



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

December 11, 1995

LICENSEE: Entergy Operations, Inc. (EOI)  
FACILITY: Grand Gulf Nuclear Station  
SUBJECT: OCTOBER 24, 1995, MEETING SUMMARY REGARDING EOI'S PROPOSED  
PLAN TO IMPLEMENT ITS GRADED QUALITY ASSURANCE (QA) PROGRAM  
(TAC NO. M92420)

On October 24, 1995, representatives of EOI briefed NRC staff at One White Flint North (OWFN) offices regarding aspects of their proposed plan to implement a graded QA program at GGNS. Meeting attendee list and meeting handouts are attached.

EOI provided a comprehensive discussion of their activities to date in developing its graded QA approach for the determination of GGNS' "low safety significant" (LSS) procurement controls, and provided several specific LSS component examples for discussion. EOI and the staff discussed several aspects of their program implementation including: identification of SSC safety significance classification and safety functions; identification of applicable regulatory, contractual, and design requirements and commitments; and the determination of GGNS procurement requirements.

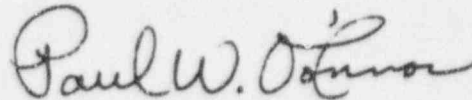
The NRC staff and GGNS personnel discussed the potential of GGNS downgrading seismic classifications of safety-related systems, such as the Standby Liquid Control System (SLC), and its integration of 10 CFR 50.59 into the GGNS design change process. The staff expressed some skepticism regarding GGNS' proposed downgrading of seismic requirements for systems important to safety and suggested that additional discussions are warranted between the staff and GGNS personnel on the proposed changes. In addition, after observing GGNS' expert panel meeting during July, 1995, the staff also expressed some skepticism regarding methodology employed for determining system risk-significance which resulted in some systems, such as the SLC system, being categorized as "low safety significant."

Additionally, the NRC staff and GGNS personnel discussed the potential downgrading of ASME Class 1/2/3 components and compliance to NRC and industry regulations, such as Appendix B to 10 CFR part 50 and the ASME Code. That is,

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downgrading of ASME system classifications, but not necessarily individual components, may need to be coordinated with the staff before changes are made at EOI facilities and prior NRC approval may need to be requested before EOI changes the associated licensing commitments (e.g., ASME).



Paul W. O'Connor, Senior Project Manager  
Project Directorate IV-1  
Division of Reactor Projects - III/IV  
Office of Nuclear Reactor Regulation

Docket Nos. 50-416

Attachments: 1. Meeting Attendees List  
2. Meeting Handout Material

cc w/attachments: See next page

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EButcher (010E4)  
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RGramm (010A19)  
WHaass (010A19)  
GHammer (07E23)  
THilitz (010E4)  
KManoly (07E23)  
CPetrone (010A19)  
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JPetrosino (09A1)  
WReckley (010A19)  
CSerpan (T10C9)  
MModes, RI  
JBlake, RII  
RWiseman, RII  
RGardner, RIII  
WAng, RIV  
ACRS

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downgrading of ASME system classifications, but not necessarily individual components, may need to be coordinated with the staff before changes are made at EOI facilities and prior NRC approval may need to be requested before EOI changes the associated licensing commitments (e.g., ASME).

Original Signed By:

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Grand Gulf Nuclear Station

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MEETING WITH ENERGY OPERATIONS , INC.  
REGARDING GRADED QUALITY ASSURANCE

