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G3NO-2008-00018

November 5, 2008

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

DOCKET: No. 52-024

SUBJECT: Responses to NRC Requests for Additional Information, Letter No. 13  
(GG3 COLA)

REFERENCE: NRC Letter to Entergy Nuclear, *Request for Additional Information Letter No. 13 Related to the SRP Section 14.2 for the Grand Gulf Combined License Application*, dated October 15, 2008 (ADAMS Accession No. ML082880688).

Dear Sir or Madam:

In the referenced letter, the NRC requested additional information on three items to support the review of certain portions of the Grand Gulf Unit 3 Combined License Application (GG3 COLA). The responses to the following Requests for Additional Information (RAIs) in the reference letter are provided in Attachments 1, 2 and 3 to this letter as follows:

1. RAI Question No. 14.02-1, Personnel monitors and radiation survey instruments testing
2. RAI Question No. 14.02-2, Pre-operational test for laboratory equipment
3. RAI Question No. 14.02-3, Availability of test specifications for review

Should you have any questions, please contact me or Mr. Tom Williamson of my staff. Mr. Williamson may be reached as follows:

Telephone: (601) 368-5786

Mailing Address: 1340 Echelon Parkway  
Mail Stop M-ECH-21  
Jackson, MS 39213

E-Mail Address: twilli2@entergy.com

This letter contains commitments as identified in Attachment 4.

D088  
NRO

I declare under penalty of perjury that the foregoing is true and correct.

Executed on November 5, 2008.

Sincerely,

A handwritten signature in black ink, appearing to read "WKH" followed by a stylized surname.

WKH/ghd

- Attachments:
1. Response to RAI Question No. 14.02-1
  2. Response to RAI Question No. 14.02-2
  3. Response to RAI Question No. 14.02-3
  4. Regulatory Commitments

cc (email unless otherwise specified):

Mr. T. A. Burke (ECH)  
Mr. S. P. Frantz (Morgan, Lewis & Bockius)  
Mr. B. R. Johnson (GE-Hitachi)  
Ms. M. Kray (NuStart)  
Mr. P. D. Hinnenkamp (ECH)

NRC Project Manager – GGNS COLA  
NRC Director – Division of Construction Projects (Region II)  
NRC Regional Administrator - Region IV  
NRC Resident Inspectors' Office - GGNS

**ATTACHMENT 1**

**G3NO-2008-00018**

**RESPONSE TO NRC RAI LETTER NO. 13**

**RAI QUESTION NO. 14.02-1**

**RAI QUESTION NO.14.02-1**

**NRC RAI 14.02-1**

FSAR Section 14.2.9.1.3 describes the preoperational test for personnel monitors and radiation survey instruments. Please provide amplifying information as follows:

- A. Describe the general types of personnel monitors and radiation survey instruments that are covered by this test.
- B. Under the heading "Prerequisites", the text states that "High radiation alarm setpoints have been properly established based on sensor location, background radiation level, expected radiation level and low occupational dose prior to the test." Explain how the specification "low occupational dose" is used as an input in establishing radiation alarm setpoints for the personnel monitors and radiation survey instruments covered by this preoperational test.

**Entergy Response**

- A. Description of Personnel Monitors and Radiation Survey Equipment in the Initial Test Program (ITP)

Site-specific personnel monitors and radiation survey instruments were originally included as part of the preoperational test program based on the guidance in Regulatory Guide (RG) 1.68, Appendix A, Item 1.k(2). However, after further evaluation, Entergy has determined that the Radiation Protection Program (RPP) adequately tests this equipment. In addition, the equipment does not meet the RG 1.68 criteria for plant features to be tested in the Initial Test Program (ITP) or the objectives of the ITP, which includes pre-operational testing that are defined in DCD Section 14.2.1. Therefore, this equipment will be tested in accordance with the RPP, and is not included in the ITP.

Site-specific personnel monitors and radiation survey instruments are purchased as standard commercial grade equipment and are routinely replaced over the life of the plant. Each new survey instrument or personnel monitor is tested prior to being placed in service to assure conformance with performance requirements. Testing of this equipment is governed by ANSI/IEEE N323A, "Radiation Protection Instrumentation Test and Calibration, Portable Survey Instruments," which is applicable to the ESBWR (refer to DCD Table 1.9-22) and ANSI/IEEE, N323D, "Installed Radiation Protection Instrumentation." These standards, or replacement standards, are applicable to personnel monitors and radiation survey instruments that are purchased to support the plant prior to fuel load as well as to replacements that are purchased throughout the life of the plant. This testing is performed under the control of the RPP.

