suit) described in "Topical Report of Delta Protection Mururoa BLU Suit System" (TR MURUBLU05NP). Upon NRC authorization, the use of the Mururoa BLU suit will be included as an option in the FENOC respiratory protection system.

The NRC staff concludes in the enclosed safety evaluation, that the FENOC request is acceptable, and within the provisions of 10 CFR Part 20. Therefore, you are authorized to use the Mururoa BLU suits, with an assigned protection factor of 2,000, and whenever this equipment is used you do not need to provide standby rescue persons at Beaver Valley Power Station, Unit Nos. 1 and 2, Davis-Besse Nuclear Power Station, Unit No. 1 and Perry Nuclear Power Plant, Unit No. 1.

J. Lash

- 2 -

If you or your staff have any questions concerning the resolution of this matter, please contact Michael Mahoney at 301-415-3867.

Sincerely,

***/RA by E. Brown for/***

Robert Carlson, Chief  
Plant Licensing Branch LPL3-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-334, 50-412, 50-346, 50-440

Enclosure:  
Safety Evaluation

cc w/encl: Distribution via Listserv



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

USE OF DELTA PROTECTION MURUROA BLU, SELF-SUPPLIED, SINGLE-USE

RESPIRATORY PROTECTION SUITS

FIRSTENERGY NUCLEAR OPERATING COMPANY

BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2;

DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1;

AND PERRY NUCLEAR POWER PLANT, UNIT NO. 1

DOCKET NOS. 50-334, 50-412, 50-346, AND 50-440

1.0 INTRODUCTION

By letter dated August 2, 2010 (Agencywide Documents Access and Management System Accession No. ML102350162), FirstEnergy Nuclear Operating Company (FENOC, the licensee), requested U.S. Nuclear Regulatory Commission (NRC) authorization to use the French-designed Delta Protection Mururoa BLU, self-supplied, single-use respiratory protection suits (Mururoa BLU suits) at Beaver Valley Power Station, Unit Nos. 1 and 2, Davis-Besse Nuclear Power Station, Unit No. 1, and Perry Nuclear Power Plant, Unit No. 1.

To date, these Mururoa BLU suits have not been tested or certified by the National Institute for Occupational Safety and Health (NIOSH).

Pursuant to Title 10 of the *Code of Federal Regulations* (CFR), Part 20.1703(b) the licensee must apply to the NRC for authorization to use the equipment.

2.0 REGULATORY EVALUATION

Part 20 to 10 CFR, "Standards for Protection Against Radiation," Subpart H, "Respiratory Protection and Controls to Restrict Internal Exposure in Restricted Areas," provides for the use of respiratory protection equipment (respirators) for protection against airborne radioactive materials. Subpart H establishes the requirements for implementing a respiratory protection program.

Section 20.1703 to 10 CFR, "Use of individual respiratory protection equipment," paragraph (a), requires that respiratory protection equipment used by a licensee to limit the intake of radioactive material be tested and certified by NIOSH. However, 10 CFR 20.1703(b) states that a licensee can submit an application to the NRC for authorization to use respiratory protection equipment that has not been tested and certified by NIOSH. The licensee must demonstrate

that the material and performance characteristics of the equipment are capable of providing the proposed degree of protection under anticipated conditions of use through licensee testing or other reliable test information.

Section 20.1703(f) to 10 CFR requires that standby rescue persons be present whenever one-piece atmosphere supplying suits or any respiratory protection device from which an unaided individual would have difficulty in extricating himself or herself are being used.

Section 20.1705 to 10 CFR, "Application for use of higher assigned protection factors," states that a licensee shall obtain NRC authorization before using assigned protection factors in excess of those specified in Appendix A to 10 CFR Part 20. Since Appendix A does not provide an assigned protection factor (APF) for air-purifying respiratory protection suits, the licensee must obtain NRC approval to take credit for an APF for this model of the respiratory protection equipment.

