GE Energy

David H. Hinds
Manager, ESBWR

PO Box 780 M/C L60
Wilmington, NC 28402-0780
USA

T 910 675 6363
F 910 362 6363
david.hinds@ge.com

MFN 06-074 Supplement 1

Docket No. 52-010

December 6, 2006

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Subject: **Supplemental Response to Portion of NRC Request for Additional Information Letter No. 76 – Instrumentation and Control Systems – RAI Number 7.7-1 S01**

Enclosure 1 contains GE's response to the subject NRC supplemental RAI transmitted via the Reference 1 letter. The original RAI was transmitted via the Reference 2 letter.

If you have any questions about the information provided here, please let me know.

Sincerely,

Kathy Sedney for

David H. Hinds
Manager, ESBWR

D068

Reference:

1. MFN 06-388, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 76 Related to ESBWR Design Certification Application*, October 11, 2006
2. MFN 06-045, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 06 Related to ESBWR Design Certification Application*, January 31, 2006

Enclosure:

1. MFN 06-074 Supplement 1– Supplemental Response to Portion of NRC Request for Additional Information Letter No. 76 – Related to ESBWR Design Certification Application — RAI Number 7.7-1 S01

cc: AE Cubbage USNRC (with enclosures)
GB Stramback GE/San Jose (with enclosures)
eDRF 0000-0060-3410

Enclosure 1

MFN 06-074 Supplement 1

Supplemental Response to Portion of NRC Request for

Additional Information Letter No. 76

Related to ESBWR Design Certification Application

Instrumentation and Control Systems

RAI Number 7.7-1 S01

NRC RAI 7.7-1 S01

Address concerns and provide details as identified in SRP 7.7, Control Systems, for each of the control systems NOT listed in Section 7.7.0 of the DCD.

Address concerns of SRP Section 7.7, Revision 4 - 06/1997, Section II. Acceptance Criteria, and provide detailed information for the major design considerations identified in Section III of SRP 7.7, for each of the control systems NOT listed in 7.7.0 of the DCD.

GE's response in enclosure 1 to MFN 06-074: The general design bases and acceptance criteria for some of the above control systems are addressed in Sections 1.2.2 and Tables 1.9-7 and 1.11-1 of DCD Tier 2. In addition, the specific system design bases of the appropriate control systems are discussed in the Tier 2 section that are listed below. These control systems will be controlled by a single failure proof DCIS with instrumentation that supports single failure proof for power generation and (where applicable) segmentation into PIP A and B such that either "half"can run independently of the other - complementing both the electrical power sources and physical separation. The design and acceptance criteria for software based control systems are addressed in DCD, Tier 2, Revision 1, Section 7B. (Also, a chart is provided cross referencing systems to DCD Tier 2 Sections).

Staff's requested information: Particularly for those systems which are not part of Chapter 7, will still require the review methods and consideration of the topics listed in SRP Chapter 7, Appendix 7.1-A,Acceptance Criteria and Guidelines for Instrumentation and Control systems Important to Safety". In that appendix, Section 2.d references GDC Criterion 13, "Instrumentation and Controls" as applicable to all I&C systems and the necessary considerations. Example: HVAC -CBHVS (Control Building HVAC System) is a non-safety system except the CRHA (Control Room Habitability Area) envelope and EBAS (Emergency Breathing Air System) which are safety related. A safety design basis should identify the safety related instrumentation and how they are used and in what events. The interface to the safety communication system should be defined. In the response, the statement on control systems should be extrapolated and used in the design basis for this and all the control systems listed in DCD Section 7.7.

GE Response

Control systems not included in Chapter 7 meet the requirements of GDC 13. Control and instrumentation is provided to operate the system, monitor process variables during startup, normal, and abnormal plant operation. Plant sensor and actuator interface with the safety and non-safety control systems is described in Section 7.9.1 and 7.9.2, respectively. DCD Section 7.9 describes the plant level Instrumentation and Controls DCIS and shows compliance to GDC 13.

The following statement will be added to the DCD Tier 2 Sections listed in the following table.

> "This instrumentation conforms with GDC 13. Refer to Subsection 3.1.2 for a general discussion of the GDC."

DCD Tier 2 Section	Description
5.4.8	Reactor Water Cleanup/Shutdown Cooling System
7.3.2*	Passive Containment Cooling System
9.2.1.5	Plant Service Water System
9.2.2.5	Reactor Component Cooling Water System
9.2.3.5	Makeup Water System
9.2.6.5	Condensate Storage and Transfer System
9.2.7.5	Chilled Water System
9.2.8.5	Turbine Component Cooling Water System
9.3.6	Instrument Air System
9.3.7	Service Air System
9.4.1.5	Control Room Area Ventilation System
9.4.2.5	Fuel Building HVAC System
9.4.3.5	Radwaste Building HVAC System
9.4.4.5	Turbine Building HVAC System
9.4.6.5	Reactor Building HVAC System
9.4.7.5	Electrical Building HVAC System
9.4.8.5	Drywell Cooling System
9.4.9.5	Containment Inerting System

* The Passive Containment Cooling System (PCCS) does not have instrumentation, control logic, or power operated valves as described in Section 7.3.2.

DCD Impact

DCD Tier 2 Rev. 3 will include a revision as described above.