October 24, 1995

NAME	ORGANIZATION	TITLE
C. Abbott	EOI	Quality Supervisor
D. Bost	EOI	Director, Design Engineering
S. Davis	EOI	Supervisor, M&Is
M. Meisner	EOI	Director, NSRA
T. Cannon	APS-PVNGS	Dept-LDR Engineering
N. Chapman	Bechtel-SERCH	SERCH Manager
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R. Gramm	NRC/NRR	Section Chief, QA
W. Haass	NRC/NRR	Sr. Reactor Engineer
G. Hammer	NRC/NRR	Mechanical Engineer
T. Hiltz	NRC/NRR	Sr. Reliability Risk Analyst
S. Jones	NRC/NRR	Reactor Systems Engineer, SPLB
K. Manoly	NRC/NRR	Section Chief, EMEB
P. O'Connor	NRC/NRR	GGNS Project Manager
C. Petrone	NRC/NRR	Operations Engineer
J. Peralta	NRC/NRR	Operations Engineer
J. Petrosino	NRC/NRR	Q.A. Specialist
W. Reckley	NRC/NRR	Q.A. Section
M. Rubin	NRC/NRR	Section Chief, SPSB
C. Serpan	NRC/RES	Chief, Generic Safty Iss Br.
B. Boger	NRC/NRR	Director, DRCH
L. Spessard	NRC/NRR	Deputy Director, DRCH

## **Quality Assurance Criteria**

### **Procurement of Low Safety Significance Components**

#### **Introduction**

Implementation of graded QA at Grand Gulf will be accomplished in a phased manner. It is expected that various aspects of the program will change as experience is gained with graded QA and as graded QA concepts are applied to new areas of site operation.

In its initial stages, the Grand Gulf implementation of graded QA focuses on a graded procurement process. To implement graded procurement two major objectives must be met:

- Development and application of technical criteria to identify those systems and components that are important to safety, and
- Development of quality assurance criteria to be applied to components that are determined to not be important to safety (i.e., LSSCs - low safety significance components).

The first objective was completed through expert panel revision to and concurrence with the EPRI report [later].

The second objective is addressed by this position paper.

#### **Objective of Graded Procurement**

The purpose of graded procurement is to restore flexibility in the allocation of resources by eliminating the "quality assurance premium" associated with purchasing LSSCs. In other words, the cost of components purchased "Q" is often several times the cost of an identical component without the "Q" pedigree. Since the cost differential for "Q" components is largely due to the application of a vendor's Appendix B program, the basic tenet for graded procurement of LSSCs is the elimination of the requirement for a vendor to have an Appendix B program.

#### **Quality Assurance Criteria for LSSCs - Overview**

The elimination of Appendix B vendor requirements for LSSCs is the only substantive reduction in quality assurance controls for LSSCs. Since the LSSC

is not important to safety, its procurement pedigree may be downgraded in compliance with Appendix B's directive to apply quality assurance consistent with an SSC's safety importance. With one exception, all other Appendix B criteria will remain unchanged or increase, as discussed below.

It should also be noted that Appendix B "pedigree" for LSSCs will often be replaced by other quality standards as a natural result of the engineering design process. Although not necessary, specifying that components be purchased to standards such as B31.1 or UL certified, confers added confidence in manufacturing/materials processes for LSSCs.

### **Application of Appendix B Criteria to LSSCs for Graded Procurement**

Few changes in Appendix B applications are necessary to implement a graded procurement program:

- Criterion IV (Procurement Document Control) and Criterion VII (Control of Purchased Material, Equipment and Services) will result in reduced levels of quality assurance oversight (although, not a reduction in commitment as defined by 10CFR50.54) for LSSCs compared to SSCs important to safety,
- Criterion XV (Nonconforming Materials, Parts or Components), Criterion XVI (Corrective Action) and Criterion XVIII (Audits) will result in additional quality assurance oversight for LSSCs compared to SSCs important to safety, and
- The remainder of the Appendix B criteria will continue to be applied in the same fashion as for SSCs important to safety<sup>1</sup>.

The application of each Appendix B criterion in the Grand Gulf quality assurance program is discussed below for LSSCs.

#### Criterion I - Organization

No change.

#### Criterion II - Quality Assurance Program

No change.

This criterion requires grading.