In 2006, the NRC issued a safety evaluation (SE) dated April 10, 2006, (ADAMS Accession No. ML102350162), which approved Topical Report (TR) MURUBLU05NP, "Topical Report for Delta Protection Mururoa BLU Suit Systems," dated October 27, 2005 (ADAMS Accession No. ML060950499) produced by the manufacturer of the Mururoa BLU suits. That SE and TR are discussed in more detail in Section 3.0, Technical Evaluation below.

### 3.0 TECHNICAL EVALUATION

FENOC requested permission to use the French-designed Mururoa BLU suits due to benefits in contamination control, heat stress reduction, and respiratory protection. These suits use a battery powered air purifying respirator, which purifies ambient air through four high efficiency particulate air filters. There are two variations of this suit depending on the material of construction: one designated as polyvinyl chloride (PVC) and one designated as Ethyfuge (vinyl acetate). The suit eliminates the need for a breathable air distribution system, which improves freedom of movement and worker efficiency, thus contributing to maintaining worker doses as low as reasonably achievable (ALARA).

The NRC has provided general guidance for use of respiratory protection suits in NRC Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection," dated October 1999 (ADAMS Accession No. ML003739528):

One-piece and two-piece supplied-air suits are permitted for use in nuclear industry respiratory protection programs, but no APF is assigned and no protection credit may be taken except [when the licensee files a written application with the NRC as outlined in 10 CFR 20.1705]. NIOSH certification procedures do not currently include a method for testing and certifying these suits. NRC believes, however, that in certain nuclear industry applications (e.g., control rod drive removal at boiling water reactors) they might be the best overall choice, taking into account respiratory protection, contamination control considerations, heat stress, and ALARA.

In addition to the general guidance listed above, the NRC has issued additional information specific to the French-designed Mururoa BLU suits. In October 2005, the manufacturer of the suits, Bacou-Dalloz, submitted a general description of the suits in TR MURUBLU05NP

to the NRC staff. The NRC conducted a review of this TR and approved the use of the respiratory protection equipment under the conditions specified in the TR. The NRC's SE concluded that the TR is acceptable for referencing in licensing applications requesting use of the suits as specified in TR MURUBLU05NP under the limitations delineated in the TR. The SE approving TR MURUBLU05NP is used as a precedent and a basis for the NRC staff's response to FENOC request to use these suits. The SE analyzed the testing data supplied by the manufacturer and found that these suits will provide the wearer with an adequate level of protection.

Section 4.0 of TR MURUBLU05NP, "Approved Device Configuration and Conditions of Use," describes the suit configuration and conditions under which these suits may be used by NRC-regulated licensees. The configuration and conditions of use are based on the suit's design as specified in the SE. Since the suit supplies filtered ambient air to the wearer, the suits are only effective against particulate airborne contamination. In addition, the suits are designed to be used only in atmospheres containing specific contaminants in concentrations that are not immediately dangerous to life or health (IDLH) and have an oxygen content of at least 19.5 percent by volume.

FENOC committed to use the suits within the device configuration and conditions for use identified in Section 4.0 of TR MURUBLU05NP. Additionally, FENOC agreed to use the suits consistent with Section 6.4 of the SE. The NRC staff verified that the licensee's commitments in the FENOC amendment request meet the requirements in the NRC SE, Section 4.0.

The NRC staff has reviewed the regulatory commitments in FENOC's amendment request, and concludes these commitments meet the requirements of 10 CFR 20.1703. As a result, the NRC staff finds it acceptable for the suits to be used with an assigned protection factor of 2,000 as provided in TR MURUBLU05NP.

Consistent with the SE, and as outlined in the TR, and prior to placing a Mururoa BLU suit in service at Beaver Valley Power Station, Unit Nos. 1 and 2, Davis-Besse Nuclear Power Station, Unit No. 1, or Perry Nuclear Power Plant, Unit No. 1, FENOC has made the following regulatory commitments in their authorization request dated August 2, 2010:

