



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

DEC 4 1995

Entergy Operations, Inc.
ATTN: C. R. Hutchinson, Vice President
Operations - Grand Gulf
P.O. Box 756
Port Gibson, Mississippi 39150

SUBJECT: GRAND GULF PERFORMANCE-BASED AUDITS MEETING

This refers to the meeting conducted in the Region IV office on November 16, 1995. At this meeting your staff described the actions and scope of activities undertaken to develop a process for identifying those activities that will require increased or decreased auditing because of identified performance weaknesses or strengths, respectively.

From the presentation we concluded that your staff had expended a significant amount of resources to develop a well thought out process that should apply your resources more appropriately to those items that have the greater safety significance. We appreciate the time your staff took to discuss, globally, these upcoming changes to your programs and processes.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter will be placed in the NRC's Public Document Room.

Should you have any questions concerning this matter, we will be pleased to discuss them with you.

Sincerely,

J. E. Dyer, Director
Division of Reactor Projects

Enclosures:

- 1. Attendance List
- 2. Licensee Presentation

cc w/enclosures:

Entergy Operations, Inc.
ATTN: H. W. Keiser, Executive Vice President
and Chief Operating Officer
P.O. Box 31995
Jackson, Mississippi 39286-1995

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PDR ADOCK 05000416
P PDR

Entergy Operations, Inc.

-2-

Wise, Carter, Child & Caraway
ATTN: R. B. McGehee, Esq.
P.O. Box 651
Jackson, Mississippi 39205

Winston & Strawn
ATTN: Nicholas S. Reynolds, Esq.
1400 L Street, N.W. - 12th Floor
Washington, D.C. 20005-3502

Mississippi Department of Natural
Resources
ATTN: Sam Mabry, Director
Division of Solid Waste Management
P.O. Box 10385
Jackson, Mississippi 39209

Claiborne County Board of Supervisors
ATTN: President
Port Gibson, Mississippi 39150

Bechtel Power Corporation
ATTN: Mr. K. G. Hess
P.O. Box 2166
Houston, Texas 77252-2166

Bechtel Power Corporation
ATTN: N. G. Chapman, Manager
9801 Washington Boulevard
Gaithersburg, Maryland 20878

Entergy Operations, Inc.
ATTN: D. L. Pace, Grand Gulf
Nuclear Station General Manager
P.O. Box 756
Port Gibson, Mississippi 39150

The Honorable William J. Guste, Jr.
Attorney General
Department of Justice
State of Louisiana
P.O. Box 94005
Baton Rouge, Louisiana 70804-9005

Office of the Governor
State of Mississippi
Jackson, Mississippi 39201

Entergy Operations, Inc.

-3-

Mike Moore, Attorney General
Frank Spencer, Asst. Attorney General
State of Mississippi
P.O. Box 22947
Jackson, Mississippi 39225

State Board of Health
ATTN: Dr. F. E. Thompson, Jr.
State Health Officer
P.O. Box 1700
Jackson, Mississippi 39205

Entergy Operations, Inc.
ATTN: J. G. Dewease, Vice President
Operations
P.O. Box 31995
Jackson, Mississippi 39286-1995

Entergy Operations, Inc.
ATTN: Michael J. Meisner, Director
Nuclear Safety
and Regulatory Affairs
P.O. Box 756
Port Gibson, Mississippi 39150

bcc to DMB (IE01)

bcc distrib. by RIV:
L. J. Callan
Branch Chief (DRP/D)
MIS System
Project Engineer (DRP/D)
PAO

Resident Inspector
Leah Tremper (OC/LFDCB, MS: TWFN 9E10)
RIV File
Branch Chief (DRP/TSS)
RSLO

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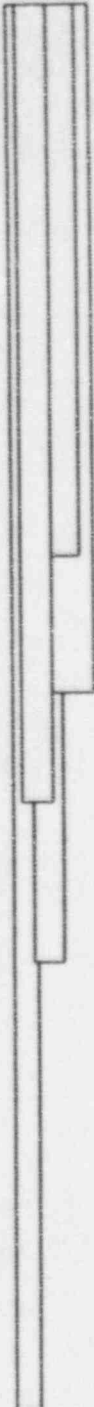
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MEETING: IMPLEMENTATION OF GRADED QA BY GRAND GULFDATE: November 16, 1995ATTENDANCE LIST
(PLEASE PRINT CLEARLY)


NAME	ORGANIZATION	POSITION TITLE
P. HARRELL	REGION IV - NRC	CHIEF, BRANCH D
MIKE LARSON	GRAND GULF, ENERGY	Senior Lic. Specialist
Paul O'Connor	NRC/NRR/DRPW/P041	Project Manager
BRUCE BOGER	NRC/NRR/DRCH	Director, DRCH
THOMAS P. GUYSON	NRC RIV	Director, DRB.
Curtley Hayes	EOI Grand Gulf	Director, Quality
JIM REAVES	EOI GRAND GULF	TECHNICAL COORDINATOR, QUALITY
MIKE MEISNER	EOI Grand Gulf	Director Nuclear Safety & Regulatory Affairs
Sally C. Roberts	EOI - Corporate (Technical)	Director Nuclear Safety & Licensing
KENNETH HUGHES	EOI - Corporate	Director Ops Support
J.J. Petrosino	NRC/NRR/DRCH	QA Specialist
W.P. ANG	NRC RIV	Group Leader, ENGR BR.
JIM LYNCH	SEA INC ^{CONTRACT SUPPORT} OF NRC QA	VICE PRESIDENT
Gregory A. Pick	R IV - NRC	Project Engr - Branch D
DOUGLAS DAVIS	TU - Comanche Peak	Nuclear Overview MGR
DAVE McAFFEE	TU - Comanche Peak	NOD Prog. MGR
John Fowler	EOI - River Bend	Quality Supv.
Rick J. King	EOI - AND	Supv., Licensing
A. CARTER ROGERS	ARIZ PUBLIC SERV CO, PALO VERDE	TECH ASST, Nuc REG AFFAIRS
STEVE ROSEN	HL&P/STP -	DIRECTOR, INDUSTRY RELATIONS
Mark McBurnett	HL&P/STP	Licensing Manager
Dan Pace	ENERGY	Gen Mgr
Bob Gramm	NRC/NRR/DRCH/QA	QA Section Chief
JU:ANNE BLACK	NRC/NRR/DRCH/HQMB	BRANCH CHIEF



NRC Region IV/Entergy Operations Meeting

Implementation of Graded QA

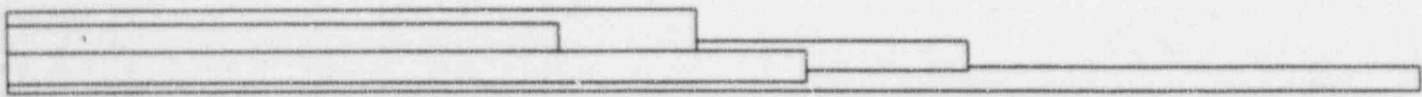
November 16, 1995
Mike Meisner
Director, Nuclear Safety & Regulatory Affairs
Entergy Operations
Grand Gulf Nuclear Station



Implementation of Graded QA at Entergy Operations

- ◆ Overview
- ◆ Rationale for proceeding
- ◆ Progress to-date
 - Overview
 - System level evaluation
 - Component level evaluation
 - QA criteria
- ◆ Graded QA and non-Appendix B requirements
- ◆ Role of the expert panel
- ◆ NRC participation

Overview

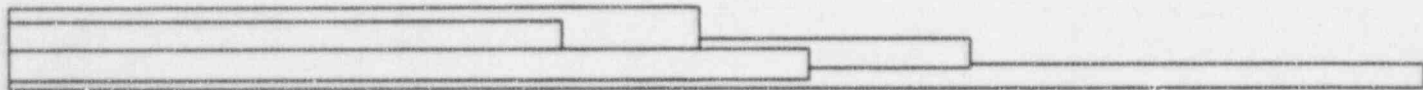





Overview

- ◆ **Entergy Operations is implementing a Graded QA program**
- ◆ **Grand Gulf has the lead**
- ◆ **Extensive development work completed through EPRI project**
- ◆ **Active expert panel and implementation teams**
- ◆ **NRC requested to actively participate in completion of development**
- ◆ **Graded procurement to be implemented by year end**
- ◆ **Expand later to other Grand Gulf processes and EOI sites**

Rationale for Proceeding

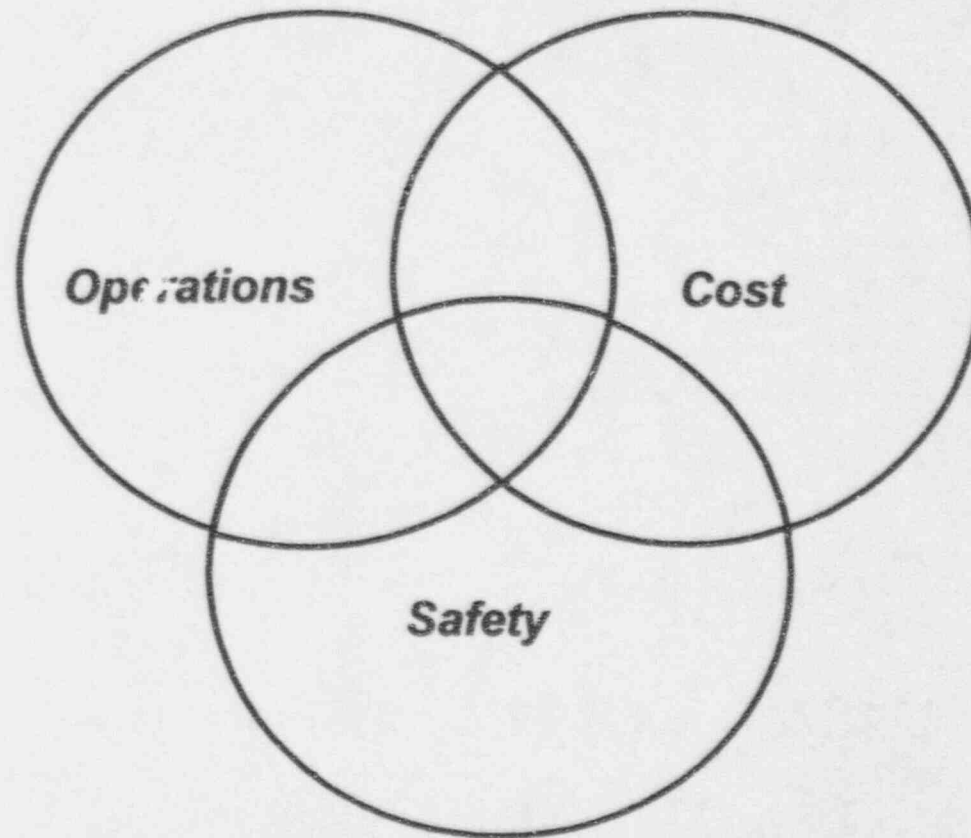




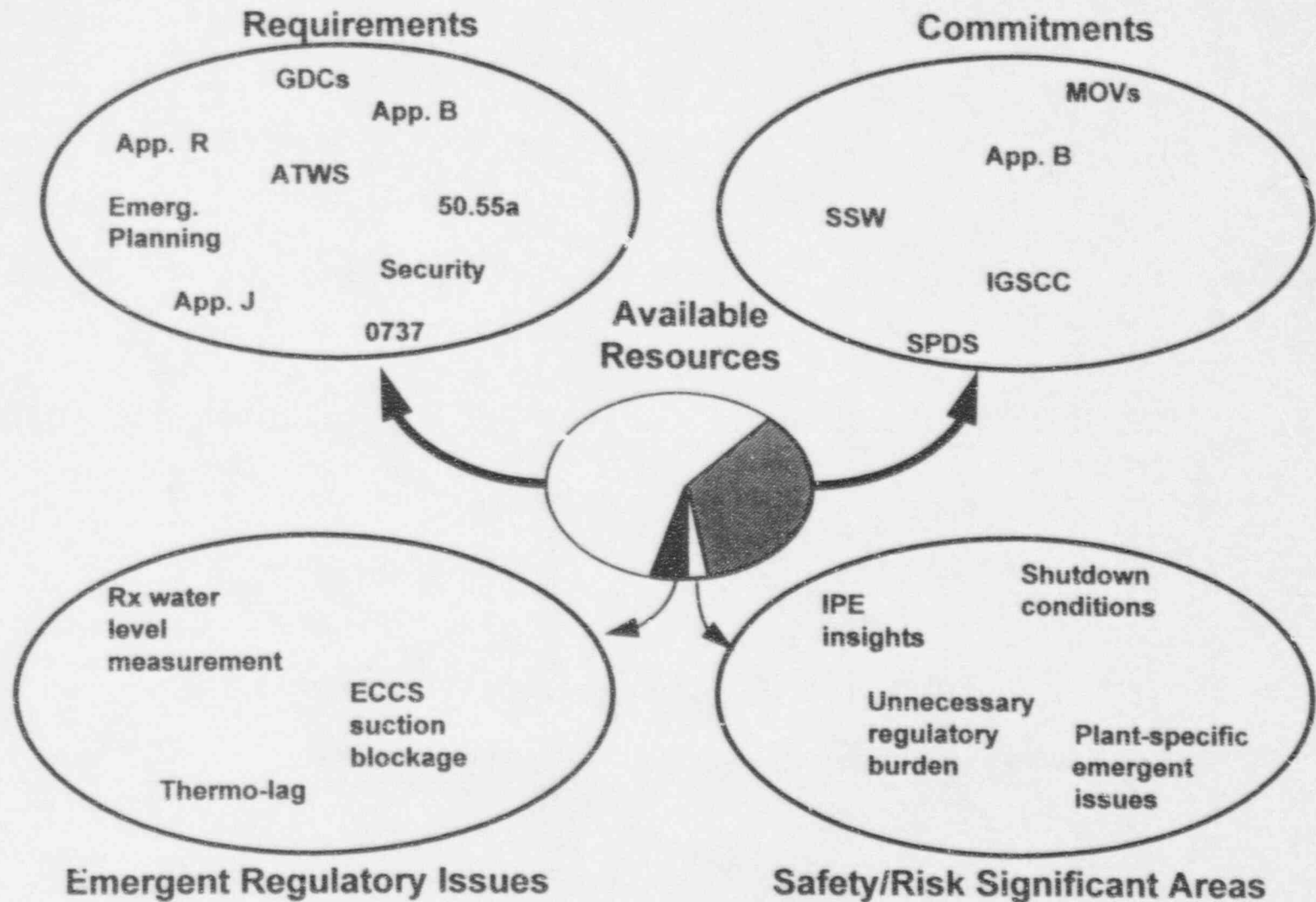
Rationale for Proceeding

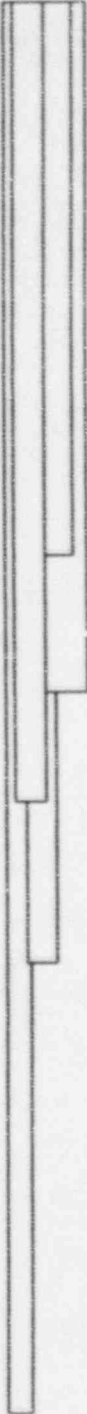
***Graded QA is a natural extension of the
Energy Operations philosophy and strategy
for achieving and maintaining nuclear
excellence***