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<sup>1</sup> As Grand Gulf applies graded QA to processes other than procurement, it is expected that additional quality assurance criteria for LSSCs will be developed. For instance, Criterion VI (Document Control) may be addressed to allow variation in the procedure change process depending upon whether a component is important to safety or an LSSC. These changes, however, are not being pursued as part of the graded procurement effort.



### Criterion III - Design Control

No change.

Upon request, the design organization will specify the functional attributes necessary to satisfy the safety classification, regulatory requirements, commitments and economic performance characteristics for any SSC. Such specifications are part of the standard PERR (Procurement Engineering Request/Response) process, which will require no change for graded procurement.

From a Design Control viewpoint, it should be noted that the only effect of graded procurement will be elimination of the need to specify purchase from a vendor with an Appendix B program. All design requirements and commitments (e.g., EQ, seismic, ASME classes, 10CFR21, etc.) remain unaffected by graded QA and must be complied with.

### Criterion IV - Procurement Document Control

LSSCs will be designated in appropriate databases as not important to safety. This designation will be understood to allow the purchase of the LSSC from a vendor without an Appendix B program. Such designation only refers to quality assurance procurement controls - it has no effect on other requirements/commitments that apply to the LSSC and their resulting specification by the design authority.

### Criterion V - Instructions, Procedures and Drawings

No change.

### Criterion VI - Document Control

No change.

### Criterion VII - Control of Purchased Material, Equipment and Services

Appropriate procedures will be changed to allow the use of "certified inspectors" rather than "quality inspectors" for the receipt inspection of LSSCs that are safety-related. For this purpose, "certified inspectors" are individuals capable and qualified (via training, qual cards, etc.) to perform the receipt inspection rather than "quality inspectors" certified to ANSI 45.2.6.

The implementation of other portions of Criterion VII is unchanged.

Criterion VIII - Identification and Control of Materials, Parts and Components

No change.

For components that are identical except for pedigree, creation of a new stock code is automatic, and such components are physically segregated.

Criterion IX - Control of Special Processes

No change.

Criterion X - Inspection

No change.

Criterion XI - Test Control

No change.

Criterion XII - Control of Measuring and Test Equipment

No change.

Criterion XIII - Handling, Storage and Shipping

No change.

Criterion XIV - Inspection, Test and Operating Status

No change.

Criterion XV - Nonconforming Materials, Parts or Components

and

Criterion XVI - Corrective Action

Quality assurance controls will be increased.

For some time after implementation of graded procurement, Grand Gulf will have identical components in both important to safety and LSSC applications. If failures of LSSCs occur, the quality assurance program must be able to identify when failure modes may be significant for identical (including pedigree) components in applications important to safety. In other words, if the failure mode could be generic to such components, the corrective action program must

ensure that necessary corrective action is applied to the important to safety components.

Appropriate deficiency procedures and forms will be changed to include a question to determine if the component failure mode could be generic and, if so, to apply corrective action to identical components serving important to safety functions. In support of enhancements to Criterion XVIII below, the same procedures will also be changed to include a means to identify when deficiencies occurred on LSSCs.

#### Criterion XVII - Quality Assurance Records

No change.

#### Criterion XVIII - Audits

Quality assurance controls will be increased.

The failure of an LSSC, by definition, should have no perceptible adverse impact on safety. However, since graded procurement will result in numerous components being purchased from vendors who do not have an Appendix B program, some additional care should be taken in ensuring that the cumulative safety impact due to graded procurement is minimal. As a prudent measure, Grand Gulf intends to conduct a periodic assessment of LSSC failures to determine if the cumulative effect of such measures results in a perceptible decrease in safety. Should such a situation be discovered, it would constitute a significant condition adverse to quality to be resolved appropriately in accordance with Criterion XVI.

The Quality Programs organization will conduct an assessment in conjunction with appropriate technical personnel every two years to determine if a cumulative safety impact results from not requiring a vendor Appendix B program when purchasing LSSCs. Assessments may be discontinued when it is apparent that no cumulative safety impact results from graded procurement.

