



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

June 30, 2009

Mr. Mark J. Ajluni
Manager, Nuclear Licensing
Vogtle Electric Generating Plant
40 Inverness Center Parkway
Birmingham, Alabama 35201

SUBJECT: REQUEST TO USE AN ASSIGNED PROTECTION FACTOR WITH
FRENCH-DESIGNED AIR-LINE RESPIRATOR EQUIPMENT (TAC NOS.
ME0925, ME0926, ME0927, ME0928, ME0929 AND ME0930)

Dear Mr. Ajluni:

By letter dated March 23, 2009, the Southern Nuclear Operating Company, Inc. (SNC) requested U.S. Nuclear Regulatory Commission (NRC) authorization, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 20, to use an assigned protection factor (APF) greater than that listed in Appendix A to Part 20, for persons working in areas of airborne radioactivity with certain respiratory protection equipment that has not been certified by the National Institute for Occupational Safety and Health. Specifically, SNC requested authorization to use an APF value of 5000 with equipment designed by the French firm, Delta Protection, to include protection suit models Mururoa V4 F1 and the model MTH2 suit. Approval was requested for the use of this equipment at the Joseph M. Farley Nuclear Plant, Units 1 and 2, Edwin I. Hatch Nuclear Plant, Units 1 and 2, and the Vogtle Electric Generating Plant, Units 1 and 2.

The NRC staff concludes in the enclosed safety evaluation that the SNC request is acceptable, and is consistent with the provisions of 10 CFR Part 20. Therefore, SNC is authorized to use the Delta Protection air-supplied suits, models MURUROA V4 F1 and MTH2, with an assigned protection factor of 5000.

Sincerely,

A handwritten signature in black ink that reads "Melanie C. Wong".

Melanie C. Wong, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-348, 50-364, 50-321,
50-366, 50-424, 50-425

Enclosure:
Safety Evaluation

cc w/enclosure: Distribution vial Listserv



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO USE OF RESPIRATORY PROTECTION EQUIPMENT

WITH A PROTECTION FACTOR OF 5000

SOUTHERN NUCLEAR OPERATING COMPANY

JOSHEP M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2

EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2

VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2

1.0 INTRODUCTION

By letter dated March 23, 2009, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML090830350), the Southern Nuclear Operating Company, Inc. (SNC, the licensee) requested U.S. Nuclear Regulatory Commission (NRC) authorization to use an assigned protection factor (APF) greater than that listed in Appendix A to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 20, for persons working in areas of airborne radioactivity with certain respiratory protection equipment that has not been certified by the National Institute for Occupational Safety and Health (NIOSH). Specifically, the licensee requested authorization to use an APF value of 5000 with equipment designed by the French firm, Delta Protection, to include protection suit models Mururoa V4 F1 and the model MTH2 suit (hereafter referred to as the Delta Suits). Approval for the use of this equipment at the Joseph M. Farley Nuclear Plant, Units 1 and 2, Edwin I. Hatch Nuclear Plant, Units 1 and 2, and the Vogtle Electric Generating Plant, Units 1 and 2, was requested.

2.0 REGULATORY EVALUATION

10 CFR Part 20, "Standards for Protection Against Radiation," Subpart H, "Respiratory Protection and Controls to Restrict Internal Exposure in Restricted Areas," concerns the use of respiratory protection equipment for protection against airborne radioactive materials.

10 CFR Section 20.1703, "Use of individual respiratory protection equipment," paragraph (a), requires that "The licensee shall use only respiratory protection equipment that is tested and certified by the National Institute of Occupational Safety and Health (NIOSH) except as otherwise noted in this part." Paragraph (b) states that: "If the licensee wishes to use equipment that has not been tested or certified by NIOSH, or for which there is no schedule for testing or certification, the licensee shall submit an application to the NRC for authorized use of this equipment, except as provided in this part." Paragraph (f) requires standby rescue personnel be provided when using an atmosphere supplying suit from which an unaided wearer would have difficulty extracting himself or herself.

Enclosure

Appendix A to 10 CFR Part 20, "Assigned Protection Factors for Respirators," does not provide an APF for atmosphere supplying respirator (air-line respirator) suits in a continuous-flow operating mode. Instead, it references footnote (g) that states, "No NIOSH approval schedule is currently available for atmosphere supplying suits. This equipment may be used in an acceptable respiratory protection program as long as all the other minimum program requirements, with the exception of fit testing, are met [i.e., § 20.1703]."