Balanced Approach to Nuclear Performance



Resource Allocation in a Regulated Environment



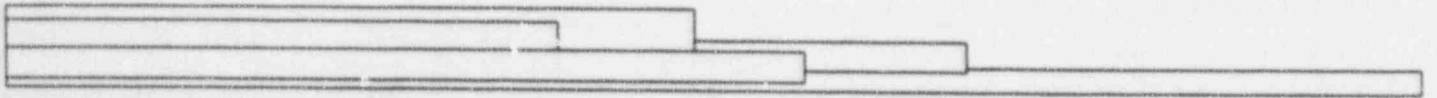


Why Graded QA Is Attractive

- ◆ **Clarifies what is important to safety through combining probabilistic and deterministic insights - essentially replaces the “safety-related”/“non-safety related” framework**
- ◆ **Is a significant tool to focus individual attention on what is important to safety in virtually every site function**
- ◆ **Can be used to eliminate excess work which does not contribute to safety**
- ◆ **Is flexible enough to apply on a selective basis to structures, systems, components and processes**

Progress To-Date

- Overview



Basic Concepts

- ◆ Appendix B

“The quality assurance program shall provide control over the activities affecting the quality of ... structures, systems and components, to an extent consistent with their importance to safety”

- ◆ New terminology

- Based on a blend of deterministic and probabilistic criteria, the importance to safety of individual structures, systems and components is determined, and categorized as either:
 - Safety significant, or
 - Low-safety significant
- “Safety related” and “non-safety related” SSCs may be in either category



Basic Concepts

- ◆ **Q-list is revised to incorporate the re-categorized SSCs**
- ◆ **Application of Appendix B criteria proportional to importance to safety**
 - **Safety significant - full Appendix B**
 - **Low safety significant - reduced Appendix B**
 - **“Safety related” and “non-safety related” SSCs may be in either category**

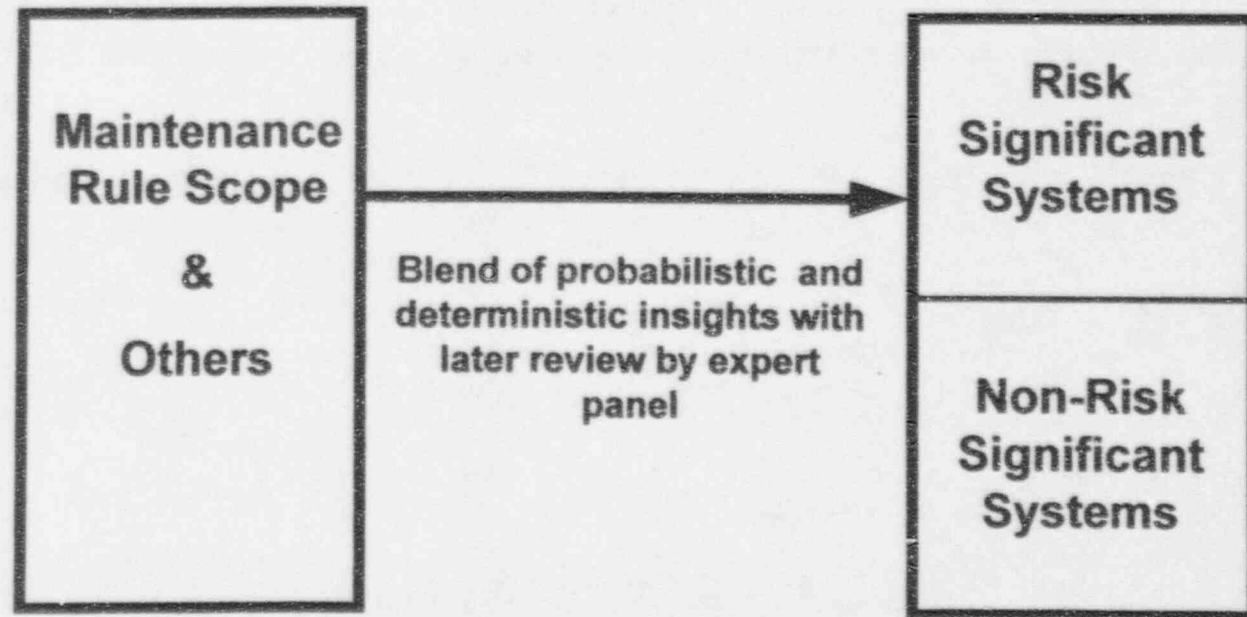


Overview of the Q-List Revision Process

- ◆ **System level evaluation**
 - Identify safety significant systems
 - Similar to but more comprehensive than the Maintenance Rule approach for risk significant systems
- ◆ **Component level evaluation**
 - Applied to safety significant systems
 - Identify safety significant components
- ◆ **Initial emphasis has been on deterministic rather than probabilistic criteria**

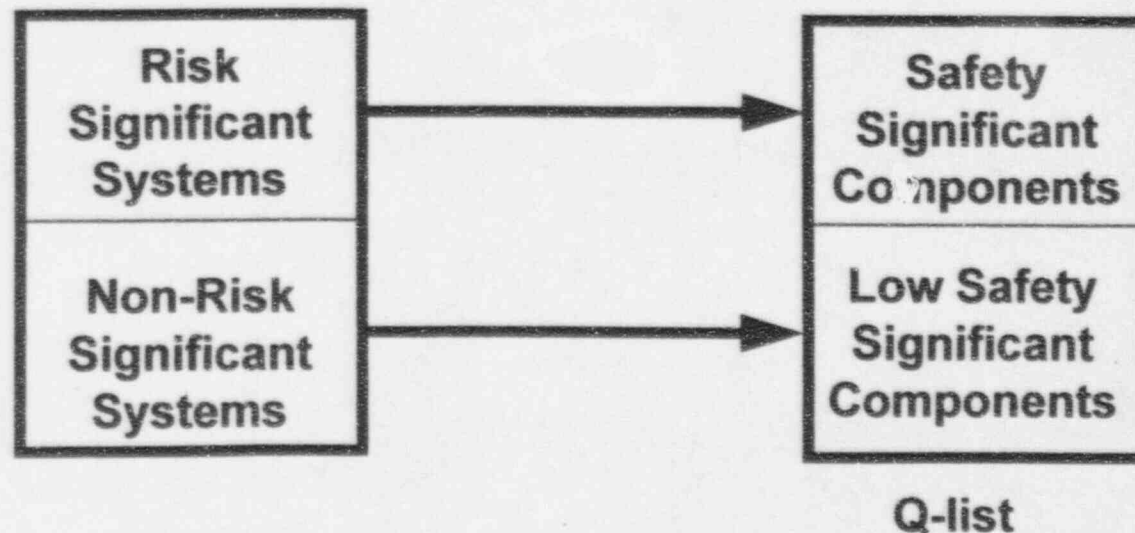
Restructuring the Q-List

- ◆ Start with Maintenance Rule scope and potential risk contributors outside the Maintenance Rule scope to identify risk-significant systems



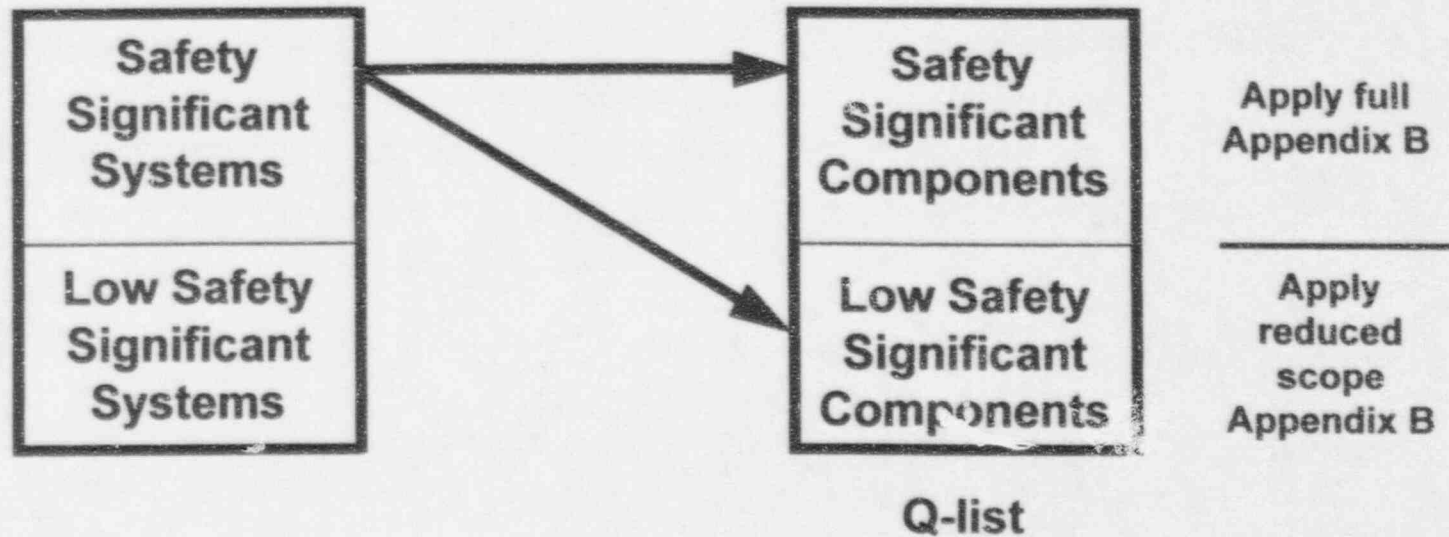
Restructuring the Q-List

- ◆ Assign all components in risk-significant systems to the safety-significant category of Q-list
- ◆ Assign all components in non-risk significant systems to the low-safety-significant category of Q-list



Restructuring the Q-List

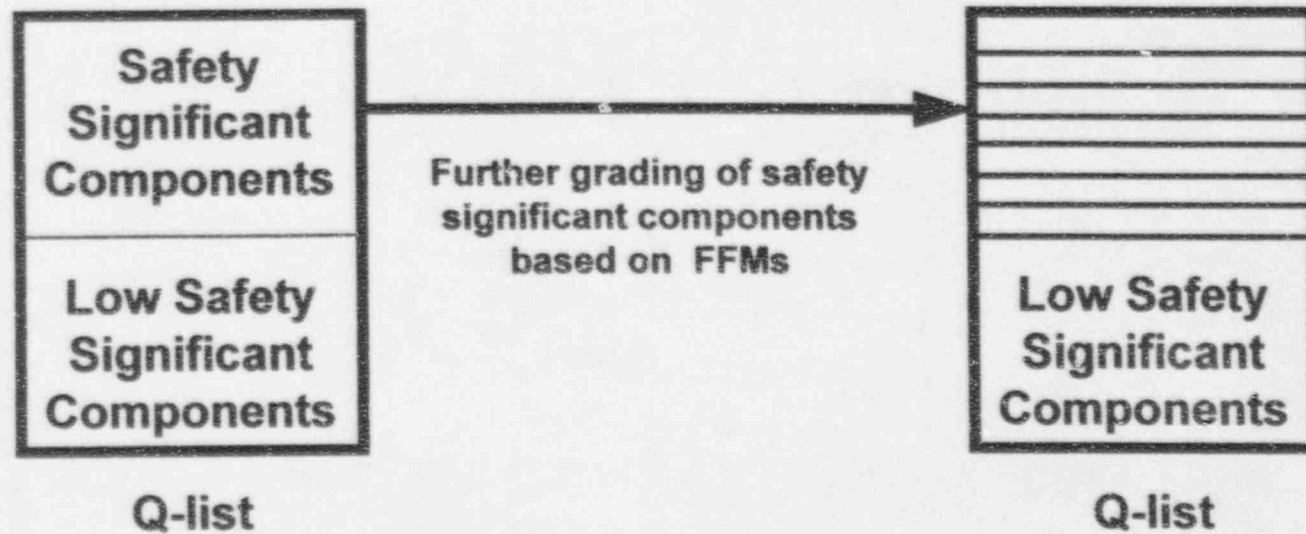
- ◆ Review safety-significant systems and identify components that are important to safety
- ◆ Assign components that are not important to safety to low-safety-significant category



Restructuring the Q-List

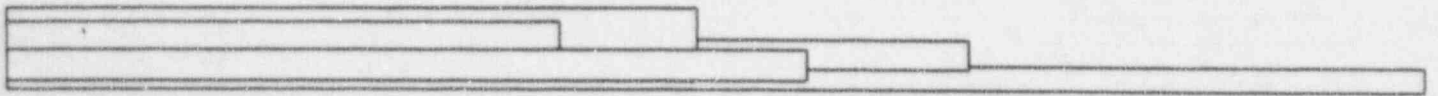
- ◆ **Future Option**


- Identify functional failure modes of safety significant components
- Further grade QA measures