- B. Use of "Low Occupational Dose" in Establishing Setpoints

Entergy's use of the terminology "low occupational dose" was erroneous and will be removed by deleting FSAR Section 14.2.9.1.3. Radiation alarm setpoints for personnel monitors and radiation survey instruments are established by the RPP. These instruments are calibrated in accordance with the ANSI standards discussed in Section A, above.

**Proposed COLA Revision**

FSAR Table 1.9-201 and FSAR Table 1.9-202 will be revised to indicate exception to RG 1.68, Item 1.k(2), "personnel monitors and radiation survey instruments" as indicated in the attached draft markups.

FSAR Table 1.9-204 will be revised to include ANSI/IEEE, N323D, "Installed Radiation Protection Instrumentation" as indicated in the attached draft markups.

Note that FSAR Table 1.9-201 and FSAR Table 1.9-202 will be revised to indicate exception to RG 1.68, Item 1.k(3), "laboratory equipment used to analyze or measure radiation levels and radioactivity concentrations," in response to RAI Question No. 14.02-2 (see Attachment 2) as indicated in the attached draft markups.

FSAR Section 14.2.9.1.3 will be deleted.

### **Markup of Grand Gulf COLA**

The following markup represents Entergy's good faith effort to show how the COLA will be revised in a future COLA submittal in response to the subject RAI. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be somewhat different than as presented herein.

Grand Gulf Nuclear Station, Unit 3  
COL Application  
Part 2, FSAR

TABLE 1.9-201 (Sheet 48 of 60)  
CONFORMANCE WITH STANDARD REVIEW PLAN

GGNS COL 1.9-3-A

SRP Section	Title	Rev	Date	Specific Acceptance Criteria	Evaluation
13.6.1	Physical Security - Combined License Review Responsibilities	Initial Issuance	Mar-07		Addressed in COLA Part 8.
13.6.2	Physical Security - Design Certification	Initial Issuance	Mar-07		Not applicable. Applies to design certification applications.
13.6.3	Physical Security - Early Site Permit	Initial Issuance	Mar-07		Not applicable. Applies to ESP applications.
14.2	Initial Plant Test Program - Design Certification and New License Applicants	Rev. 3	Mar-07	1A, 1B, 1C, 2A, COL/OL Applicants: 3A, 3B, 3C, 3D, 3E, 3F, 3G, 3H, 4A, 4B, 5A, 5B, 6A, 6C	<u>Conforms with the following exception: Refer to Table 1.9-202 for exceptions to RG 1.68.</u>
				5C	Not applicable. No first-of-a-kind features utilized in the facility.
				5D	Not applicable. No test exceptions have been identified.
				6B	Not applicable. FSAR references a certified design.
				DC Applicants: 3A, 3B, 3C, 3D, 4A, 6A, 6B, 6C	Not applicable. Applies to DC applicants.
14.2.1	Generic Guidelines for Extended Power Uprate Testing Programs	Initial Issuance	Aug-06		Not applicable. Applies to power uprates.

TABLE 1.9-202 (Sheet 9 of 32)  
CONFORMANCE WITH REGULATORY GUIDES

GGNS COL 1.9-3-A

RG Number	Title	Revision	Date	RG Position	Evaluation
1.60	Design Response Spectra for Seismic Design of Nuclear Power Plants	Rev. 1	Dec-73	General	Conforms
1.61	Damping Values for Seismic Design of Nuclear Power Plants	Rev. 1	Mar-07	General	Conforms
1.62	Manual Initiation of Protective Actions	Rev. 0	Oct-73	General	Conforms
1.63	Electric Penetration Assemblies in Containment Structures for Nuclear Power Plants	Rev. 3	Feb-87	General	Conforms
1.65	Materials and Inspections for Reactor Vessel Closure Studs	Rev. 0	Oct-73	General	Conforms
1.68	Initial Test Programs for Water-Cooled Nuclear Power Plants	Rev. 2	Aug-78	General	Conforms with the following exception: <u>Equipment listed in Appendix A, Items 1.k(2) and 1.k(3) not included in the initial test program.</u>
1.68.1	Preoperational and Initial Startup Testing of Feedwater and Condensate Systems for Boiling Water Reactor Power Plants	Rev. 1	Jan-77	General	Conforms
1.68.2	Initial Startup Test Program to Demonstrate Remote Shutdown Capability for Water-Cooled Nuclear Power Plants	Rev. 1	Jul-78	General	Conforms
1.68.3	Preoperational Testing of Instrument and Control Air Systems	Rev. 0	Apr-82	General	Conforms
1.69	Concrete Radiation Shields for Nuclear Power Plants	Rev. 0	Dec-73	General	Conforms