Section 20.1705, "Application for use of higher assigned protection factors," states that a licensee shall obtain NRC authorization before using APFs in excess of those specified in Appendix A to 10 CFR Part 20. Since Appendix A does not provide an APF for atmosphere supplying respirator (air-line respirator) suits in a continuous-flow operating mode, the licensee must obtain NRC approval to take credit for an APF for the Delta Suits.

The Delta Suits are atmosphere supplying suits that fully enclose the wearer. Breathing and cooling air is supplied from the plant's air system through an air hose and a regulator that is integral to the suit. Currently, NIOSH does not certify suit type respiratory protective devices. Footnote (g) in Appendix A to 10 CFR Part 20, authorizes the use of non-NIOSH certified supplied air suits when used in a respiratory protection program that meets the requirements of Section 20.1703(c), with the exception of fit testing. Therefore, requesting authorization under Section 20.1703(b) is not required. However, since no APF is provided in 10 CFR Part 20, Appendix A, for air supplied suits, authorization to use an APF of 5000 is required pursuant to 10 CFR Section 20.1705.

3.0 TECHNICAL EVALUATION

Criteria and background information used for the NRC staff's technical evaluation include 10 CFR Part 20, Subpart H; 10 CFR Part 19, paragraph 19.12, "Instruction to Workers"; Regulatory Guide 8.15, Revision 1, "Acceptable Programs for Respiratory Protection"; NUREG/CR-0041, Revision 1, "Manual of Respiratory Protection Against Airborne Radioactive Materials"; 42 CFR Part 84, which addresses NIOSH testing and certification regulations; Los Alamos National Laboratory Report LA-101560MS, "Acceptance Testing Procedures for Air-Line Supplied Air Suits"; and American National Standards Institute standard ANSI Z88.2-1992, "American National Standard Practices for Regulatory Protection."

NRC guidance provided in NUREG/CR-0041 encourages the use of supplied-air suits, noting that in certain work environments, supplied-air suits may be the best respiratory device when considering respiratory protection, heat stress, trying to minimize skin contamination, and trying to maintain worker doses as low as is reasonably achievable (ALARA).

Testing conducted by the Institute for Nuclear Protection and Security, the European certifying agency, and widespread use in European power plants of similar certified suits form the basis for the licensee's request. The licensee has requested authorization to use, and to take credit for, the protection provided by two suits during normal (non-emergency) operations. The suits are made by Delta Protection, France and are identified as Mururoa V4 F1 (Certificate No. 0073/197/162/12/97/0028) and MTH2 (Certificate No. 0073/197/162/01/96/0001). Both models have been approved as a single-use suits (i.e., disposed of after one use), and the licensee proposes to use the suits in the approved configurations, relative to the suits' form, fit, and function.

The European Standard EN 1073-1 (January 1998), "Protective Clothing Against Radioactive Contamination," Part 1: Requirements and Test Methods for Ventilated Protective Clothing Against Particulate Radioactive Contamination, provided testing and acceptance criteria used for certification of the suits. This standard is generally consistent with the pertinent acceptance criteria provided in Los Alamos National Laboratory Report LA-10156-MS, which is used to test and authorize the use of air-supplied suits at U.S. Department of Energy sites.

The certification-testing regime was broadly based and encompassed a range of various functional areas, including suit material strength, tear and puncture resistance, material flammability, wearer comfort, noise level, wearer visibility, air flow, carbon dioxide concentrations, and degree of contaminate in-leakage during a series of varied simulated work practices and exercises. Both models passed all required tests, and both provided a measured average protection level (fit factor) of 50,000. A fit factor, which was developed in a simulated work environment, is the ratio of contaminate concentration outside the suit to the contaminate concentration inside the suit. Given an overall measured fit factor of 50,000 (averaged over all exercise activities), allowing an APF of 5000 provides a conservative safety factor for estimating the actual protection provided to the user by the suit in the actual working environment. APFs are generally lower than fit factors for all types of respirators, since workplace demands are typically greater on the user of the respirator than are laboratory conditions and simulated work activities due to such workplace factors as higher heat and humidity conditions, longer work durations, and greater worker fatigue.

In general, when compared with other air-fed respirators, both Delta Suit models provide the following advantages to the user: (1) dual zippers (metal zipper inside and plastic zipper outside); (2) a welded sleeve-to-insert communication cable; (3) a removable strip near the mouth that could be used for emergency breathing in case of loss of supplied air; (4) an egress strip stretching from the left arm, over the head, and to the right arm that is used for undressing and for self-rescue in an emergency, such as loss of supplied air; (5) an air intake located at the waist with a built-in regulator that can adjust, but not block, air flow; (6) dual magnetic valves that provide ventilation and relief of excess pressure in case the suit is squeezed or pinched unexpectedly; (7) a very low noise level at maximum air flow; and (8) air flow to the hands, feet, face, and chest.