Progress To-Date

- System level evaluation

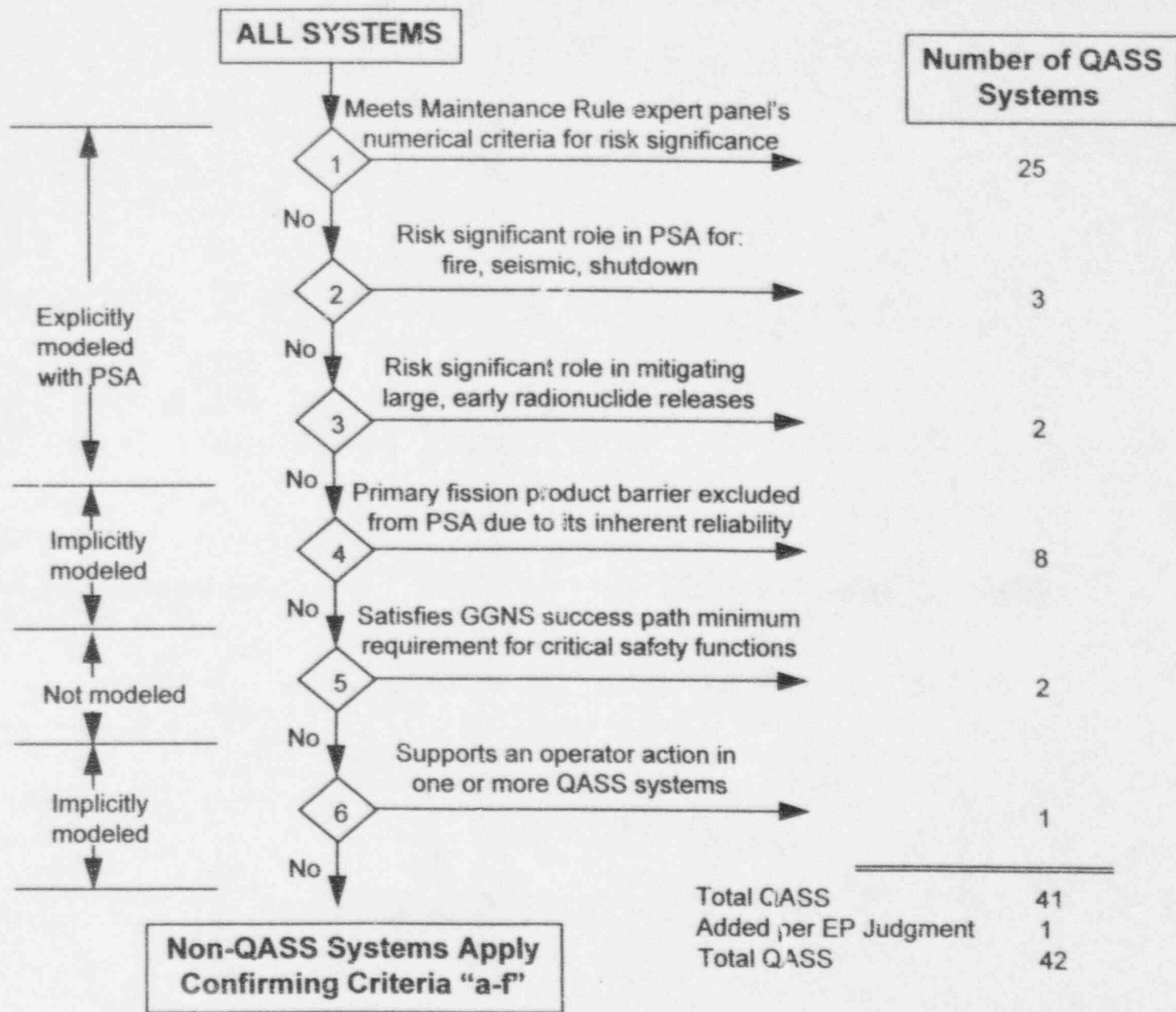




System Level Evaluation

- ◆ **Included all plant systems and significant civil structures**
- ◆ **Maintenance Rule (MR) evaluation used to “include” rather than “exclude”**
 - **MR risk significant systems were retained as safety significant systems**
 - **MR non-risk significant systems were further evaluated**

Graded QA System Criteria¹



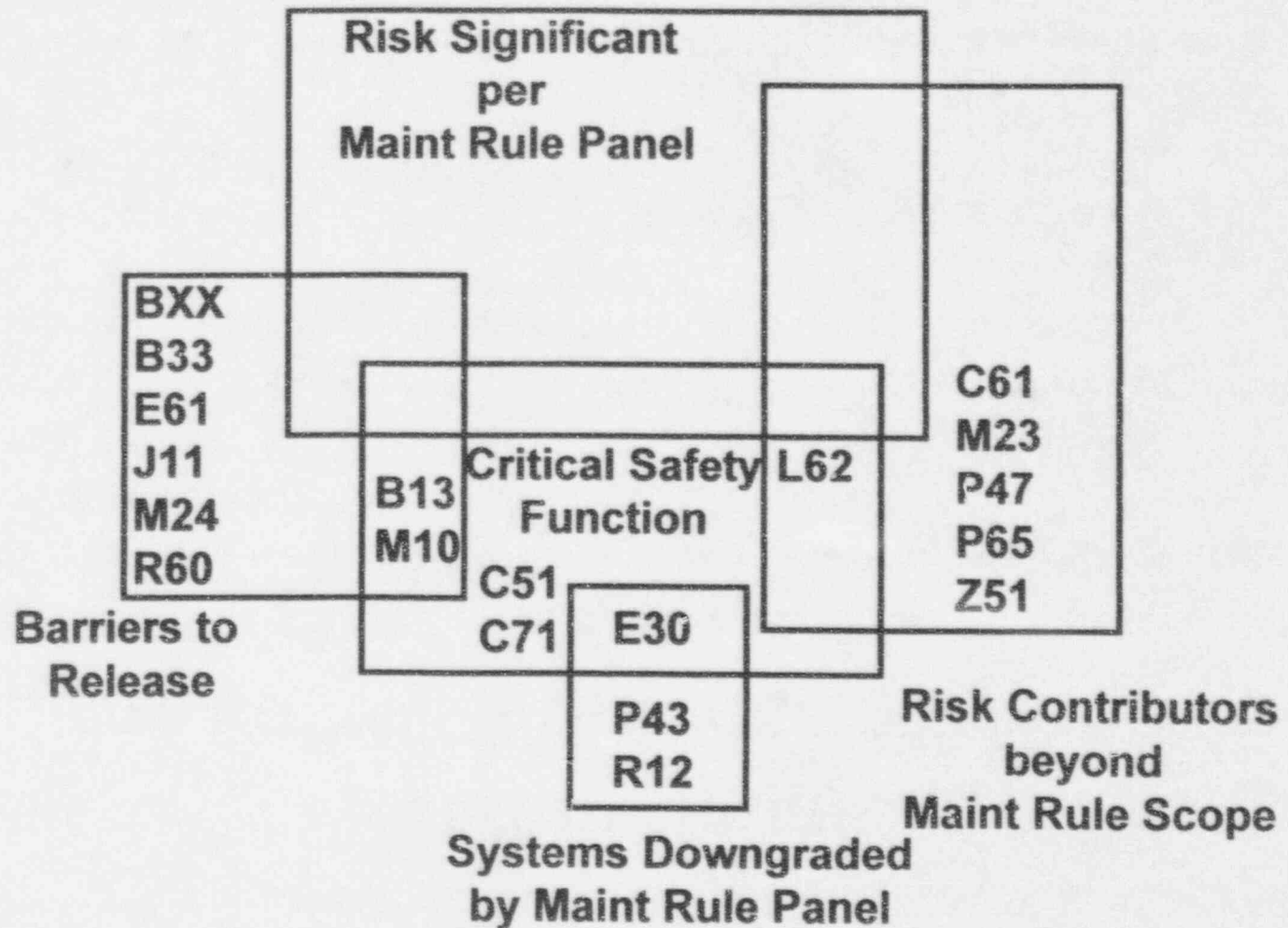
¹The numbers for the criteria are consistent with: (a) Grand Gulf's system summary table, published separately.



System Level Low Safety Significant Criteria

- ◆ **Not functionally important to core damage risk or the risk of large, early radionuclide releases**
- ◆ **Modeled in the IPE, but not meeting MR screening criteria or expert panel's test for safety significance**
- ◆ **A feature that has a potential in minimizing risk, but whose probability of failure is judged to be very low**
- ◆ **Not modeled in the PSA because the functional relationship with plant risk is too weak to quantify**
- ◆ **Highly reliable structure/system with other requirements besides QA that are sufficient to assure reliability during accidents**
- ◆ **Not modeled in any GGNS risk study and non-safety related**

The "Footprint" for System Significance Evaluation



System Level Evaluation Preliminary Results

◆	Number of systems		
-	Safety significant		42
•	safety related	=	31
•	containment isolation	=	1 (MXX)
•	RCS pressure bound/cnmt pent pipe	=	1 (Bxx)
•	non-safety related	=	9 (R12) - 6.9 kv xfrmrs
-	Low safety significant		146
•	safety related	=	55
•	non-safety related	=	83
-	Total systems		188
◆	Safety-related components (system level-estimated)		
	Safety significant		14,941
-	Low safety significant		3,905
-	Total components (SR)		18,846

Grand Gulf System/Structure Summary

System	System Description	System Includes Safety Related Components	Modeled in the PRA	MR Risk Significant	Number of Safety Related Components	Total Components	SS Criterion 1	SS Criterion 2	SS Criterion 3	SS Criterion 4	SS Criterion 5	SS Criterion 6	Other SS	LSS
B33	Reactor Recirculation	Y	Y	N	436	1445			X					
B35	Low Frequency Recirculation System		N	N										X
Blex	Reactor Coolant Pressure Boundary and Containment Penetration Piping	Y	N	N			X - Coolant Injection		X					
C11	CRD System	Y	Y	Y	3629	5316				X				X
C21	Main Steam Bypass and Pressure Control System		N	N										X
C22	Redundant Reactivity Control System		N	N										X
C34	Feeder Control	Y	N	N	15	131								X
C41	Standby Liquid Control	Y	Y	Y	110	144								X
C51	Neutron Monitoring	Y	N	N	279	369				X				X
C52	Excore Neutron Monitoring System		N	N										X
C61	Remote Shutdown	Y	N	N	219	219		X - per Fire IPEEE						
C71	Reactor Protection Sys	Y	Y	N	322	365				X				
C82	Plant Annunciators	Y (x)	N	N	6	155								X
C83	Plant Security	N	N	N		404								X
C84	Meteorological Monitoring	Y (y)	N	N	1	161								X
C85	Seismic Monitoring	Y (x)	N	N	1	43								X
C86	Vibration Monitoring	N	N	N		8								X
C87	Loose Parts Monitoring	N	N	N		46								X
C88	Transient Test System	Y (x)	N	N	21	106								X
C91	Computer	N	N	N		5903								X
C92	TSO Computer	N	N	N										X
C93	Emergency Response Facilities	N	N	N		55								X
C94	Tandem Computer	N	N	N										X
C95	Microwave System	N	N	N		1								X
C97	Misc I & C	N	N	N		14								X
D10	Radiation Zones Map	N	N	N										X
D11	Radiation Telemetry	N	N	N										X
D17	Process Rad Monitoring	Y	N	N	54	1380								X
D21	Area Rad Monitoring	Y	N	N	14	203								X
D23	Drywell Monitoring	Y (x)	Y	N	23	54								X

Grand Gulf System/Structure Summary

System	System Description	System Includes Safety Related Components	Modeled in the PRA	MR Risk Significant	Number of Safety Related Components	Total Components	SS Criterion 1	SS Criterion 2	SS Criterion 3	SS Criterion 4	SS Criterion 5	SS Criterion 6	Other	LSS
E12	LPCI, SDC, & ADHR	Y	Y	Y	1244	1364	X	X - ADHR (shutdown)	X - ECCS Injection					
E21	LPCS	Y	Y	Y	182	197	X		X - ECCS Injection					
E22	HPCS	Y	Y	Y	402	444	X		X - ECCS Injection					
E30	Suppression Pool Make-up		Y	N(*)	147	153	X							
E31	Leak Detection System	Y	Y	N	429	758								X
E32	MSIV Leakage control	Y	N	N	238	263								X
E38	Feedwater Leakage Control	Y	N	N	36	40								X
E51	RCC	Y	Y	Y	534	534	X		X - DW vacuum breakers				X - H2 igniters	
E61	Combustible Gas Control	Y	Y	N	763	865								
F11	Fuel Serv Equip	Y (Y)	N	N	10	58								X
F12	Servicing Aids	N	N	N	10	10								X
F13	RPV Serv Equip	Y	N	N	12	23								X
F14	In-Vessel Serv Equip	Y	N	N	1	14								X
F15	Refueling Equipment	Y	N	N	10	50								X
F16	Storage Equipment	Y	N	N	6	11								X
F17	Under RPV Serv Equip	N	N	N	9	9								X
F24	GENED Equipment	N	N	N		3								X
F41	Startup Equipment	N	N	N		3543								X
G17	Liquid Radwaste	N	N	N		598								X
G18	Solid Radwaste	N	N	N										X
G19	Resin Cleaner System	N	N	N										X
G33	RWCU	Y	Y	N	225	548								X
G36	RWCU F/D	Y	N	N	30	523								X
G41	FPC & Cleanup	Y	N	N	372	452								X
G46	FPC F/D	Y	N	N	15	443								X
G50	CRD Maintenance	N	N	N		71								X
H13	Control Room Panels	Y	N	N	62	163								X
H22	Local Inst Racks	Y	N	N	71	470								X
J11	Fuel	Y	N	N	2	2				X				
J12	Fuel Warranty Service	N	N	N										X
K11	Subcontractor Charges	N	N	N										X
K21	In service inspection	N	N	N										X

Grand Gulf System/Structure Summary

System	System Description	System Includes Safety Related Components	Modeled in the PRA	MR Risk Significant	Number of Safety Related Components	Total Components	SS Criterion 1	SS Criterion 2	SS Criterion 3	SS Criterion 4	SS Criterion 5	SS Criterion 6	Other SS	LSS
L11	125v Batteries	Y	Y	Y	2	10	X							X
L20	24v Batt. Swgr & Dist	Y (Y)	N		4	54								
L21	125v Swgr & Dist	Y	Y	Y	84	297	X							X
L22	250v Swgr & Dist	N	N			3								X
L50	24v Batt Chargers	N	N			12								X
L51	125v Battery Chargers	Y	Y	N	39	96								X
L52	250V Motors	N	N	N										X
L82	Inverters	Y	N	N	56	126					X			
M10	Containment	N	N	N		11			X					X
M11	Excavation	N	N	N										X
M20	Stairs and Miscellaneous Platforms	N	N	N										X
M21	Substructure	N	N	N										X
M22	Superstructure	N	N	N										X
M23	Hatches & Locks	Y	N	N	37	59			X					X
M24	DWIS/Upper Cont Pool	N	N	N		8			X - Drywell structure					
M25	Reactor - Pedestal and Shielding	N	N	N										X
M26	Pipe Restraints	N	N	N										X
M27	Small Pipe-Whip Restraints	N	N	N										X
M30	Jet Impingement Shields Designed by Light Structures Group	N	N	N										X
M31	Misc Cranes, Hoists & Elevators	Y	N	N	4	17								X
M41	Containment Cooling Sys	Y (Y)	Y	N	89	408								X
M46	Containment Penetrations	N	N	N										X
M51	Drywell Cooling	Y	N	N	58	205								X
M56	Drywell Penetrations		N	N										X
M61	Cont Leak Rate Test	Y (Y)	N	N	12	124								X
M62	Quenches Test	Y 7	N	N	2	17								X