To facilitate document retrievability for the assessment, appropriate deficiency procedures and forms will be changed to include a means of identifying which deficiencies are associated with LSSC failures.

GRADED QA APPROACH TO DETERMINATION  
OF LSS PROCUREMENT REQUIREMENTS

- I. IDENTIFY SAFETY SIGNIFICANCE CLASSIFICATION PER GRADED QA PROGRAM
- II. IDENTIFY SPECIFIC SAFETY FUNCTION(S) (PER GES-04)
  - A. Plant Licensing Basis
  - B. Design Basis Accident and Transients
  - C. Functions and Systems relied on to mitigate design basis accidents and transients
  - D. Functions and Systems needed to satisfy safety related criteria and single failure criterion
  - E. System safety related functional boundaries
  - F. Components needed for system safety related functions and safety related/non-safety related interface requirements
- III. IDENTIFY APPLICABLE REQUIREMENTS AND COMMITMENTS (PER GES-04)
  - A. EQ
  - B. Seismic
  - C. ASME
  - D. Containment Isolation (Reg. Guide 1.63)
  - E. Separation Requirements (Reg. Guide 1.75)
  - F. Effects on SS components/systems
  - G. Other commitments/requirements
- IV. DETERMINE PROCUREMENT REQUIREMENTS (PER GES-05)
  - A. Commercial Grade - Non-safety related or LSS having no effect on performance of SS components or systems (i.e. misclassified as safety-related)
  - B. Commercial Grade Dedication - Performed to only address those characteristics determined critical to the performance of the components SS function & safety function (GES-02)
  - C. Full Appendix B QA Procurement if necessary or impractical to dedicate

GRADED QA APPROACH TO DETERMINATION  
OF LSS PROCUREMENT REQUIREMENTS

EXAMPLE: Pressure Gauge  
Sycon Corp. - S713D 4 1/2" 1-1500  
Stock Code: GG90009018  
G33R001A/B, G33R009A/B

System Summary: Reactor Water Cleanup (RWCU) is designated by G33. This system is utilized to maintain reactor water quality.

Component Summary: G33R001A/B monitors the RWCU pump discharge pressure with the design function of providing non-safety related local indication .

G33R009A/B monitors the RWCU pump suction pressure with the design function of providing non-safety related local indication.

I. IDENTIFY SAFETY SIGNIFICANCE CLASSIFICATION PER GRADED QA PROGRAM

The G33 system has been determined to be LSS. Therefore, the component was classified as LSS. The component has no safety function per Section III below and falls into confirming LSS Classifications L1 (not modeled and not required in the PRA) and L3 ( less than 1/3 main branch) .

II. IDENTIFY SPECIFIC SAFETY FUNCTION(S) (PER GES-04)

Original Design Function - ASME Pressure Boundary - Safety related  
Local Indication - Non-safety related

III. IDENTIFY APPLICABLE REQUIREMENTS AND COMMITMENTS (PER GES-04)

Analysis revealed no concerns with EQ, Seismic, ASME, Containment Isolation, Separation Requirements. The pressure gauge is located in non-seismic piping which is designed to ANSI B31.1 piping. The instruments are isolated from the reactor coolant pressure boundary and are not on Seismic Category I piping. Therefore, the instruments have no pressure boundary function. The pressure gauge has no affect on other safety significant systems/components. The pressure gauge tap is 1/2 inch while the piping size is 4 inches. Therefore, this also falls into LSS confirming Category L3.

IV. DETERMINE PROCUREMENT REQUIREMENTS (PER GES-05)

Procure commercial grade. Reclassify as non-safety related.

GRADED QA APPROACH TO DETERMINATION  
OF LSS PROCUREMENT REQUIREMENTS  
EXAMPLE: Relay, DC Control Power Monitoring (74 Device)  
Agastat Relay - EGP  
Stock Code: GG853300001  
R20 74-09

System Summary: 480V LC/MCC is designated by R20. This system provides offsite AC power utilized during startup, normal operation and safe shutdown of the plant.