The removable emergency breathing strip, and the over-the-head egress strip, provided on both models of the Delta Suits, allows an unaided wearer to escape from the suit in case of loss of breathing air supply or other emergency. A worker can easily extricate himself or herself from the suit by pulling off the mouth strip and then opening the hood, or by pulling the egress strip from the forearm to the head. Therefore, when used in a manner that does not impede the use of these safety features, the requirement for providing a standby rescue person in 20.1703(f) is not applicable to the Delta Suits.

Other features of the Delta Suits include light-weight (2.65 pounds), a one-piece construction with welded gloves and booties with tie straps. The helmet is made with PVC material that provides distortion-free vision and is large enough for wearing a headset. Noise levels are less than 80 decibels at maximum air flow, and air flow can be adjusted by the user for comfort, but cannot be shut off below the required minimum air flow. The Delta Suits provide a manifold system welded to the suit that distributes air to the helmet, the legs and the arms. Both models are heat resistant to 60° C and can be used in temperatures up to 55° C. The suits are constructed with reinforced elbow, knee, and crotch areas.

The licensee intends to use the suits to minimize personnel exposure/contamination in radiation areas with high contamination or potential for high airborne radioactivity. Examples of these include the steam generator primary manways, underneath the reactor head, and in the reactor cavity. The Delta Suits offer a safer and more efficient means to protect workers in areas of high radiological contamination and in areas where there is a potential for airborne contamination. The Delta Suits are preferable to the currently used bubblehoods because the ease of removal features provide a means to undress that minimizes the potential for personnel contamination events. In addition, eliminating the need for using standby rescue personnel helps to minimize occupational radiation exposures.

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 Delta Suits into their existing, ongoing respiratory protection program that satisfies 10 CFR Part 20 requirements, using the manufacturer's recommendations described in the "Mururoa V4 Fully Enclosed Suit – General Description" (No. Do/USA/1), the "Instructions for Donning and Removal of the Mururoa V4 Fully Enclosed Suit" (No. Do/USA/2), and the "M.T.H.2 and Mururoa V4F1 Instructions For Use" (NO/841442T). The NRC staff finds this approach acceptable.

4.0 REGULATORY COMMITMENTS

The licensee has made the following regulatory commitments concerning the use of these suits.

1. The manufacturer's instructions for use and storage of the Delta Protection Mururoa V4F1 and V4 MTH2 suits will be integrated into [the] SNC respiratory program.
2. Lesson plans will be developed and used to train workers and radiation protection technicians on the Delta Protection Mururoa V4F1 and V4 MTH2 suits features, donning, use and removal, and use of mouth strip and tear off strips for routine and emergency egress.
3. SNC radiation protection personnel will be provided additional training for selection, approval, issue, equipment set-up, operation and maintenance instructions for the Delta Protection Mururoa V4F1 and V4 MTH2 suits.
4. The Delta Protection Mururoa V4F1 and V4 MTH2 suits will be discarded after a single use and will not be used in atmospheres that are immediately dangerous to life and health (IDLH).
5. Any defects discovered will be entered into the SNC Corrective Action Program and reported to the manufacturer, as necessary. Industry notifications, when required, will be made through the Operating Experience Program

5.0 CONCLUSIONS

On the basis of the testing data provided, and 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, and take credit for an APF of 5000, with both the Mururoa V4F1 and MTH2 supplied air suits, is acceptable. The NRC staff also concludes that an unaided individual would not have difficulty removing the suit, thus the standby rescue personnel, discussed in 10 CFR 20.1703(f), are not required.

Principal Contributors: R. Pedersen, NRR
R. Martin, NRR

Date: June 30, 2009

Mr. Mark J. Ajluni
 Manager, Nuclear Licensing
 Vogtle Electric Generating Plant
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 Birmingham, Alabama 35201

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Sincerely,

/RA/

Melanie C. Wong, Chief
 Plant Licensing Branch II-1
 Division of Operating Reactor Licensing
 Office of Nuclear Reactor Regulation

Docket No. 50-348, 50-364, 50-321,
 50-366, 50-424, 50-425

Enclosure:
 Safety Evaluation

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* via memo NRR-106

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NAME	RMartin	SRohrer	RPedersen	DRoth	MWong
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