Grand Gulf System/Structure Summary

System	System Description	System Includes Safety Related Components	Modelled in the PRA	MR Risk Significant	Number of Safety Related Components	Total Components	SS Criterion 1	SS Criterion 2	SS Criterion 3	SS Criterion 4	SS Criterion 5	Other SS	LSS
M71	Containment & DW/IRC	Y	Y	N	426	486							X
M72	Isolation Valve Status Panel	Y?	N		2	8							X
M81	Enclosure Building	Y	Y	N									X
M81	Raceway		N	N									X
M82	Lighting, Communication & Fire Alarm	N	N	N		57							X
M83	Grounding	Y	N	N									X
M83	Containment Isolation (z)	Y	Y	Y					X				
N11	Main & Reheat Steam	N	Y	N		912							X
N12	Auxiliary Steam Sys	N	N			29							X
N13	Turbine Cycle Heat Balance	N	N	N									X
N19	Condensate	N	Y	N		1242							X
N21	Feedwater	N	Y	N		1068							X
N22	Condensate Cleanup	Y (x)	N	N	1	1750							X
N23	Heater, Vents & Drains	N	N	N		1197							X
N30	Turbine & Auxiliaries	N	N	N		186							X
N31	Turbine	N	N	N		123							X
N32	Turbine Control	N	N	N		1055							X
N33	Main & RGP Turbine Seal Steam and Drain	N	N			612							X
N34	Lube Oil	N	N	N		584							X
N35	MSR Vents & Drains	N	N	N		587							X
N36	Extraction Steam	N	N	N		139							X
N37	Turbine Bypass	N	N	N		44							X
N37	Turning Gear System and Turbine Supervisory	N	N	N									X
N38	Generator Auxiliaries	N	N	N		8							X
N40	Generator	N	N	N		369							X
N42	Seal Oil	N	N	N		226							X
N43	Generator Cooling	N	N	N		566							X
N44	H2CO2 Storage	N	N			236							X
N45	Donkey Boiler System	N	N	N									X
N51	Gen Excitation	N	N	N		49							X
N62	Condenser Air Removal	N	N	N		336							X
N64	OR Gas (Low Temp)	N	N	N		1163							X
N65	Off Gas Refrigeration	N	N	N		173							X

Grand Gulf System/Structure Summary

System	System Description	System Includes Safety Related Components	Modeled in the PRA	MR Risk Significant	Number of Safety Related Components	Total Components	SS Criterion 1	SS Criterion 2	SS Criterion 3	SS Criterion 4	SS Criterion 5	Other SS	LSS
N71	Circulating Water	N	Y	N		1003							X
N72	Chlorination	N	N			30							X
P11	Condensate & Refueling Water Storage & Transfer	Y	Y	Y	99	378	X						
P21	Makeup Water Treatment	Y (x)	N	N	25	1059							X
P24	Raw Water Treatment System	N	N	N									X
F33	Process Sampling	Y (x)	N		4	781							X
P41	Standby Service Water	Y	Y	Y	1178	1311	X						
P42	CCW	Y	Y	Y	164	492	X						
P43	Turb Bldg Cooling Water	Y	Y	N(*)	1	865	X						
P44	Plant Service Water	Y	Y	Y	116	778	X	X - ADHR Support (Shutdown)					
P45	Floor & Equip Drains - Embedded	Y (x) (y)	N	N	141	1481							X
P46	Sanitary Drainage Systems	N	N	N									X
P47	Service Water Radial Well	N	Y	N		681		X - ADHR Support (Shutdown)					
P48	Floor & Equip Drains, Suspended	N	N	N		5							X
P50	Roof Drainage Systems	N	N	N									X
P52	Service Air	Y (x) (y)	Y	N	52	864							X
P53	Instrument Air	Y	Y	Y	87	1983	X	X - ADHR Support (Shutdown)					
P60	SP Cooling Cleanup	Y	N	N	65	136							X
P61	HVAC Service Water System	N	N	N									X
P62	Environ Monitoring System	N	N	N									X
P64	Fire Protection	Y	Y	Y	40	2201	X	X - per Fire IPEEE					
P65	Fire Detection	N	N	N		800		X - per Fire IPEEE					
P66	Domestic Water	Y (x)	N	N	17	518							X
P68	Plant Heating System	N	N	N									X

Grand Gulf System/Structure Summary

System	System Description	System Includes Safety Related Components	Modified in the PRA	MR Risk Significant	Number of Safety Related Components	Total Components	SS Criterion 1	SS Criterion 2	SS Criterion 3	SS Criterion 4	SS Criterion 5	SS Criterion 6	Other SS	LSS
P71	Plant Chilled Water	Y (H)	Y	N	102	1413								X
P72	Drywell Chilled Water	Y (H)	N	N	55	489								X
P75	Standby Diesel	Y	Y	Y	856	1307	X							
P81	HPCS Diesel	Y	Y	Y	462	570	X							
R01	Electrical Internal Control Documents	N	N	N										X
R10	480V Load Center Transformers		N	N										X
R11	4 16kv xformers	N	Y			194								X
R12	6 9 kv xformers	N	Y	N(*)		52	X							X
R13	13.8 kv boiler Transformers	N	N	N		44								X
R14	Main Stepup Transformers	N	N	N		98								X
R15	34.5 kv Transformers	N	N	N		36								X
R18	120/280 v dist & lighting xformers	Y Why?	N ??	N	6	79								X
R20	480v Load & MCCs	Y	Y	Y	529	1408	X							
R21	4 16 kv Swgr & Load Shedding & Sequence Panels	Y	Y	Y	267	615	X							
R22	6 9 kv Swgr	N	N	N		104								X
R23	13.8 kv Swgr	N	N	N		17								X
R24	22 kv Gen Iso Bus	N	N	N		13								X
R25	34.5 kv Swgr	N	N	N		147								X
R26	34.5 kv Bus & Misc Equip	N	N	N	4	4								X
R27	500 kv Ckt Brks	Y ?	Y	Y	6	31	X							
R28	120/280 Dist & Lighting Panels	Y	Y	N	114	314								X
R29	Med Voltage Termination Equip	N	N	N	1	1								X
R31	Specialty Cable	Y	N	N										X
R32	Instrument and Computer Cable	Y	N	N										X
R33	Coaxial and Triaxial Cable	Y	N	N										X

Grand Gulf System/Structure Summary

System	System Description	System Includes Safety Related Components	Modsted in the PPA	MR Risk Significant	Number of Safety Related Components	Total Components	SS Criterion 1	SS Criterion 2	SS Criterion 3	SS Criterion 4	SS Criterion 5	SS Criterion 6	Other SS	LSS
R34	Thermocouple Extension Cable 600 V Multiconductor Control Cable	Y	N	N										X
R35		Y	N	N										X
R41	2.4 kv Grd Resistor for 4.16 kv	N	N			18								X
R42	4.0KV Grounding Resistors for 6.9KV System	N	N	N										X
R44	22KV Grounding Resistors and Transformers	N	N	N										X
R45	4.16KV Grounding Resistors for 34.5KV Buses 11R and 21R	N	N	N										X
R50	460V Motors	N	N	N										X
R51	4.0KV Motors	N	N	N										X
R52	6.9KV Motors	N	N	N										X
R53	13.2KV Boiler Equipment	N	N	N										X
R58	Lighting Fixtures	N	N	N										X
R60	Penetrations	Y	N	N	49	151			X					X
R61	Public Address & Intercommunication	N	N	N		151								X
R62	Cathodic Protection	N	N	N		14								X
R63	Elec Heat Tracing	N	N	N		503								X
R64	Terminal Boxes	N	N	N										X
R65	Misc Elec Equip	N	N	N		26								X
R66	Site Telephone and Fiberoptics System	N	N	N										X
R81	Runways	N	N	N										X
R93	Grounding Cable	N	N	N										X
S11	Arrangements	N	N	N										X
S22	Structure Details	N	N	N										X
S91	Raceway	N	N	N										X
S92	Lighting, Communications, and Fire Alarm	N	N	N										X
S93	Grounding	N	N	N										X
T10	Auxiliary Bldg	Y	N	N	27	106								X
T11	Excavation	N	N	N										X
T20	Stairs and Miscellaneous Platforms	N	N	N										X
T21	Substructure	N	N	N										X
T22	Superstructure	N	N	N										X
T23	BOJ Pipe Whip Restraints	N	N	N										X
T26	Pipe Restraints	N	N	N										X
T27	Small Pipe-whip Restraints	N	N	N										X

Grand Gulf System/Structure Summary

System	System Description	System Includes Safety Related Components	Modified in the PRA	MR Risk Significant	Number of Safety Related Components	Total Components	SS Criterion 1	SS Criterion 2	SS Criterion 3	SS Criterion 4	SS Criterion 5	SS Criterion 6	Other	LSS
T29	Door Modifications	Y	N	N	7	51								X
T31	Cranes, Hoists & Elevators	Y	N	N	15	184								X
T41	Aux Bldg Ventilation	Y (X)	Y	N	52	294								X
T42	Fuel Handling Area Ventil	Y	N	N	62	92								X
T46	ESF Elec Swgr Room Cooling	Y	Y	N	405	454	X							X
T48	Standby Gas Treatment	Y	Y	N	46	60								X
T51	Emerg Pump Room Ventilation	Y	Y	Y	27	90								X
T81	Racway		N	N										X
T92	Lighting, Communication & Fire Alarms (Aux Bldg)	Y	N											X
T93	Grounding		N	N										X
U10	Turb Bldg	N	N			111								X
U11	Excavation	N	N	N										X
U20	Platforms	N	N	N										X
U21	Substructure	N	N	N										X
U22	Superstructure	N	N	N										X
U24	Turbine Pedestal	N	N	N										X
U26	Pipe Restraints	N	N	N										X
U31	Cranes, Hoists & Elevators	N	N	N	1	61								X
U41	Turb Bldg Ventilation	N	N	N		568								X
U91	Racway		N	N										X
U92	Lighting, Communication & Fire Alarms (Turb Bldg)	Y	N	N	4	82								X
U93	Grounding		N	N										X
V10	Radiation	N	N			135								X
V11	Excavation	N	N	N										X
V20	Stairs and Miscellaneous	N	N	N										X
V21	Platforms	N	N	N										X
V22	Radiation Substructure	Y	N	N										X
V26	Radiation Superstructure	Y	N	N										X
V31	Pipe Restraints	N	N	N										X
V41	Cranes, Hoists & Elevators	N	N	N		15								X
V42	Radiation Bldg Ventilation	N	N	N		203								X
V91	Radiation Vacuum to Hot Lab	N	N	N		9								X
V91	Racway		N	N										X

Grand Gulf System/Structure Summary

System	System Description	System Includes Safety Related Components	Modeled in the PRA	MR Risk Significant	Number of Safety Related Components	Total Components	SS Criterion 1	SS Criterion 2	SS Criterion 3	SS Criterion 4	SS Criterion 5	SS Criterion 6	Other SS	LSS
V92	Lighting, Communication & Fire Alarm (waste)	N	N	N		37								X
V93	Grounding	N	N	N										X
W20	Cooling Tower Structure	N	N	N										X
W21	Excavations	N	N	N										X
W22	Substructure	N	N	N										X
W23	Superstructure	N	N	N										X
W24	Screens, Trash Racks, and Rakes	N	N	N										X
W25	Underground Piping	N	N	N										X
W31	Cranes, Hoists and Elevators	N	N	N										X
W60	Circulating Water Pumphouse	N	N	N										X
W61	Excavation	N	N	N										X
W62	Substructure	N	N	N										X
W63	Superstructure	N	N	N										X
W67	Circulating Water Pumphouse Ventilation System	N	N	N										X
W69	Raceway	N	N	N										X
W82	Lighting and Communications	N	N	N										X
W93	Grounding	N	N	N										X
X10	Guard, Admin and Shop Bldgs	N	N	N		3								X
X11	Excavation	N	N	N										X
X12	Substructure	N	N	N										X
X13	Superstructure	N	N	N										X
X17	Administrative Building HVAC System	N	N	N										X
X27	Guardhouse HVAC	N	N	N										X
X29	Cranes, Hoists & Elevators	N	N	N		8								X
X30	Warehouse	N	N	N										X
X31	Excavation	N	N	N										X
X32	Substructure	N	N	N										X
X33	Superstructure	N	N	N										X
X37	Warehouse Ventilation	N	N	N		4								X
X38	EOF Kitchen Equipment	N	N	N										X
X39	EOF Communications Equipment	N	N	N		5								X
X40	EOF Ventil Rad Monitors	N	N	N										X
X41	EOF Area Rad Monitors	N	N	N		13								X

Grand Gulf System/Structure Summary

System	System Description	System Includes Safety Related Components	Modelled In the PRA	MFR Risk Significant	Number of Safety Related Components	Total Components	SS Criterion 1	SS Criterion 2	SS Criterion 3	SS Criterion 4	SS Criterion 5	SS Criterion 6	Other SS	LSS
X42	EOF Fire Protection System	N	N	N										X
X43	EOF Decon Shower Waste Holding System	N	N	N										X
X44	EOF Domestic Water System	N	N	N		10								X
X45	EOF Doors	N	N	N		21								X
X46	EOF Emerg Diesel Gen	N	N	N		26								X
X47	Emerg Ops Facility HVAC	N	N	N		31								X
X50	Water Treatment Bldg	N	N	N										X
X51	Excavation	N	Y	N										X
X52	Substructure	N	N	N										X
X53	Superstructure	N	N	N										X
X54	Stairs and Miscellaneous Platforms	N	N	N										X
X57	Water Treatment Bldg Ventilation	N	N	N		118								X
X58	Water Treatment Bldg Vacuum to Clean Lab	N	N	N		7								X
X60	Radial Well Sewr Pumphouse	N	N	N		3								X
X70	Diesel Gen Bldg Structure	Y	N	N	8	21								X
X71	Excavation	N	N	N										X
X72	DG Bld Substructure	Y	N	N										X
X73	DG Bld Superstructure	Y	N	N										X
X75	Stairs and Miscellaneous Platforms	N	N	N										X
X76	Pipe Restraints	N	N	N										X
X77	Diesel Gen Bldg Ventilation	Y	Y	Y	37	82	X							X
X80	Modification and Engineering (MAE) Facility	N	N	N										X
X81	Chemistry Support Facility	N	N	N										X
X81	Recovery	N	N	N										X
X92	Lighting, Communication & Fire Alarms (Other Bldgs, including DG bldg)	N	N	N										X
X93	Grounding	N	N	N										X
Y10	Yard Building	N	N	N										X
Y100	Ground Water Monitoring	N	N	N										X
Y11	Excavations	N	N	N										X
Y12	Grading and Landscaping	N	N	N										X
Y13	Drainage Structures	N	N	N										X
Y21	Yard Substructure	N	N	N		14								X
Y22	Yard Superstructure	Y	N	N										X