**TABLE 1.9-204 (Sheet 1 of 6)  
INDUSTRIAL CODES AND STANDARDS**

GGNS SUP 1.9-1

Code or Standard Number	Year	Title
<b>American National Standards Institute</b>		
<u>N323D</u>	<u>2002</u>	<u>Installed Radiation Protection Instrumentation</u>
<b>American Nuclear Society (ANS)</b>		
3.1	1993	Selection, Qualification, and Training of Personnel for Nuclear Power Plants
<b>American Society of Civil Engineers (ASCE)</b>		
ASCE 43-05	2005	Seismic Design Criteria for Structures, Systems, and Components in Nuclear Facilities
<b>American Society of Mechanical Engineers (ASME)</b>		
A-17.1	2007	Safety Code for Elevators and Escalators
B31.1	2007	Power Piping
NQA-1	1994	Quality Assurance Requirements for Nuclear Facility Applications
Boiler and Pressure Vessel Code, Section IX	2007	Qualification Standard for Welding and Brazing Procedures, Welder, Brazers and Welding and Brazing Operators
<b>ASTM International</b>		
D422-63(2002)e1	2002	Standard Test Method for Particle-Size Analysis of Soils
D698-00e1	2000	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft <sup>3</sup> (600 kN-m/m <sup>3</sup> ))
D854-06	2006	Standard Test Methods for Specific Gravity of Soil Solids by Water Pycnometer
D1452-80	2000	Standard Practice for Soil Investigation and Sampling by Auger Borings

- Proper operation of freeze protection methods and devices, where installed; and
- Acceptability of pump/motor vibration levels.

14.2.9.1.3 ~~Personnel Monitors and Radiation Survey Instruments  
Preoperational Test~~[Deleted]

**Purpose**

~~To verify the ability of the personnel monitors and radiation survey equipment to indicate and alarm normal and abnormal radiation levels.~~

**Prerequisites**

~~The construction tests have been successfully completed and the SCG has reviewed the test procedure and approved the initiation of testing. High radiation alarm setpoints have been properly established based on sensor location, background radiation level, expected radiation level and low occupation dose prior to the test. Indicator, power supplies, and sensor/converters have been calibrated according to vendor instructions.~~

**General Test Methods and Acceptance Criteria**

~~Operation is observed and recorded during a series of individual component and integrated subsystem tests to demonstrate the following:~~

- ~~Proper functioning of indicators, annunciators, and audible alarms;~~
- ~~Proper alarm at correct prescribed setpoints in response to high radiation and downscale/inoperative conditions; and~~
- ~~Proper functioning and operation of the self test feature for gross failure and loss of power detection.~~

14.2.9.1.4 [Deleted]

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14.2.9.2 SITE-SPECIFIC STARTUP TESTS

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Replace this section with the following.

14.2.9.2.1 Cooling Tower Performance Test

GGNS SUP 14.2-3 **Purpose**

**ATTACHMENT 2**

**G3NO-2008-00018**

**RESPONSE TO NRC RAI LETTER NO. 13**

**RAI QUESTION NO. 14.02-2**

**RAI QUESTION NO.14.02-2**

**NRC RAI 14.02-2**

In FSAR Section 14.2.9.1, Site-specific Pre-Operational Tests, GGNS SUP 14.2-1 addresses pre-operational tests applicable to FSAR 14.2.9.1.3, Personnel Monitors and Radiation Survey Instruments Preoperational test. The staff notes that RG 1.68 (Appendix A, Section 1.k (Preoperational Testing-Radiation Protection Systems)) includes "laboratory equipment used to analyze or measure radiation levels and radioactivity concentrations" as one of the system types that should receive preoperational testing to demonstrate proper operation. Please include a site-specific pre-operational test for laboratory equipment in FSAR Section 14.2.9.1 or justify the absence of such testing.

**Entergy Response**

Site-specific laboratory equipment used to analyze or measure radiation levels and radioactivity concentrations is purchased as standard commercial grade equipment, typically not specific to any particular reactor plant design, and routinely replaced over the life of the plant. Entergy has determined that the Radiation Protection Program (RPP) adequately tests this equipment, and that the equipment does not meet the RG 1.68 criteria for plant features to be tested in the Initial Test Program (ITP) or the objectives of the ITP, which includes pre-operational testing, that are defined in DCD Section 14.2.1. Therefore, this equipment will be tested in accordance with the RPP, and is not included in the ITP.

