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Acting Director  
Nuclear Safety & Licensing

CNRO-2006-00034

July 13, 2006

U. S. Nuclear Regulatory Commission  
Attn.: Document Control Desk  
Washington, DC 20555-0001

SUBJECT: Supplement to Request for Use of Delta Protection Mururoa V4F1 R Supplied Air Suits

Arkansas Nuclear One  
Units 1 & 2  
Docket Nos. 50-313 & 50-368  
License Nos. DPR-51 and NPF-6

Indian Point Nuclear Generating  
Units Nos. 1, 2 and 3 Docket Nos.  
50-003, 50-247, and 50-286  
License Nos. DPR-5, DPR-26, and  
DPR-64

Grand Gulf Nuclear Station, Unit 1  
Docket No. 50-416  
License No. NPF-29

Waterford Steam Electric Station,  
Unit 3  
Docket No. 50-382  
License No. NPF-38

James A. FitzPatrick Nuclear Power  
Plant Docket No. 50-333  
License No. DPR-59

River Bend Station  
Docket No. 50-458  
License No. NPF-47

Pilgrim Nuclear Power Station  
Docket No. 50-293  
License No. DPR-35

Vermont Yankee Nuclear Power  
Docket No. 50-271  
License No. DPR-28

Reference: Request for Use of Delta Protection Mururoa V4F1 R Supplied Air Suits (CNRO 2006-00021) dated May 16, 2006

Dear Sir or Madam:

Entergy Operations Inc. and Entergy Nuclear Operations Inc. (Entergy), in the reference above, requested authorization for use of equipment that has not been tested or certified by the National Institute for Occupational Safety and Health (NIOSH). The request was to use Delta Protection's Mururoa V4F1 R Supplied Air Suits. The request was made pursuant to 10 CFR 20.1703(b).

AGI

The NRC staff provided several questions in the form of a draft Request for Additional Information (RAI). On June 16, 2006, Entergy and members of your staff held a phone call to discuss the questions. As a result of that call, Entergy provided answers to the questions and agreed to make several new commitments. The answers to the questions are provided in Attachment 1. Test results to support requested fit factor are provided in Attachment 2. The new commitments provided in Attachment 3 are in addition to the previous commitments made in the original submittal (i.e., the referenced letter). There was one previous commitment that was worded incorrectly. Corrections to that commitment are discussed in the response to Question 6.

Should you have any questions regarding this submittal, please contact Bill Brice at (601) 368-5076.

Very truly yours,

A handwritten signature in black ink, appearing to read 'FGB/WBB/bal', written in a cursive style.

FGB/WBB/bal

Attachments:

1. Response to Request for Additional Information
2. Test Results for the MURUROA V4F1
3. List of Regulatory Commitments

cc: (see next page)

cc: Mr. M. A. Balduzzi (PILG)  
Mr. W.R. Campbell (ECH)  
Mr. F. R. Dacimo (IPEC)  
Mr. J. P. DeRoy (ECH)  
Mr. P. T. Dietrich (JAF)  
Mr. W. A. Eaton (ECH)  
Mr. R. K. Edington (CNS)  
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Mr. J. T. Herron (WPO)  
Mr. P. D. Hinnenkamp (RBS)  
Mr. M. R. Kansler (WPO)  
Mr. O. Limpias (WPO)  
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Mr. G. J. Taylor (ECH)  
Mr. J. E. Venable (W-3)  
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Mr. J. P. Boska, Project Manager, IP2, IP3, JAF  
Mr. S. J. Collins, Regional Administrator, Region I  
Mr. M. B. Fields, Project Manager, WF3  
Mr. D. G. Holland, Project Manager, ANO-1&2  
Dr. B. S. Mallett, NRC Regional Administrator, Region IV  
Mr. J. J. Shea, Project Manager, PNPS, VY  
Mr. B. K. Vaidya, Project Manager, GGNS & RBS  
Mr. M. K. Webb, Project Manager, IP1  
NRC Resident Inspectors (ANO, GGNS, IP2, IP3, JAF, RBS, PNPS, WF3, VY)

American Nuclear Insurers (Attn: Library)  
Mr. Bernard R. Bevill (Arkansas Dept. of Health (DRC & EM))  
Mr. Paul Eddy (NYS Dept. of Public Service)  
LA Dept. of Environmental Quality (OECSO)  
Mr. D. E. Levanway (Wise Carter)  
Mr. David O'Brien (Vermont DPS)  
Mr. J. Smith (Wise Carter)  
Mr. Peter R. Smith (NYSERDA)  
Mr. H. L. Thomas (SMEPA)

**ATTACHMENT 1**

**CNRO-2006-00034**

**Response to Request for Additional Information**

## **Response to Request for Additional Information**

### **Question 1**

Verify that Entergy commits to notifying the manufacturer (as well as the U. S. Nuclear Industry) of any defects experienced during the use of the MURUROA V4F1 R devices.