Grand Gulf System/Structure Summary

System	System Description	System Includes Safety Related Components	Modeled in the PRA	MR Risk Significant	Number of Safety Related Components	Total Components	SS Criterion 1	SS Criterion 2	SS Criterion 3	SS Criterion 4	SS Criterion 5	SS Criterion 6	Other	LSS
Y23	Roads and Walks	N	N	N										X
Y24	Railroads	N	N	N										X
Y25	Barge Dock	N	N	N										X
Y26	Property and Plots	N	N	N										X
Y27	Fencing	N	N	N										X
Y31	Cranes, Hoists & Elevators	N	N	N		21								X
Y32	Meteorological Tower	N	N	N										X
Y35	Underground Piping	Y	N	N										X
	Underground Electrical (Cathodic Protection)		N	N										X
Y36	Temporary Construction	N	N	N										X
Y37	Batch Plant	N	N	N										X
Y38	Diesel Fuel Storage Tank Vault		N	N										X
Y40	Standby Water Basin Substructure	Y	N	N	6	6								X
Y41	Standby Water Basin Superstructure	Y	N	N	19	117								X
Y47	Standby Service Water Pumphouse Ventilation	Y	Y	Y	47	75	X							X
Y48	Condensate and Refueling Water Tank Basin		N	N										X
Y50	Plant Service Water Intake Structure	N	N	N										X
Y51	Excavation	N	N	N										X
Y52	Substructure	N	N	N										X
Y53	Superstructure	N	N	N										X
Y56	Service Water Intake Structure	N	N	N		69								X
Y57	Ventilation		N	N										X
Y58	Underground Piping		N	N										X
Y59	Screen Wash System		N	N										X
Y59	Screens, Trash Racks, and Rakes		N	N										X
Y60	Fire Water Pumphouse	N	N	N		8								X
Y61	Excavation	N	N	N										X
Y62	Substructure	N	N	N										X
Y63	Superstructure	N	N	N										X
Y67	Fire Water Pumphouse Ventilation	N	N	N		50								X
Y70	Sewage Treatment Plant	N	N	N		43								X
Y71	Excavation	N	N	N										X
Y72	Substructure	N	N	N										X
Y73	Superstructure	N	N	N										X
Y76	Sewage Treatment Plant Ventilation System	N	N	N										X

G. and Gulf System/Structure Summary

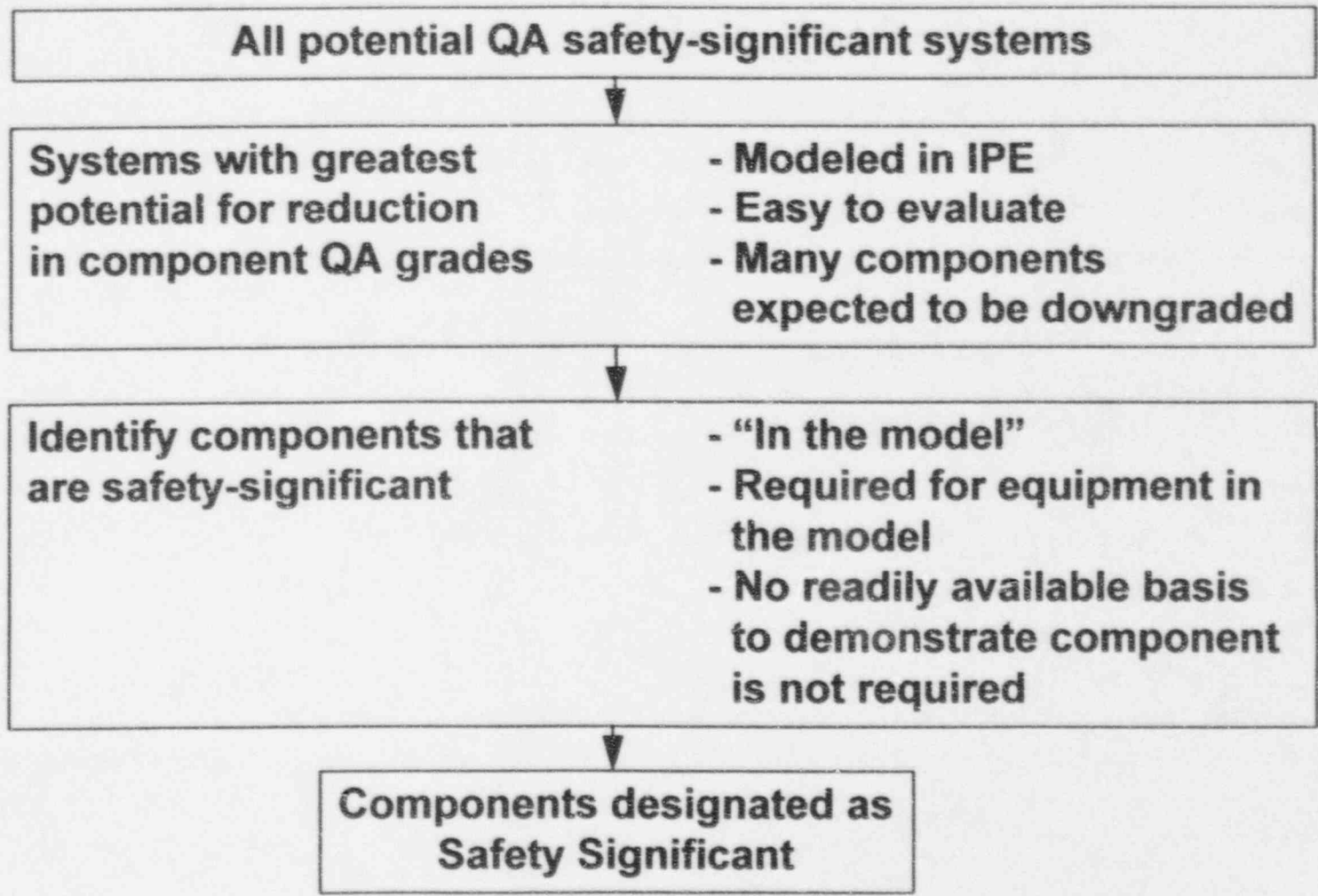
System	System Description	System Includes Safety Related Components	Modelled in the PPA	MR Risk Significant	Number of Safety Related Components	Total Components	SS Criterion 1	SS Criterion 2	SS Criterion 3	SS Criterion 4	SS Criterion 5	SS Criterion 6	Other SS	LSS
Y80	Standby Service Water Cooling Towers		N	N										X
Y91	Racemetry	Y	N	N										X
Y92	Lighting, Communication & Fire Alarms (Yard)	N	N	N		10								X
Y93	Grounding	Y	N	N	29	143								X
Z10	Control Bldg	N	N	N										X
Z11	Excavation	N	N	N										X
Z12	Substructure	N	N	N										X
Z13	Superstructure	N	N	N										X
Z17	Control Bldg HVAC	Y	N	N	5	263								X
Z18	Control Bldg Sanitary Waste	N	N	N		19								X
Z20	Stairs and Miscellaneous Platforms	N	N	N										X
Z31	Misc Cranes, Hoists & Elevators	N	N	N		6								X
Z32	Hot Machine Shop Equip	N	N	N		15								X
Z50	Control Room		N	N										X
Z51	Control Room HVAC	Y	N	N	423	500							X	
Z77	Emerg Swgr & Battery Rooms Ventilation	Y	N	N	177	252								X
Z91	Racemetry		N	N										X
Z92	Lighting, Communication & Fire Alarms (Control Room)	Y	N	N	50	97								X
Z93	Grounding		N	N										X

Progress To-Date

- Component level evaluation



Component Level Evaluation Steps



Grand Gulf Graded QA System Listing

- | | |
|--|---|
| <ul style="list-style-type: none"> + B13 Reactor System (Includes the RPV & internals;
CRs & Drives, Fuel & Piping) * B21 Nuclear Boiler System + B33 Reactor Recirculation System BXX RCS Pressure Boundary & Containment
Penetration Piping * C11 Control Rod Drive and Information System + C51 Neutron Monitoring System + C61 Remote Shutdown Panel C71 Reactor Protection System (RPS) * E12 Residual Heat Removal System (RHR) * E21 Low Pressure Core Spray System (LPCS) * E22 High Pressure Core Spray System (HPCS) E30 Suppression Pool Make-Up System (SPMU) * E51 Reactor Core Isolation Cooling System (RCIC) + E61 Combustible Gas Control + J11 Fuel * L11 ESF 125V Battery System * L21 125 VDC BOP System + L62 Inverters + M10 Containment + M23 Hatches and Locks | <ul style="list-style-type: none"> + M24 DW/SP/Upper Cnmt Pool * + P11 Condensate and Refueling Water Storage and
Transfer * P41 Standby Service Water System (SSW) * P42 Component Cooling Water System (CCW) + P43 Turbine Bldg. Cooling Water (TBCW) * P44 Plant Service Water System (PSW) + P47 Service Water Radial Wells * P53 Instrument Air System * P64 Fire Protection System + P65 Fire Detection System * P75 Standby Diesel Generator System * P81 HPCS Diesel Generator System + R12 6.9KV Transformers * R20 480 VAC Distribution System * R21 4.16KV Switchgear, Load Shedding and
Sequencing Panels System * R27 500 KV Circuit Breaker and Switchyard System + R60 Penetrations * T51 Emergency Pump Room Ventilation System * X77 Diesel Generator Building Ventilation System * Y47 Service Water Pump House Ventilation System + Z51 Control Room HVAC * MXX Containment Isolation Valves |
|--|---|

* Component level evaluation of this system has not been performed
 * Maintenance Rule Risk Significant System



Component Level Evaluation Basis for Criteria


- ◆ For the initial graded QA effort, we wanted:
 - A focus on safety function
 - Non-numerical, largely deterministic criteria that were not subject to the traditional PRA debate over uncertainties
- ◆ Since FSAR safety function description does not include severe accident space, it's not a good candidate
- ◆ PRA functional models, separate from their numerical attributes, incorporate our best knowledge as to safety function both within and outside of the plant's license/design basis
- ◆ Key criterion for component safety significance: Is it explicitly/implicitly modeled in IPE?

QASS Component Criteria

Criterion	Description	Basis	Examples
H1	If an engineer familiar with the PSA determines that a component is explicitly modeled as either a component or supercomponent, the component is classified as QASS.	All items explicitly described by basic events in the PSA are considered safety significant, pending numerical risk ranking.	An ECCS pump is explicitly identified with basic events representing the chance of failing to start and run.
H2	If an engineer familiar with the system determines that a component is needed to support another component or supercomponent modeled in the PSA, then the component is classified as QASS	The risk importance of a component modeled in the PSA depends on the reliability of the component's supporting parts. The Grand Gulf PSA frequently combines the failure rates of several supporting components into a single representative failure rate for the whole group.	A diesel generator may be the "component" in the model, but its reliability may be driven by a starting air solenoid valve.
H3	If a component has not been evaluated for its safety significance against other component level criteria, then the component is classified as QASS	To remain conservative, Grand Gulf will continue to classify components as QASS until it establishes a specific basis for grading components as non-QASS.	Logic control relay that may or may not support a safety significant function. A review of elementary diagrams will determine the relay's safety significance. However, the review may be a time consuming effort.
H4	If a component provides an instrumentation or actuation device that operators need to perform a PSA-modeled operator action for a QASS system, then the component is classified as QASS	The PSA models risk significant operator actions. Components that support those actions may have a high risk significance.	Failure of a water level instrument that an operator would use to isolate the RCIC system.
H5	If a component is not modeled in the PSA, but is nevertheless required to perform a risk significant function in other plant risk studies (IEEE and Shutdown), then the component is classified as QASS.	Some components may not be modeled in the PSA, but nevertheless have a role in one of the extensions to the PSA--either the IPEEE analyses or the shutdown risk analyses.	Seismic snubber

Non-QASS Component Criteria

Criterion	Description	Basis	Examples
L1	If a component is not modeled in any of the Grand Gulf risk studies, and is non-Q, then it can be classified as non-QASS (or LSS).	Non-modeled, non-Q components meet neither probabilistic nor deterministic criteria for safety significance.	The main turbine.
L2	If a component is not required for the system function modeled in the PSA, then it can be classified as non-QASS (or LSS).	Only components required to fulfill a safety significant function are potentially safety significant.	An instrument that monitors system readiness, but has no role in supporting operator actions required for accident response.
L3	If a component is in a flow path that could create only a small flow diversion, then it can be classified as non-QASS (or LSS).	Systems have enough design margin to tolerate a flow diversion caused by a small branch flow path.	Valves in instrument taps, vent lines, and drain lines.
L4	If a passive non-active component is considered highly reliable, regardless of its QA status, then it can be classified as non-QASS (or LSS).	Passive components are usually 100 times more reliable than active components.	Pipes.



Component Level Evaluation Process

- ◆ **Develop self-documenting, easily applied evaluation criteria**
- ◆ **Combine system component list with applicable IPE modeled events**
- ◆ **Train system engineer on component evaluation criteria with emphasis on defaulting to “safety significant” category if uncertain**
- ◆ **Categorize each component and document results**

COMPONENT LEVEL SAFETY SIGNIFICANCE EVALUATION
FOR THE GRAND GULF GRADED QA PROGRAM

LOW PRESSURE CORE SPRAY SYSTEM
(E21)

Prepared by: _____ Date

Reviewed by: _____ Date
Electrical Engineering Reviewer

_____ Date
Mechanical Engineering Reviewer

_____ Date
PRA Group Reviewer

Approved by: _____ Date
Graded QA Expert Panel Chairman

E21 System

Review Comments

Resolution of Review Comments

SYSTEM SUCCESS CRITERIA AND MODELING ASSUMPTIONS

The following is a brief discussion of the success criteria and assumptions utilized to determine the "grading" for LPCS components:

- The Graded QA Table was generated from a download of the SIMS and BE database files for specific systems on 4/22/94. Safety related, normally energized and intermittently energized relays are listed in the CDB (a subset of the SIMS database), remaining relays are not included in the CDB.
- For successful operation of LPCS, the system injection must be sufficient to provide cooling to the core during transient and LOCA events.
- Prior to the accident scenario, it is assumed that the plant is operating in a normal power configuration with all standby systems primed and configured for activation.
- The mission time for this evaluation is 24 hours.
- The LPCS System has the following dependencies--

AC Power → Division 1 4.16kV AC Bus 15AA and Division 1 480V AC MCC 15B11

DC Power → Division 1 125V DC Panel 1DA1

HVAC → Provides for pump room cooling in conjunction with the SSW system

SYSTEM ENGINEER REVIEW COMMENTS

The following is a collection of review comments provided by the System Engineer during the review process/discussion with the Initial Evaluator. Comments are listed below when the System Engineer and Initial Evaluator initially disagreed on the grading of a specific component. The comments are provided for documentation of the rationale utilized for changes of the initial component grade:

- ^{8/16/94} 1E21C007 -- The pump is essential to maintaining a primed LPCS system prior to the accident scenario. Normal check leakage could jeopardize the system coolant inventory and pressure boundary. Therefore, the pump and its breaker were given an "H3".
- 1E21D005 -- Based on plant specific experience and generic experience with BWR-6 plants, the grade for the LPCS strainer was changed to an "H3" since plugging or fouling of the strainer could adversely affect system performance. Had the LPCS strainer been modeled in the PRA it would

have been graded an H1. However, it was not modeled and therefore received an H3 for the reasons stated above.