1. The Mururoa BLU suits will be used in a configuration consisting of: a Mururoa BLU one-piece encapsulating suit of either PVC or Ethyfuge construction, fitted with a Micronel C500X-012EKAB60 blower with a C501A-012Ak-A battery [consistent with the parts list in Section 7 of Attachment 6.6.6 to Topical Report MURUBLU05NP (ADAMS Accession No. ML053060280)], and four Scott FP 10 P3, or four Delta Protection P3, high-efficiency particulate filter cartridges. All four filter cartridges must be matching and replaced as a set.
2. Procedures for use of the Mururoa BLU suits will be integrated into the respiratory programs required by Subpart H of 10 CFR Part 20. Fit testing of user is not applicable to fully encapsulating suits. Wearers will be trained on these conditions of use, as well as the emergency escape features of the suit enclosure.
3. Procedures will require the Mururoa BLU suits to be used in accordance with recommendations in Attachments 6.6.4, 6.6.5, and 6.6.6 of TR MURUBLU05NP.

4. Procedures will require the Mururoa BLU suit enclosures to be single use only, and be discarded after use. Unused suit enclosures will be stored in their original manufacturer's packing in an environment not colder than 32 degrees Fahrenheit (°F), nor hotter than 140 °F, with a maximum storage shelf-life of 3 years. Suits are not to come in contact with anything colder than 41 °F, or hotter than 140°F, during use.
5. Procedures will require the Mururoa BLU suits to be donned with a fully charged battery pack installed on the blower. The maximum period of use (timed from a fully charged battery) is 4 hours with the blower set at 600 liters/minute, and 7 hours with the blower set at 400 liters/minute.
6. Procedures will require the Mururoa BLU suits to be used only in atmospheres containing specific contaminants in concentrations that are not IDLH, as given in NIOSH "Concept for Industrial Power, Air-purifying Respiratory Standard," Draft for Comment, May 30, 2005, and have an oxygen content of at least 19.5 percent by volume.
7. Communication channels will be established between FENOC and Delta Protection to report any defects, if experienced, with the Mururoa BLU suit, and to ensure that any manufacturer's notifications concerning the suit systems are received in a timely manner.
8. The Mururoa BLU suits will be integrated into the respiratory protection programs, using the information provided by the manufacturer.
9. Lesson plans will be developed to train workers on the Mururoa BLU suit features, donning, use and removal, cautions, and use of mouth strips and tear off strips for routine and emergency egress.
10. Health Physics personnel will be provided additional training for selection, approval, issue, equipment set-up, operation and maintenance of the Mururoa BLU suits.

The NRC staff has compared these commitments to the conditions and limitations in the TR MURUBLU05NP and the associated SE, and finds these commitments acceptable to allow FENOC to use the Mururoa BLU suits. Additionally, NRC SE dated April 10, 2006, concluded that the design features of the suit, coupled with the required training on escape methods that are given to all suit users are adequate for staff to conclude that "...the requirements for standby rescue persons in Section 20.1703(f) is not applicable.

Subpart H of 10 CFR Part 20 establishes the requirements for implementing a respiratory protection program. These programmatic requirements ensure that worker doses from airborne radioactive materials are maintained ALARA. The licensee intends to integrate the use of the Mururoa BLU suits into its existing, ongoing respiratory protection program that satisfies Part 20 requirements. The NRC staff finds this approach acceptable.

In addition to the above commitments, FENOC has an NRC approved radiation protection program with established respiratory protection procedures. The addition of the Mururoa BLU suits to the established program enhances worker protection and is consistent with the ALARA program. The NRC staff finds that use of the suit in accordance with the commitments in the

authorization request and the established respiratory program complies with regulatory requirements, and is therefore acceptable.

#### 4.0 CONCLUSION

Based on the testing data evaluated by the NRC in TR MURUBLU05NP, when used in accordance with the applicable manufacturer's instructions, licensee commitments, and requirements of Subpart H of 10 CFR Part 20; the NRC staff concludes that the licensee's request to use the Mururoa BLU suits and take credit for APF of 2000 and not require standby rescue people, is acceptable.

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Date: December 22, 2010

J. Lash

- 2 -

If you or your staff have any questions concerning the resolution of this matter, please contact Michael Mahoney at 301-415-3867.

Sincerely,

***/RA by E. Brown for/***

Robert Carlson, Chief  
Plant Licensing Branch LPL3-2  
Division of Operating Reactor Licensing  
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