### **Response for Question 1**

Entergy commits to notifying the manufacturer (as well as the U. S. Nuclear Industry) of any defects experienced during the use of the MURUROA V4F1 R devices. This commitment is included in Attachment 3.

### **Question 2**

The last sentence of page 3 of Attachment 1 indicated that Entergy intends to use the V4F1 R suit in a configuration other than that for which it was certified. Specifically that Entergy intends to fit the suits with air hose fittings (Schrader and Foster type) not tested in the referenced certification. Verify that Entergy will use the suit as allowed in the certification (with CEJN or STAUBLI fittings) or provide the results of independent testing by a certifying body that demonstrates that the V4F1 R meets the EN 1073-1 standard.

### **Response for Question 2**

Entergy will use the suit as allowed in the certification (with CEJN or STAUBLI fittings).

### **Question 3**

Provide the testing data that demonstrates that the V4F1 R suit provides a fit factor of greater than 50,000.

### **Response for Question 3**

The test data demonstrating that the suit provides an average protection level (fit factor) of 50,000 is provided in Attachment 2.

### **Question 4**

Page 8 of the EC Type Examination Certificate discusses how the minimum air flow rate was verified through the entire range of air supply pressures (2.5 to 7 bars) allowed for the V4F1 R suit. Is there any limitation on the rate of change of the inlet pressure in terms of the dynamic response of the regulator? If so describe it and discuss how Entergy will ensure that the air supply at each facility meets this limitation.

#### **Response for Question 4**

There is no limitation regarding the rate of change of the inlet pressure in terms of dynamic response of the regulator. Tests have been carried out by the manufacturer with the regulator seeing incremental step changes in pressure of approximately 14 psi/step. This was done in both increasing and decreasing increments. In addition, instantaneous pressure availability such as going from 0 to 40 PSI, then shutting off the supply and re-establishing it again was conducted, all with success and stability. A test was also conducted at an instantaneous pressure of 140 PSI and then stepping down to the certified pressure range with no negative effects.

#### **Question 5**

Section 3.2 of the EC Type Examination Certification (page 12 of 16) indicates under "(t)he limits of use of the MURUROA V4F1 R suit" that "the user will have to provide himself with the necessary devices to check if the minimum air flow rate, as indicated by the manufacture, is reached or exceeded before and during wearing the suit." Describe the instrumentation and procedures that Entergy will implement to meet this limitation of use.

#### **Response for Question 5**

Entergy will perform an initial test of their breathable air network system to insure that it has sufficient capacity (minimum pressure and flow) through an established maximum length of hose, prior to the initial use of the Mururoa V4F1 R suit system. This test will establish the conditions at the distribution manifold actually necessary to ensure that the air supplied to the suit inlet is consistent with the conditions for which the equipment was certified. Entergy plants will follow the manufacturer's recommended "Instructions for Use" of the suits, specifically insuring that the minimum operating air pressure 2.5 bar (35 PSI) and airflow 450 l/min (16 CFM) is being supplied to the suits prior to working in them. Pressure will be monitored during use.

#### **Question 6**

Item number 4 in the list of commitments in Attachment 2 of the original submittal states that "All suits and cartridges will be treated as "Single Use" only." What cartridges are associated with the MURUROA V4F1 R supplied air suit?

#### **Response for Question 6**

There are no cartridges used with the MURUROA V4F1 R supplied air suits. This was an error in the original submittal. The commitment should read, "All suits will be treated as 'Single Use' only." The revised commitment is included in Attachment 3.