INITIAL EVALUATOR RECOMMENDATIONS

The following are list of insights and recommendations provided to GGNS:

- The "H3" grade was used when a basis for another grade was not readily available or when time limits did not permit further investigation. A detailed study of plant maintenance records may provide the plant with sufficient justification for a lower grade for equipment (i.e. components given an H3 that could be an L5 or L6).
- Based on plant experience, the PRA staff should consider including basic events for the LPCS Jockey Pump and the LPCS Suppression Pool Strainer.
- The IPE system notebook for the E21 system needs to be signed-off.

Basis for Initial Evaluator and System Engineering Concurrence Review

Purpose: This paper identifies the methodology used in developing and reviewing the attached 'System Engineering Component Level Evaluation of Risk Significance for Grand Gulf Nuclear Station'.

- 1) Using the attached table (page 2) as a standard, the initial evaluator has completed the following:
 - a) Reviewed each component (SIMS data base components) and determined if explicitly or implicitly modeled in the PRA.
 - b) Components explicitly or implicitly modeled in the PRA were designated as a High Risk Significant component. (H1 or H2).
 - c) Components for which there is no basis for categorizing as low risk significant were designated High Risk Significant H3.
 - d) Where possible, H4 through H7 categories were designated¹.
 - e) Non-safety Related components not modeled in the PRA nor supporting a component or safety function modeled in the PRA were designated as Low Risk Significant L1.
 - f) Safety Related components not modeled in the PRA nor supporting a component or safety function modeled in the PRA were designated as Low Risk Significant L2.
 - g) Components in a small branch flow path (e.g., path diameter < 1/3 of main flow path) and do not significantly reduce the main flow path (such as vent and drain lines) have been designated Low Risk Significant L3.
- 2) The initial evaluator has applied the category L4 to components, considered by the Graded QA Verification Team as "highly reliable passive components". These components are:
 - a) Piping
 - b) Normally (locked and/or administratively controlled) isolation valves
 - c) Tanks and vessels
 - d) Piping orifices and flow elements
 - e) Cables and wiring
 - f) Handswitches in auto (with spring return to auto feature) where auto position does not affect a safety function
 - g) Other components, instruments and valves, whose only function is to maintain pressure boundary integrity
- 3) The System Engineer has completed the following:
 - a) Reviewed² and concurred with the risk significant determinations (based on the above initial evaluator review/evaluation).

Note: The High Risk and Low Risk categories are based solely on the above criteria. No credit, unless specifically stated in the justification column, was taken in the evaluation for component reliability or failure rates.

¹ Categories H4 through H7 as defined in "Work Instructions for the Evaluation of Risk Significance" Revision 0 dated 4/19/94.

² The System Engineer review is not intended as a Technical Review of the initial evaluator's risk significant determination.

DESCRIPTION	NM CAT	M CAT	ALT DISPOSITION	JUSTIFICATION
ANNUNCIATOR	L1			
BLOWER	H3	H1	L2 (PASSIVE) IF NOT MODELED	NEED RELIABILITY DATA
CALIBRATION	NULL	H1	DELETE FROM TABLE	M&TE
CALIBRATION UNIT	NULL		DELETE FROM TABLE	M&TE
CKTRK	L2/L1	H1, H2	L2/L1 FOR L2/L1 FUNCTION	
CONTAINMENT ISOLATION VLV	H7	H1		TRM
DO NOT USE	NULL		DELETE FROM TABLE	SYSTEM COMPONENT DELETED
FLOW ELEMENT	L4			PASSIVE, ANNUBARS/ORIFICE
FREQUENCY METER/TRANS	L2	H1	H4 FOR DO ONLY	
HEAT EXCHANGER	H3	H1	L3 (PASSIVE) IF NOT MODELED	NEED RELIABILITY DATA
HEATER	H3	H1	L3 (PASSIVE) IF NOT MODELED	NEED RELIABILITY DATA
INDICATORS	L2/L1	H1	H4 IF IN CR, L2/L1 OTHERWISE	PRESSURE, FLOW, TEMP, LEVEL
INSTRUMENT POWER SUPPLIES	H3	H1	L1/L2 FOR L1/L2 FUNCTION	
INSTRUMENT SIGNAL CONDITIONING	H3	H1	L1/L2 FOR L1/L2 FUNCTION	SQUARE ROOTERS, SCALARS
INSTRUMENTATION (CONTROLLERS)	H3	H1	L1/L2 FOR L1/L2 FUNCTION	REGULATORS, POSITIONERS, I/P, E/P, ALSO
METERS	L3	H1	H4 IF IN CR, L2/L1 FOR L2/L1 FUNCTION	CURRENT, VOLT
MOTOR	H3	H1	L3 (PASSIVE) IF NOT MODELED	NEED RELIABILITY DATA
PENETR & PIPE	L4	H1		PASSIVE
POSITION SWITCH	H3	H1	L2/L1 FOR L2/L1 FUNCTION	SWITCH INTERNAL TO VLV - VALVES CAT.
PROTECTIVE RELAYING	H2	H1	L2/L1 FOR L2/L1 FUNCTION	TIME O/C RELAY, 150/151, 150G, 157
PUMP	H2	H1	L2/L1 FOR L2/L1 FUNCTION	
PUMP (JOCKEY)	H2			SUPPORT ECCS SYSTEM OPERATION
RELAY	H3	H1	L2/L1 FOR L2/L1 FUNCTION	NEED RELIABILITY DATA
RELAY (TIME DELAY)	H3	H1	L2/L1 FOR L2/L1 FUNCTION	NEED RELIABILITY DATA
RELAY AGASTAT (INTERLOCK)	H3	H1	L2/L1 FOR L2/L1 FUNCTION	NEED RELIABILITY DATA
SNUBBER	H3			
SRU (RESISTOR)	H3		L2/L1 FOR L2/L1 FUNCTION	
STRAINER/FILTER	L4		ECCS SUCT STRAINER H2	ECCS STRAINER INDUSTRY PROB.
SWITCH (HANDSWITCH)	L4	H1, H2	L4 IF SPRING-RETURN-AUTO	PASSIVE COMPONENT
SWITCH (HANDSWITCH)	H3	H1, H2	L2/L1 FOR L2/L1 FUNCTION	START, TEST, BYPASS, MANUAL
SWITCH (INSTRUMENT)	H3	H1	L2/L1 FOR L2/L1 FUNCTION	LEVEL, TEMP, FLOW, PRESSURE
TEMPERATURE ELEMENT	H3	H1	L1/L2 FOR L1/L2 FUNCTION	NEED RELIABILITY PASSIVE
TRANSDUCER	L2	H1	H4 IF IN LOOP FOR CR	CURRENT, VOLTAGE
TRANSFORMER	H3	H1	L2/L1 FOR L2/L1 FUNCTION	
TRANSMITTER	H3	H1	L2/L1 FOR L2/L1 FUNCTION	PRESSURE, FLOW, TEMP
VALVE (AOV)	H3	H1, H2	L4 IF FAIL OPEN/CLOSED SAT FUNCTION	
VALVE (AOV/MOV)	H3	H1	L4 IF IN DESIGN POSITION-FAIL AS IS	
VALVE (BYPASS)	L4	H1	L4 FOR NC	REDUNDANT
VALVE (CHECK/BALL)	H3	H1	L4 IF MAINTAIN PRESSURE BOUNDARY	
VALVE (PCV)	H3	H1, H2	L4 IF FAIL OPEN/CLOSED SAT FUNCTION	
VALVE (RELIEF)	H3	H1	L3 IF MEETS L3 CRITERIA	SECONDARY PATH
VALVES (MANUAL)	L3/L4	H1, H2	L3 CRITERIA, OTHERWISE L4	ROOT, VENTS, ISOLATION, DRAIN
XISI	NULL		DELETE FROM TABLE	ISI PROCEDURE TRACKING
XMISC	NULL		DELETE FROM TABLE	TRACKING ENTRY

**PRA BASIC EVENTS LISTING FOR E21
(LPCS SYSTEM)**

EVENT	PROB	DESCRIPTION
E21-CC-CV003-G	1.00E-04	LPCS PUMP DISCHARGE CHECK VALVE F003 FAILS TO OPEN
E21-CC-MVF005A-G	3.00E-03	REACTOR INJECTION MOTOR-OPERATED VALVE F005-A FAILS TO OPEN
E21-CC-TCF006-G	1.00E-04	TESTABLE CHECK VALVE F006 FAILS TO OPEN
E21-FQ-HEECCS-G	1.00E+00	OPERATOR FAILS TO MANUALLY ACTUATE LPCS
E21-FR-MPC001A-G	7.20E-04	LPCS MOTOR-DRIVEN PUMP C001-A FAILS TO RUN
E21-FS-MPC001A-G	3.00E-03	LPCS MOTOR-DRIVEN PUMP C001-A FAILS TO START
E21-HW-FS-N651-H	1.40E-08	FLOW SWITCH -N651 FAILS TO FUNCTION
E21-HW-IC-G	3.00E-03	ACTUATION CIRCUITRY FAILS BECAUSE OF HARDWARE
E21-LF-FG-VLPCS	1.00E+00	INTERFACING SYSTEM LOCA IN LPCS INJECTION LINE
E21-MA-MPC001-G	2.00E-03	LPCS SYSTEM OUT FOR MAINTENANCE
E21-OC-MVF001A-G	1.00E-07	NORMALLY OPEN MOTOR DRIVEN VALVE F001A FAILS CLOSED
E21-OC-MVF011A-G	1.00E-07	NORMALLY OPEN MOTOR DRIVEN VALVE F011A FAILS CLOSED
E21-RE-LPCS-G	3.00E-03	FAILURE TO RESTORE LPCS AFTER MAINTENANCE

**LPCS SYSTEM (E21) EQUIPMENT
LISTING FROM SIMS DATABASE**

COMPONENT	SUFFIX	TYPE	DESC	SYS #	Q CODE	Q REG	Q REV
10288		SUPPORT	LPCS PUMP DISCHARGE LINE TO CONTAINMENT SNUBBER	E21	Q		Y
10290		SUPPORT	LPCS PUMP DISCHARGE LINE TO CONTAINMENT SNUBBER	E21	Q		Y
13078		SUPPORT	LPCS PUMP DISCHARGE LINE TO CONTAINMENT SNUBBER	E21	Q		Y
152-1506		CKTBRK	LPCS PUMP MOTOR 1E21C001A CIRCUIT BREAKER	E21	Q		Y
152-1506	IIA	INDREC	BREAKER 152-1506 IIA AMMETER	E21	Q		Y
152-1506	IIB	INDREC	BREAKER 152-1506 IIB AMMETER	E21	Q		Y
152-1506	IIC	INDREC	BREAKER 152-1506 IIC AMMETER	E21	Q		Y
152-1506-150-151M-A		RELAY	LPCS PMP MTR FEEDER BRKR INST TIME O/C RELAY	E21	Q		Y
152-1506-150-151M-B		RELAY	LPCS PMP MTR FEEDER BRKR INST TIME O/C RELAY	E21	Q		Y
152-1506-150-151M-C		RELAY	LPCS PMP MTR FEEDER BRKR INST TIME O/C RELAY	E21	Q		Y
152-1506-150G		RELAY	LPCS PMP 1E21C001A & MTR GROUND INST O/C RELAY	E21	Q		Y
152-1506-186M		RELAY	LPCS PMP MTR FEEDER BRKR LOCKOUT RELAY	E21	Q		Y
1E12R005-161124		RELAY	TIME DELAY RELAY FOR 1E12F042C	E21	Q		Y
1E21A-K104		RELAY	LPCS SYS INTERLOCK --DO NOT USE--	E21	Q	N	N
1E21A-K105		RELAY	LPCS SYS INTERLOCK --DO NOT USE--	E21	Q	N	N
1E21A-K106		RELAY	LPCS SYS INTERLOCK --DO NOT USE--	E21	Q	Q	N
1E21A-K107		RELAY	LPCS SYS INTERLOCK --DO NOT USE--	E21	Q	N	N
1E21A-K108		RELAY	LPCS SYS INTERLOCK --DO NOT USE--	E21	Q	N	N
1E21A-K109		RELAY	LPCS SYS INTERLOCK --DO NOT USE--	E21	Q	N	N
1E21A-K110		RELAY	LPCS SYS INTERLOCK --DO NOT USE--	E21	Q	N	N
1E21A-K120		RELAY	TIME DELAY RELAY FOR RX LOW WATER TRIP-DO NOT USE	E21	Q	N	N
1E21A-K121		RELAY	TIME DELAY RELAY FOR RX LOW WATER TRIP-DO NOT USE	E21	Q	N	N
1E21A-K122		RELAY	TIME DELAY RELAY FOR LPCS- DO NOT USE -	E21	Q	N	N
1E21A-K123		RELAY	TIME DELAY RELAY FOR RCIC/OUT OF SERVICE-DO NOT USE	E21	Q	N	N
1E21AK001		RELAY	AGASTAT RELAY SKELETAL ENTRY FOR WO/TASKS	E21	Q		Y
1E21AK012		RELAY	LPCS PUMP MANUAL OVERRIDERELAY	E21	Q	Q	Y
1E21AK017		RELAY	AGASTAT RELAY SKELETAL ENTRY FOR WO/TASKS	E21	Q		Y
1E21AK041		RELAY	AGASTAT RELAY SKELETAL ENTRY FOR WO/TASKS	E21	Q		Y
1E21AK044		RELAY	AGASTAT RELAY SKELETAL ENTRY FOR WO/TASKS	E21	Q		Y
1E21AK045		RELAY	LOW PRESSURE CORE SPRAY SYSTEM TESTABILITY RELAY	E21	Q	QF1	Y
1E21AK046		RELAY	LOW PRESSURE CORE SPRAY SYSTEM TESTABILITY RELAY	E21	Q	QF1	Y
1E21AK047		RELAY	LOW PRESSURE CORE SPRAY SYSTEM TESTABILITY RELAY	E21	Q	QF1	Y
1E21AK048		RELAY	LOW PRESSURE CORE SPRAY SYSTEM TESTABILITY RELAY	E21	Q	QF1	Y
1E21AK049		RELAY	LOW PRESSURE CORE SPRAY SYSTEM TESTABILITY RELAY	E21	Q	QF1	Y
1E21AK050		RELAY	AGASTAT RELAY SKELETAL ENTRY FOR WO/TASKS	E21	Q		Y
1E21AK102		RELAY	AGASTAT RELAY SKELETAL ENTRY FOR WO/TASKS	E21	Q		Y
1E21AK104		RELAY	LPCS SYS INTERLOCK	E21	Q	Q	Y
1E21AK105		RELAY	LPCS SYS INTERLOCK	E21	Q	Q	Y
1E21AK106		RELAY	LPCS SYS INTERLOCK	E21	Q	Q	Y
1E21AK107		RELAY	LPCS SYS INTERLOCK	E21	Q	Q	Y
1E21AK108		RELAY	LPCS SYS INTERLOCK	E21	Q	Q	Y
1E21AK109		RELAY	LPCS SYS INTERLOCK	E21	Q	Q	Y
1E21AK110		RELAY	LPCS SYS INTERLOCK	E21	Q	Q	Y
1E21AK120		RELAY	TIME DELAY RELAY FOR RX	E21	Q	QF1	Y
1E21AK121		RELAY	TIME DELAY RELAY FOR RX	E21	Q	QF1	Y
1E21AK122		RELAY	TIME DELAY RELAY FOR LPCS	E21	Q	QF1	Y
1E21AK123		RELAY	TIME DELAY RELAY FOR RCIC	E21	Q	QF1	Y
1E21AK150		RELAY	AGASTAT RELAY	E21	Q	QF1	Y
1E21AZ11		INTCPM	CALIBRATION UNIT ROSEMOUT	E21	Q	Q	Y
1E21AZ12		INTCPM	CALIBRATION UNIT ROSEMOUT	E21	Q	Q	Y
1E21AZ13		INTCPM	CALIBRATION UNIT ROSEMOUT	E21	Q	Q	Y
1E21AZ14		INTCPM	CALIBRATION UNIT ROSEMOUT	E21	Q	Q	Y
1E21AZ15		INTCPM	CALIBRATION UNIT ROSEMOUT	E21	Q	Q	Y
1E21AZ16		INTCPM	CALIBRATION UNIT ROSEMOUT	E21	Q	Q	Y
1E21AZ21		INTCPM	CALIBRATION UNIT ROSEMOUT	E21	Q	Q	Y
1E21AZ31		INTCPM	CALIBRATION UNIT ROSEMOUT	E21	Q	Q	Y
1E21AZ41		INTCPM	CALIBRATION UNIT ROSEMOUT	E21	Q	Q	Y
1E21AZ51		INTCPM	CALIBRATION UNIT ROSEMOUT	E21	Q	Q	Y
1E21AZ61		INTCPM	CALIBRATION UNIT ROSEMOUT	E21	Q	Q	Y
1E21C001		MOTOR	LPCS PUMP MOTOR	E21	Q		N
1E21C001		PUMP	LPCS PUMP	E21	Q		N
1E21C002		MOTOR	LPCS JOCKEY PUMP MOTOR	E21	Q		Y
1E21C002		PUMP	LPCS JOCKEY PUMP	E21	Q		Y
1E21D001		PIPE	RESTRICTING ORIFICE LPCS PUMP RECIRC	E21	Q		Y
1E21D002		PIPE	RESTRICTING ORIFICE LPCS INJ	E21	Q		Y
1E21D003		PIPE	RSTRNG ORIFICE LPCS JOCKEY PUMP RECIRC	E21	Q		Y
1E21D004		PIPE	14 IN RESTRICTING ORIFICEPLATE	E21	Q		Y