Component Summary: R20 74-09 picks up for breaker no. 15601 the common loss of control power annunciator for 480V ESF Div. 1 LCC/MCC incoming feeders DC control power loss. This control power monitoring relay feeds LCC 15BA6.

I. IDENTIFY SAFETY SIGNIFICANCE CLASSIFICATION PER GRADED QA PROGRAM

The R20 system has been determined to be SS. The relay was determined to be a component not modeled in the PSA and not required for the system function in the PSA. Therefore, component was classified as LSS (L2).

II. IDENTIFY SPECIFIC SAFETY FUNCTION(S) (PER GES-04)

The 74 relay is fed from a 1E circuit. Thus, the 74 relay was originally classified as safety related with the safety related function of maintaining class 1E circuit integrity. The relay is located in the 15601 bus. Therefore, the relay is classified as safety related.

III. IDENTIFY APPLICABLE REQUIREMENTS AND COMMITMENTS (PER GES-04)

Analysis determined the relay in the DC circuit has been fused on both sides of the 74 relay to provide class 1E circuit isolation. The contacts which pick up the common alarm are paralleled with other 74 relays which likewise have dual fuse protection. The paralleled contacts are all then fed through an isolator prior to connection to the Non-Q annunciator in the control room. The relay failure will not degrade the class 1E bus and prevent an SS component from performing its safety function. Therefore, the item is classified as LSS and procurement requirements may be re-evaluated for reducing quality assurance requirements.

#### IV. DETERMINE PROCUREMENT REQUIREMENTS (PER GES-05)

The relay can be procured commercial grade and receipt inspected for part number to ensure those LSS design characteristics signified by the model number/vendor catalog information are checked (i.e., voltage rating, contact current rating, etc.).

**NOTE:**

**This evaluation could generically apply to all DC 74 relays that have been double fuse protected on both sides of the relay, isolating them from the Class 1E power where no safety or safety significant functions exist.**

GRADED QA APPROACH TO DETERMINATION  
OF LSS PROCUREMENT REQUIREMENTS  
EXAMPLE: Actuator, Rx Head Vent to MSL "A"  
Limitorque SMB-000  
1B21F005

System Summary: Nuclear Boiler system is designated by B21 and is the nuclear steam supply system.

Component Summary: 1B21F005 actuator operates the valve which provides venting of non-condensable gases from the Rx Head to Main Steam Line "A" during startup.

I. IDENTIFY SAFETY SIGNIFICANCE CLASSIFICATION PER GRADED QA PROGRAM

The 1B21F005 valve operator is not modeled and not required to support an SS function. Therefore, it has been classified as L2 under the Graded QA Criteria

II. IDENTIFY SPECIFIC SAFETY FUNCTION(S) (PER GES-04)

The parent valve body is an ASME Class 1 pressure boundary but since the valve vents the Rx head to the Main Steam Line (inside the MSIV's), the position of the valve is not important post accident. The power supply to the motor operator is Non-Q.

- ASME Pressure Boundary for the valve
- No active safety function for the motor operator
- Passive safety function of structural integrity for valve and operator

III. IDENTIFY APPLICABLE REQUIREMENTS AND COMMITMENTS (PER GES-04)

Since the Rx Head Vent vents into the Main Steam Line, failure to operate the valve to the open or closed position is not important to safety as long as the pressure integrity of the valve is maintained. The operator is powered from non-Class 1E power and cannot degrade a Class 1E power source or affect any other safety related electrical function. Seismic design of the piping and valve body may be impacted by weight/dimension changes.

IV. DETERMINE PROCUREMENT REQUIREMENTS (PER GES-05)

- Procure actuator commercial grade
- Verify at receipt - actuator weight and dimensions to be within limits that would not affect seismic design



- Verify part number