Manufacturer recommended testing of this equipment, performed per the quality assurance program (QAP) for RPP, is not typically once-in-a-lifetime testing that would be consistent with an ITP test.

Operation of laboratory equipment is governed by Regulatory Guide (RG) 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and The Environment." Entergy's conformance with RG 4.15 is described in FSAR Table 1.9-202. Implementation of this RG justifies the absence of a site-specific preoperational test for laboratory equipment.

Section 6 of RG 4.15 specifies the guidelines for quality control in the laboratory, including the use of radionuclide reference standards, involved in the calibration of radiation measurement systems that analyze or measure radiation levels and radioactivity concentrations. This RG also specifies the use of intralaboratory and interlaboratory analysis, as well as the use of planned and periodic audits to verify implementation of the RG 4.15 QAP.

Based on implementation of a RG 4.15 QAP for laboratory equipment, including this equipment in the ITP is not necessary.

**Proposed COLA Revision**

FSAR Table 1.9-201 and FSAR Table 1.9-202 will be revised to indicate exception to RG 1.68, Item 1.k(3), "laboratory equipment used to analyze or measure radiation levels and radioactivity concentrations" as indicated in the draft markups included with the response to RAI Question No. 14.02-1 in Attachment 1 to this letter.

**ATTACHMENT 3**

**G3NO-2008-00018**

**RESPONSE TO NRC RAI LETTER NO. 13**

**RAI QUESTION NO. 14.02-3**

**RAI QUESTION NO.14.02-3**

**NRC RAI 14.02-3**

SRP 14.2, Section II, Acceptance Criteria, Section E, "Development, Review and Approval of Test Procedures," subsections i through vii, contain guidance on test specifications that should be available to the NRC staff for the development of individual test procedures. RG 1.68, Regulatory Position C.4, states, "Approved test procedures for satisfying FSAR testing commitments should be made available to the NRC approximately 60 days prior to their intended use." RG 1.206, Regulatory Position, C. I.14.2.3, states, "the COL applicant should also describe the types and sources of design performance requirements and acceptance criteria used to develop detailed test procedures for testing plant SSCs."

In addition, RG 1.206, Regulatory Position, C.III.4.3, states, in part, that "the COL applicant should describe in its application (e.g., within the appropriate section of the FSAR) the proposed approach to addressing a COL information item in sufficient detail to support the NRC licensing finding and includes the requirements for updating the affected document (e.g., the FSAR update process). Otherwise, inform the NRC staff of the final disposition of the COL information item. The descriptions provided should include implementation schedules to allow the coordination of activities with the NRC construction inspection program."

GGNS Unit 3 FSAR Section 14.2.9 of the COLA, "Site-Specific Preoperational and Startup Tests," includes a plant specific COL item identified as GGNS COL Item 14.2-4-H which describes the site specific pre-operational and initial startup tests not addressed in DCD Section 14.2.8. GGNS Unit 3 FSAR Section 14.2.9, states, in part, "Site-specific preoperational and startup tests are in accordance with the system specifications and associated equipment specifications. The tests demonstrate that the installed equipment and systems perform within the limits of these specifications."

To ensure that test procedures are developed in accordance with established methods and appropriate acceptance criteria, the COL licensee should make available to the NRC 60 days prior to intended use, the test specifications that describe the types and sources of design performance requirements and acceptance criteria used to develop detailed test procedures for testing plant SSCs. Discuss your plans for a commitment in FSAR Section 14.2.9 for plant specific COL item, GGNS COL item 14.2-4-H, to make available the test specifications for NRC inspection or justify your basis for not including this commitment.

**Entergy Response**

Along with the procedures that would be made available to the NRC, as discussed in FSAR Section 14.2.9, Entergy would make available the inputs used to develop the procedures. This would include system specifications, associated equipment specifications, and any applicable test specifications that describe the types and sources of design performance requirements, and acceptance criteria used to develop the detailed test procedures for testing plant SSCs.

**Proposed COLA Revision**

FSAR Section 14.2.9 will be revised to clarify Entergy's intent to make the procedure development inputs available to the NRC staff, along with the procedures, no later than 60 days prior to intended use for preoperational tests, and not less than 60 days prior to scheduled fuel load for startup tests.

### **Markup of Grand Gulf COLA**

The following markup represents Entergy's good faith effort to show how the COLA will be revised in a future COLA submittal in response to the subject RAI. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be somewhat different than as presented herein.