COMPONENT	SUFFIX	TYPE	DESC	SYS #	Q CODE	Q REG	Q REV
1E21D005		FILTER	LPCS C001 SUPP POOL SUCTION STRAINER	E21	Q		Y
1E21D007		PIPE	LPCS PUMP DISCHARGE SPECTACLE	E21	Q	Q	Y
1E21F001		VALVE	INBOARD LPCS PUMP SUCTIONVALVE	E21	Q	Q	Y
1E21F001		VALVOP	INBOARD LPCS PUMP SUCTIONVALVE	E21	Q	Q	Y
1E21F003		VALVE	LPCS PUMP DISCHARGE CHECKVALVE	E21	Q		Y
1E21F004		VALVE	BYPASS VALVE FOR 1E21F003CHECK VALVE	E21	Q		Y
1E21F005		VALVE	LPCS PMP C001A TO REACTORVESSEL ISOL VALVE	E21	Q	Q	Y
1E21F005		VALVOP	LPCS PMP C001A TO REACTORVESSEL ISOL VALVE	E21	Q	Q	Y
1E21F006		VALVE	LPCS TESTABLE CHECK VALVE	E21	Q		Y
1E21F006		VALVOP	LPCS TESTABLE CHECK VALVE	E21	Q		Y
1E21F007		VALVE	LOW PRESSURE CORE SPRAY CNT SIDE MANUAL ISOL VLV	E21	Q		Y
1E21F007		VALVOP	LOW PRESSURE CORE SPRAY CNT SIDE MANUAL ISOL VLV	E21	Q		Y
1E21F008		VALVE	ISOLATION VALVE TO RHR FLUSHING LINE	E21	Q		Y
1E21F009		VALVE	LPCS FLUSHING DRAIN TO RHR SYSTEM CHECK VALVE	E21	N	N	Y
1E21F011		VALVE	LPCS MIN FLOW TO SUPP POOL ISOL VALVE	E21	Q	Q	Y
1E21F011		VALVOP	LPCS MIN FLOW TO SUPP POOL ISOL VALVE	E21	Q	Q	Y
1E21F012		VALVE	LPCS TEST RET TO SUPP POOL ISOL VLV	E21	Q	Q	Y
1E21F012		VALVOP	LPCS TEST RET TO SUPP POOL ISOL VLV	E21	Q	Q	N
1E21F013		VALVE	ISOLATION VALVE FOR TEST CONNECTION	E21	Q		Y
1E21F014		VALVE	ISOLATION VALVE FOR TEST CONNECTION	E21	Q		Y
1E21F018		VALVE	LPCS FLUSHING WATER SPLY LINE SAFETY RELIEF VALVE	E21	Q		N
1E21F025		VALVE	LPCS FLUSHING WTR ISOL VLV TO PUMP DISCH HDR	E21	Q		Y
1E21F027		VALVE	LPCS SEAL VENT ISOLATION VALVE	E21	Q		Y
1E21F028		VALVE	LPCS SUCTION VENT VALVE	E21	Q		Y
1E21F031		VALVE	LPCS JOCKEY PUMP C002A SUCT LN SAFETY RELIEF VLV	E21	Q		N
1E21F032		VALVE	LPCS JOCKEY PUMP C002A SUCTION ISOLATION VALVE	E21	Q		Y
1E21F034		VALVE	LPCS JOCKEY PUMP DISCH STOP CHECK VALVE	E21	Q		Y
1E21F035		VALVE	LPCS JOCKEY PUMP DISCH TORHR FLUSH LINE ISOL VLV	E21	Q		Y
1E21F036		VALVE	FPCG TO LPCS PUMP SUCTIONISOLATION VALVE	E21	Q		Y
1E21F036		VALVOP	FPCG TO LPCS PUMP SUCTIONISOLATION VALVE GEARBOX	E21	Q		Y
1E21F200		VALVE	LPCS PMP DISCH TO RPV LINE DRAIN ISOLATION VLV	E21	Q		Y
1E21F201		VALVE	LPCS PUMP DISCH TEST CONN ISOL VLV	E21	Q		Y
1E21F202		VALVE	LPCS PUMP DISCH TEST CONN ISOL VLV	E21	Q		Y
1E21F203		VALVE	LPCS PUMP DISCH LINE DRN ISOL VALVE	E21	Q		Y
1E21F204		VALVE	LPCS PMP C001A DISCH TO RPV LINE DRAIN VALVE	E21	Q		Y
1E21F205		VALVE	LPCS PUMP MIN FLOW MANUALISOL VALVE	E21	Q		Y
1E21F206		VALVE	LPCS PUMP DISCH LINE DRN VLV	E21	Q		Y
1E21F207		VALVE	LPCS PUMP DISCH LINE DRN ISOL VALVE	E21	Q		Y
1E21F208		VALVE	LPCS PUMP SEAL VENT VLV	E21	Q		Y
1E21F209		VALVE	LPCS PUMP SUCTION VENT VLV	E21	Q		Y
1E21F210		VALVE	LPCS PMP DISCH TO RPV LINE DRAIN VALVE	E21	Q		Y
1E21F211		VALVE	LPCS PMP C001A SUCT LINE DRAIN ISOLATION VLV	E21	Q		Y
1E21F212		VALVE	LPCS PMP C001A SUCTION LINE DRAIN VALVE	E21	Q		Y
1E21F213		VALVE	LPCS PUMP DISCH LINE DRN ISOL VLV	E21	Q		Y
1E21F214		VALVE	LPCS PUMP DISCH LINE DRN VLV	E21	Q		Y
1E21F217		VALVE	LPCS PMP C001A DISCH TO SUPP PL LINE DRN ISOL VLV	E21	Q		Y
1E21F218		VALVE	LPCS PMP C001A DISCH TO SUPP PL LINE DRAIN VALVE	E21	Q		Y
1E21F221		VALVE	TEST CONN INLET ISOLATIONVALVE FOR ROD004	E21	Q		Y
1E21F222		VALVE	TEST CONN OUTLET ISOL VALVE FOR ROD004	E21	Q		Y
1E21F223		VALVE	LPCS JOCKEY PUMP DISCH DRN ISOL VALVE	E21	Q		Y
1E21F224		VALVE	LPCS JOCKEY PUMP DISCH DRN VLV	E21	Q		Y
1E21F225		VALVE	TEST CONN ISOL VALVE FOR LPCS JOCKEY PUMP SUCT	E21	Q		Y
1E21F226		VALVE	TEST CONN VALVE FOR LPCS JOCKEY PUMP SUCT	E21	Q		Y
1E21F227		VALVE	LPCS MIN-FLOW/TEST LINE VENT VALVE	E21	N	N	Y
1E21F502		VALVOP	LPCS TESTABLE CHECK VALVE006 SOLENOID	E21	Q	QF3	Y
1E21FX002		VALVE	ROOT VALVE FOR 1E21R001	E21	Q		Y
1E21FX003		VALVE	ROOT VALVE FOR 1E21N00	E21	Q		Y
1E21FX004		VALVE	ROOT VALVE FOR FTN003, FTN051	E21	Q	QF1	Y
1E21FX005		VALVE	ROOT VALVE FOR PT-N050	E21	Q		Y
1E21FX006		VALVE	ROOT VALVE FOR PTN054	E21	Q	QF2	Y
1E21FX008		VALVE	ROOT VALVE FOR 1E21 PP N400	E21	Q		Y
1E21FX009		VALVE	ROOT VALVE FOR PP N401	E21	Q	QP	Y
1E21FX010		VALVE	ROOT VALVE FOR PP N403	E21	Q		Y
1E21FX012		VALVE	ROOT VALVE FOR PT-N052, PT-N053, PI-R002	E21	Q		Y
1E21FX013		VALVE	ROOT VALVE	E21	Q		Y
1E21FX020		VALVE	ROOT VALVE FOR PP N404	E21	Q		Y
1E21G001R05		SUPPORT	LPCS PUMP DISCHARGE LINE TO CONTAINMENT SNUBBER	E21	Q		Y

COMPONENT	SUFFIX	TYPE	DESC	SYS #	Q CODE	Q REQ	Q REV
1E21G001R07	S-1	SUPPORT	LPCS PUMP DISCHARGE LINE TO CONTAINMENT SNUBBER	E21	Q		Y
1E21G001R07	S-2	SUPPORT	LPCS PUMP DISCHARGE LINE TO CONTAINMENT SNUBBER	E21	Q		Y
1E21G002R01		SUPPORT	LPCS LINE TO RPV SNUBBER	E21	Q		Y
1E21G002R02		SUPPORT	LPCS LINE TO RPV SNUBBER	E21	Q		Y
1E21G002R03		SUPPORT	LPCS LINE TO RPV SNUBBER	E21	Q		Y
1E21G002R04		SUPPORT	LPCS LINE TO RPV SNUBBER	E21	Q		Y
1E21G002R05		SUPPORT	LPCS LINE TO RPV SNUBBER	E21	Q		Y
1E21G002R06		SUPPORT	LPCS LINE TO RPV SNUBBER	E21	Q		Y
1E21G002R07		SUPPORT	LPCS LINE TO RPV SNUBBER	E21	Q		Y
1E21G501		PENETR	FLUED HEAD	E21	Q		Y
1E21G502		PENETR	FLUED HEAD	E21	Q		Y
1E21G503		PIPE	LPCS PUMP DISCHARGE RING SPACER -DO NOT USE-	E21	Q		N
1E21K701		IPWSUP	ECCS DIVISION 1 TRIP UNITSTATIC CONVERTER	E21	Q	QF1	N
1E21K702		IPWSUP	ECCS DIVISION 1 TRIP UNITPOWER SUPPLY	E21	Q	QF1	Y
1E21K703		IPWSUP	ECCS DIVISION 1 ISOLATOR POWER SUPPLY	E21	Q	QF1	Y
1E21L600		ANNUNC	LPCS PMP DISCH PRESS ABNORMAL ALARM	E21	N	N	Y
1E21L602		ANNUNC	LPCS INJ VLV F005 PRESS PERM OPEN ALARM	E21	N	N	Y
1E21L603		ANNUNC	ECCS DIV 1 SAFETY ASSOC TRIP UNIT TROUBLE ALARM	E21	N	N	Y
1E21L604		ANNUNC	LPCS PMP OVELD ALARM	E21	N	N	Y
1E21L605		ANNUNC	LPCS SYS ACTIVATED ALARM	E21	N	N	Y
1E21L606		ANNUNC	LPCS SYS OOSVC ALARM	E21	N	N	Y
1E21L607		ANNUNC	ECCS DIV 125V DC ISOL PWRLOSS ALARM	E21	N	N	Y
1E21L608		ANNUNC	ECCS DIV 1 ISOL QTPT CARDFILE ALARM	E21	N	N	Y
1E21L609		ANNUNC	ECCS DIV 1 24 VDC ISOL PWRLOSS ALARM	E21	N	N	Y
1E21L610		ANNUNC	LPCS PMP AUTO START ALARM	E21	N	N	Y
1E21L611		ANNUNC	LPCS PMP MAN OVRD ALARM	E21	N	N	Y
1E21L612		ANNUNC	LPCS INJ VLV F006 MAN OVERRD ALARM	E21	N	N	Y
1E21M600		IBSSW	LPCS PUMP SUCTION VALVE HANDSWITCH	E21	Q	QF1	Y
1E21M601		IBSSW	LPCS INJECTION SHUTOFF VALVE HANDSWITCH	E21	Q	QF1	Y
1E21M602		IBSSW	LPCS TESTABLE CHECK VALVEHANDSWITCH	E21	Q	QF1	Y
1E21M604		IBSSW	LPCS MIN FLOW VALVE HANDSWITCH	E21	Q	QF1	Y
1E21M606		IBSSW	LPCS TEST RETURN VALVE HANDSWITCH	E21	Q	QF1	Y
1E21M610		IBSSW	LPCS PUMP HANDSWITCH	E21	Q	QF1	Y
1E21M611		IBSSW	LPCS JOCKEY PUMP HANDSWITCH	E21	Q	QF1	Y
1E21M612		IBSSW	LPCS OUT OF SERVICE ANNUNCIATOR SWITCH	E21	Q	QF1	Y
1E21M613		IBSSW	LPCS/RHR A MANUAL INITIATION SWITCH	E21	Q	QF1	Y
1E21M614		IBSSW	LPCS/RHR A INITIATION RESET SWITCH	E21	Q	QF1	Y
1E21M615		IBSSW	LPCS MOV TEST PREPARATIONSWITCH	E21	Q	QF1	Y
1E21M616		IBSSW	DIESEL A TEST SWITCH	E21	Q	QF1	Y
1E21M617		IBSSW	POWER AVAILABILITY TEST SWITCH	E21	Q	QF1	Y
1E21M618		IBSSW	LOGIC POWER MONITOR SWITCH	E21	Q	QF1	Y
1E21M619		IBSSW	INVERTER POWER TEST SWITCH	E21	Q	QF2	Y
1E21N002		IXMITR	LPCS TO REACTOR VESSEL FLOW ELEMENT	E21	Q	QP	Y
1E21N003		IXMITR	LPCS PUMP DISCHARGE FLOW TRANSMITTER	E21	Q	QF1	N
1E21N050		IXMITR	LPCS INJECTION VALVE PRESSURE TRANSMITTER	E21	Q	QF2	Y
1E21N051		IXMITR	LPCS PUMP DISCHARGE FLOW TRANSMITTER	E21	Q	QF1	N
1E21N052		IXMITR	LPCS PUMP DISCHARGE PRESS(ADS CH A) TRANSMITTER	E21	Q	QF1	Y
1E21N053		IXMITR	LPCS PUMP DISCHARGE PRESS(ADS CH B) TRANSMITTER	E21	Q	QF1	Y
1E21N054		IXMITR	LPCS PUMP DISCH HI/LO PRESSURE TRANSMITTER	E21	Q	QF2	Y
1E21N100		IBSSW	LPCS PUMP SUCTION VALVE F001 POSITION SWITCH	E21	Q	QF2	Y
1E21N101		IBSSW	LPCS INJECTION SHUTOFF VLV F006 POSITION SWITCH	E21	Q	QF3	Y
1E21N102		IBSSW	TESTABLE CHECK VALVE F006ACTUATOR POSITION SWITCH	E21	Q	QF3	Y
1E21N103		IBSSW	TESTABLE CHECK VALVE F006DISC POSITION SWITCH	E21	Q	QF2	Y
1E21N104		IBSSW	LPCS MINIMUM FLOW VALVE F011 POSITION SWITCH	E21	Q	QF2	Y
1E21N105		IBSSW	LPCS MANUAL INJ SHUTOFF VALVE F007 POSN SWITCH	E21	Q	QF2	Y
1E21N106		IBSSW	LPCS TEST RETURN VALVE F012 POSITION SWITCH	E21	Q	QF2	Y
1E21N300		PIPE	LPCS PUMP SUCTION TEMPERATURE THERMOWELL	E21	Q	QP	Y
1E21N400		PIPE	LPCS PUMP SUCTION PRESSURE POINT	E21	Q	QP	Y
1E21N401		PIPE	LPCS PUMP SUCTION PRESSURE POINT	E21	Q	QP	Y
1E21N403		PIPE	LPCS JOCKY PUMP SUCTION PRESSURE POINT	E21	Q	QP	Y
1E21N404		PIPE	LPCS JOCKY PMP PRESS POINT	E21	Q	QP	Y
1E21N650		IBSSW	LPCS INJ VALVE PRESS LOW TEST PERMISSIVE SWITCH	E21	Q	QF2	Y
1E21N651		IBSSW	LPCS PUMP DISCHARGE FLOW SWITCH	E21	Q	QF1	Y
1E21N652		IBSSW	LPCS PUMP DISCHARGE PRESS(ADS CH A) SWITCH	E21	Q	QF1	Y
1E21N653		IBSSW	LPCS PUMP DISCHARGE PRESS(ADS CH B) SWITCH	E21	Q	QF1	Y
1E21N654		IBSSW	LPCS PUMP DISCHARGE PRESSSWITCH	E21	Q	QF2	Y