**ATTACHMENT 2**

**CNRO-2006-00034**

**Test Results for the MURUROA V4F1**

Test Results Carried Out on the Full Encapsulated Suit  
MURUROA V4F1 ref. 8481X1T  
For the EC Type Examination Certificate  
No. 0073/197/162/12/97/0028

Below are the detailed results that demonstrate the conformity of this equipment to the Essential Requirements of the European Standard EN 1073-1. Other results that are not pointed out in this report are already written in the EC TYPE Examination Certificate (dated December 10<sup>th</sup> 1997).

1. *Air Flow entering the suit when connected to a 6 bar feeding pressure (paragraph 2.3.2. of the EC Type Examination Certificate)*

Suit number	Minimum air flow(l/min)	Maximum air flow (l/min)
1	508	1050
2	516	1070
3	508	1050

2. *Carbon dioxide content of the inhalation air when measured at the minimum air flow of 450 l/min (paragraph 2.3.12. of the EC Examination Type)*

Suit number	Test No. 1 CO2 contents(%)	Test No. 2 CO2 contents(%)
1	0.86	0.93
2	0.68	0.68
3	0.75	0.82



3. *Noise level associated with the air supply to the suit when tested at the maximum air flow rate at 6 bar (paragraph 2.3.13 of the EC Examination Type)*

Suit number	Maximum air flow(l/min)	Noise level (dB)
1	1050	77.2
2	1070	75.1
3	1050	77.6

4. *Inward leakage average- Fit Factor measured at the minimal air flow of 450l/min (paragraph 2.3.3. of the CE Examination Type)*

Suit number \ Exercise	1	2	3
Standing still	> 120,000	> 120,000	> 120,000
Walking ( 5 km/h)	76,700	90,900	66,000
Moving arms up and down above head	113,800	> 120,000	113,800
Continuous squats	30,000	41,700	50,000
Bending forward	110,000	103,400	91,700
Person twisting at waist	> 120,000	> 120,000	> 120,000
Person crawling	55,000	> 120,000	31,400

5. *Pressure in the suit when measured at the maximum air flow when suit connected under 6 bar feeding pressure (paragraph 2.3.11. of the EC Examination Type)*

Suit number Exercise	1		2		3	
	P min(Pa)	P Max.	P min(Pa)	P Max.	P min(Pa)	P Max.
Standing still	275	280	295	305	275	280
Walking ( 5 km/h)	200	800	300	900	600	900
Moving arms up and down above head	150	400	160	420	250	800
Continuous squats	30	900	30	1050	70	1700
Bending forward	80	1550	60	1900	100	1900
Person twisting at waist	140	500	160	420	160	650
Person crawling	160	900	150	850	250	1050

6. *Air supply system (paragraph 4 - 6 of EN 1073-1)*

In accordance with the paragraph 4.6; the connection between the compressed air supply system and the suit has been tested for a steady pull of 250 N. The three suits have been tested successfully. However, there was some deformation of the fabric near the regulation air flow device. A reinforced area could certainly avoid this deformation.

**ATTACHMENT 3**

**CNRO-2006-00034**

**List of Regulatory Commitments**

### List of Regulatory Commitments

The following table identifies those actions committed to by Entergy in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE (If Required)
	ONE- TIME ACTION	CONTINUING COMPLIANCE	
Entergy commits to notifying the manufacturer (as well as the U. S. Nuclear Industry) of any defects experienced during the use of the MURUROA V4F1 R devices.		X	Following identification of defects
Entergy will use the suit as allowed in the certification (with CEJN or STAUBLI fittings).		X	Before use of suit
Procedures for use of the suit systems are 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. Prior to use, wearers are trained on these conditions of use as well as the emergency escape features of the suits.		X	Before use of suit
Entergy will perform an initial test of their breathable air network systems to insure that it has sufficient capacity (min. pressure and flow) through an established maximum length of hose, prior to the initial use of the Mururoa V4F1 R suit system. This test will establish the conditions at the distribution manifold actually necessary to ensure that the air supplied to the suit inlet is consistent with the conditions for which the equipment was certified.		X	Before use of suit
Entergy plants will follow the manufacturers recommended "Instructions for Use" of the suits, specifically insuring that the minimum operating air pressure 2.5 bar (35 PSI) and airflow 450 l/min (16 CFM) is being supplied to the suits prior to working in them. Pressure will be monitored during use.		X	Before use of suit
All suits will be treated as "Single Use" only (this commitment supersedes that of items 4 of CNRO-2006-00021).		X	Before use of suit