Add the following at the end of this section.

STD SUP 14.2-2 Startup test reports are prepared in accordance with RG 1.16.

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#### 14.2.7 TEST PROGRAM SCHEDULE AND SEQUENCE

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Replace the last paragraph with the following.

STD COL 14.2-4-H The detailed testing schedule will be developed and made available for review prior to actual implementation. The schedule may be updated and continually optimized to reflect actual progress and subsequent revised projections.

The implementation milestones for the Initial Test Program are provided in Section 13.4.

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#### 14.2.8.1.36 AC Power Distribution System Preoperational Test

##### **General Test Methods and Acceptance Criteria**

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Add the following at the end of this section.

- STD SUP 14.2-4
- Proper operation of the automatic transfer capability of the normal preferred power source to the alternate preferred power source.
- 

#### 14.2.9 SITE-SPECIFIC PREOPERATIONAL AND STARTUP TESTS

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Replace the second and third paragraphs with the following.

GGNS COL 14.2-5-A This section describes the site specific pre-operational and initial startup tests not addressed in DCD Section 14.2.8.

GGNS COL 14.2-6-H ~~Specific testing to be performed and the applicable acceptance criteria for each preoperational and startup test are documented in test procedures to be made available to the NRC approximately 60 days prior to their intended use for preoperational tests, and not less than 60 days prior to schedule fuel load for initial startup tests.~~ Site-specific preoperational and startup tests are in

accordance with the system specifications, ~~and associated equipment specifications, and any applicable test specifications for equipment in these systems and equipment~~ provided by the licensee that are not part of the standard plant described in DCD Section 14.2.8. The tests demonstrate that the installed equipment and systems perform within the limits of these specifications. Specific testing to be performed and the applicable acceptance criteria for each preoperational and startup test are documented in test procedures. These test procedures, and inputs used in development of the procedures, such as the system specifications, equipment specifications, and any applicable test specifications, will be made available to the NRC approximately 60 days prior to their intended use for preoperational tests, and not less than 60 days prior to scheduled fuel load for initial startup tests.

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#### 14.2.9.1 SITE-SPECIFIC PREOPERATIONAL TESTS

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Replace this section with the following.

##### 14.2.9.1.1 Station Water System Pre-Operation Test

GGNS SUP 14.2-2

#### **Purpose**

The objective of this test is to verify proper operation of the SWS and its ability to supply design quantities and quality of water to the CIRC, PSWS cooling tower basin, MWS, and FPS.

#### **Prerequisites**

The construction tests have been successfully completed and the SCG has reviewed the test procedure and approved the initiation of testing. Electrical power, the CIRC, PSWS, MWS and FPS, instrument air, Chemical Storage and Transfer System, and other required interfacing systems are available, as needed, to support the specified testing.

#### **General Test Methods and Acceptance Criteria**

Performance is observed and recorded during a series of individual component and integrated system tests to demonstrate the following:

- Proper operation of instrumentation and equipment in appropriate design combinations of logic and instrument channel trip;
- Proper functioning of instrumentation and alarms used to monitor system operation and availability;

**ATTACHMENT 4**

**G3NO-2008-00018**

**REGULATORY COMMITMENTS**

**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	
Personnel radiation monitors and radiation survey equipment will be tested in accordance with the Radiation Protection Program (RPP).	✓		Future COLA submittal.
FSAR Table 1.9-201 and FSAR Table 1.9-202 will be revised to indicate exception to Regulatory Guide (RG) 1.68, Item 1.k(2), "personnel monitors and radiation survey instruments" as indicated in the attached draft markups.	✓		Future COLA submittal.
FSAR Table 1.9-204 will be revised to include ANSI/IEEE, N323D, "Installed Radiation Protection Instrumentation" as indicated in the attached draft markups.	✓		Future COLA submittal.
FSAR Tables 1.9-201 and 1.9-202 will be revised to indicate exception to RG 1.68, Item 1.k(3), "laboratory equipment used to analyze or measure radiation levels and radioactivity concentrations," in response to RAI Question No. 14.02-2 (see Attachment 2) as indicated in the attached draft markups.	✓		Future COLA submittal.
FSAR Section 14.2.9.1.3 will be deleted.	✓		Future COLA submittal.
FSAR Section 14.2.9 will be revised to clarify Entergy's intent to make the procedure development inputs available to the NRC staff, along with the procedures, no later than 60 days prior to intended use for preoperational tests, and not less than 60 days prior to scheduled fuel load for startup tests.	✓		Future COLA submittal.