COMPONENT	SUFFIX	TYPE	DESC	SYS #	Q CODE	Q REQ	Q REV
1E21N655		IBSSW	LPCS PUMP DISCHARGE PRESSHIGH SWITCH	E21	Q	QF2	Y
1E21R001		INDREC	LPCS PUMP SUCTION PRESSURE INDICATOR	E21	Q		Y
1E21R001-151114		RELAY	TIME DELAY RELAY FOR 1E21F005	E21	Q		Y
1E21R002		INDREC	LPCS PUMP DISCHARGE PRESSURE INDICATOR	E21	Q	QF2	Y
1E21R600		INDREC	LPCS PUMP DISCHARGE FLOW INDICATOR	E21	Q		Y
52-151108		CKTBRK	LPCS JOCKEY PUMP Q1E21C002-A CKT BRKR	E21	Q		Y
52-151109		CKTBRK	LPCS PUMP SUCTION VLV Q1E21F001-A CKT BRKR	E21	Q		Y
52-151113		CKTBRK	LPCS TEST BYPASS VLV Q1E21F012-A CKT BRKR	E21	Q		Y
52-151114		CKTBRK	LPCS INJECTN SHUTOFF VLV Q1E21F005-A CKT BRKR	E21	Q		Y
52-151134		CKTBRK	LPCS MINIMUM FLOW VLV Q1E21F011-A CKT BRKR	E21	Q		Y
5230		SUPPORT	LPCS LINE TO RPV SNUBBER	E21	Q		Y
5243		SUPPORT	LPCS LINE TO RPV SNUBBER	E21	Q		Y
5268		SUPPORT	LPCS LINE TO RPV SNUBBER	E21	Q		Y
5287		SUPPORT	LPCS LINE TO RPV SNUBBER	E21	Q		Y
72-11A18		CKTBRK	PGCC PNL LPCS 1H13P629 & 1H13P736B CIRCUIT BREAKER	E21	Q		Y
72-11B35		CKTBRK	PGCC PNL 1H13P616 & 1H13P714E CIRCUIT BREAKER	E21	Q		Y
7373		SUPPORT	LPCS LINE TO RPV SNUBBER	E21	Q		Y
7425		SUPPORT	LPCS LINE TO RPV SNUBBER	E21	Q		Y
9098		SUPPORT	LPCS LINE TO RPV SNUBBER	E21	Q		Y
P-1087-01		XMISC	SYSTEM PRESSURE TEST (E21)	E21			Y
P-1087-02		XMISC	SYSTEM PRESSURE TEST (E21)	E21			Y
XXX E21		XISI	GENERIC ISI COMPONENT	E21			Y

**LPCS SYSTEM (E21)
GRADED QA ANALYSIS TABLE**

Component	BE Name	Type	S	DESC	BE DESC	Q Code	Design Req	JUST	INIT Dis	Design Dis	PRA DIS
10288		SUPPORT		LPCS PUMP DISCHARGE LINE TO CONTAINMENT SNUBBER		Q			H5		
10290		SUPPORT		LPCS PUMP DISCHARGE LINE TO CONTAINMENT SNUBBER		Q			H5		
13078		SUPPORT		LPCS PUMP DISCHARGE LINE TO CONTAINMENT SNUBBER		Q			H5		
152-1506		INDREC		BREAKER 152-1506 IIA AMMETER		Q			L2		
152-1506		INDREC		BREAKER 152-1506 IIB AMMETER		Q			L2		
152-1506		INDREC		BREAKER 152-1506 IIC AMMETER		Q			L2		
152-1506	E21-FR-MPC001A-G	CKTBRK	S	LPCS PUMP MOTOR 1E21C001A CIRCUIT BREAKER	LPCS MOTOR-DRIVEN PUMP C001-A FAILS TO RUN	Q			H2		
152-1506	E21-FS-MPC001A-G	CKTBRK	S	LPCS PUMP MOTOR 1E21C001A CIRCUIT BREAKER	LPCS MOTOR-DRIVEN PUMP C001-A FAILS TO START	Q			H2		
152-1506	E21-MA-MPC001-G	CKTBRK	S	LPCS PUMP MOTOR 1E21C001A CIRCUIT BREAKER	LPCS SYSTEM OUT FOR MAINTENANCE	Q			H2		
152-1506-150-151M-A		RELAY		LPCS PMP MTR FEEDER BRKR INST TIME O/C RELAY		Q			H3		
152-1506-150-151M-B		RELAY		LPCS PMP MTR FEEDER BRKR INST TIME O/C RELAY		Q			H3		
152-1506-150-151M-C		RELAY		LPCS PMP MTR FEEDER BRKR INST TIME O/C RELAY		Q			H3		
152-1506-150G		RELAY		LPCS PMP 1E21C001A & MTR GROUND INST O/C RELAY		Q			H3		
152-1506-186M		RELAY		LPCS PMP MTR FEEDER BRKR LOCKOUT RELAY		Q			H3		
1E12R005-161124		RELAY		TIME DELAY RELAY FOR 1E12F042C		Q			H3		
1E21AK001		RELAY		AGASTAT RELAY SKELETAL ENTRY FOR WO/TASKS		Q			L2		
1E21AK012		RELAY		LPCS PUMP MANUAL OVERRIDERELAY		Q			H3		

Component	BE Name	Type	S	DESC	BE DESC	Q Code	Design Req	JUST	INIT Dis	Design Dis	PRA DIS
1E21AK017		RELAY		AGASTAT RELAY SKELETAL ENTRY FOR WO/TASKS		Q			L2		
1E21AK041		RELAY		AGASTAT RELAY SKELETAL ENTRY FOR WO/TASKS		Q			L2		
1E21AK044		RELAY		AGASTAT RELAY SKELETAL ENTRY FOR WO/TASKS		Q			L2		
1E21AK045		RELAY		LOW PRESSURE CORE SPRAY SYSTEM TESTABILITY RELAY		Q			L2		
1E21AK046		RELAY		LOW PRESSURE CORE SPRAY SYSTEM TESTABILITY RELAY		Q			L2		
1E21AK047		RELAY		LOW PRESSURE CORE SPRAY SYSTEM TESTABILITY RELAY		Q			L2		
1E21AK048		RELAY		LOW PRESSURE CORE SPRAY SYSTEM TESTABILITY RELAY		Q			L2		
1E21AK049		RELAY		LOW PRESSURE CORE SPRAY SYSTEM TESTABILITY RELAY		Q			L2		
1E21AK050		RELAY		AGASTAT RELAY SKELETAL ENTRY FOR WO/TASKS		Q			L2		
1E21AK102		RELAY		AGASTAT RELAY SKELETAL ENTRY FOR WO/TASKS		Q			L2		
1E21AK104		RELAY		LPCS SYS INTERLOCK		Q			H3		
1E21AK105		RELAY		LPCS SYS INTERLOCK		Q			H3		
1E21AK106		RELAY		LPCS SYS INTERLOCK		Q			H3		
1E21AK107		RELAY		LPCS SYS INTERLOCK		Q			H3		
1E21AK108		RELAY		LPCS SYS INTERLOCK		Q			H3		
1E21AK109		RELAY		LPCS SYS INTERLOCK		Q			H3		
1E21AK110		RELAY		LPCS SYS INTERLOCK		Q			H3		
1E21AK120		RELAY		TIME DELAY RELAY FOR RX		Q			H3		
1E21AK121		RELAY		TIME DELAY RELAY FOR RX		Q			H3		
1E21AK122		RELAY		TIME DELAY RELAY FOR LPCS		Q			H3		
1E21AK123		RELAY		TIME DELAY RELAY FOR RCIC		Q			H3		

Component	BE Name	Type	S	DESC	BE DESC	Q Code	Design Req	JUST	INIT Dis	Design Dis	PRA DIS
1E21AK150		RELAY		AGASTAT RELAY		Q			H3		
1E21C001	E21-FR-MPC001A-G	MOTOR	D	LPCS PUMP MOTOR	LPCS MOTOR-DRIVEN PUMP C001-A FAILS TO RUN	Q			H1		
1E21C001	E21-FR-MPC001A-G	PUMP	D	LPCS PUMP	LPCS MOTOR-DRIVEN PUMP C001-A FAILS TO RUN	Q			H1		
1E21C001	E21-FS-MPC001A-G	MOTOR	D	LPCS PUMP MOTOR	LPCS MOTOR-DRIVEN PUMP C001-A FAILS TO START	Q			H1		
1E21C001	E21-FS-MPC001A-G	PUMP	D	LPCS PUMP	LPCS MOTOR-DRIVEN PUMP C001-A FAILS TO START	Q			H1		
1E21C001	E21-MA-MPC001-G	MOTOR	D	LPCS PUMP MOTOR	LPCS SYSTEM OUT FOR MAINTENANCE	Q			H1		
1E21C001	E21-MA-MPC001-G	PUMP	D	LPCS PUMP	LPCS SYSTEM OUT FOR MAINTENANCE	Q			H1		
1E21C001	HVC-CF-CUECCS-U	MOTOR	S	LPCS PUMP MOTOR	COMMON CAUSE FAILURE OF THE ECCS PUMP ROOM FAN COOLERS	Q			H2		
1E21C001	HVC-CF-CUECCS-U	PUMP	S	LPCS PUMP	COMMON CAUSE FAILURE OF THE ECCS PUMP ROOM FAN COOLERS	Q			H2		
1E21C002		MOTOR		LPCS JOCKEY PUMP MOTOR		Q			H3		
1E21C002		PUMP		LPCS JOCKEY PUMP		Q			H3		
1E21D001		PIPE		RESTRICTING ORIFICE LPCS PUMP RECIRC		Q			L4		
1E21D002		PIPE		RESTRICTING ORIFICE LPCS INJ		Q			L4		
1E21D003		PIPE		RSTRNG ORIFICE LPCS JOCKEY PUMP RECIRC		Q			L2		
1E21D004		PIPE		14 IN RESTRICTING ORIFICEPLATE		Q			L4		
1E21D005		FILTER		LPCS C001 SUPP POOL SUCTION STRAINER		Q			H3		

Component	BE Name	Type	S	DESC	BE DESC	Q Code	Design Req	JUST	INIT Dis	Design Dis	PRA DIS
1E21D007		PIPE		LPCS PUMP DISCHARGE SPECTACLE		Q			L4		
1E21F001	E21-OC-MVF001A-G	VALVE	D	INBOARD LPCS PUMP SUCTIONVALVE	NORMALLY OPEN MOTOR DRIVEN VALVE F001A FAILS CLOSED	Q			H1		
1E21F001	E21-OC-MVF001A-G	VALVOP	D	INBOARD LPCS PUMP SUCTIONVALVE	NORMALLY OPEN MOTOR DRIVEN VALVE F001A FAILS CLOSED	Q			H1		
1E21F003	E21-CC-CVF003-G	VALVE	D	LPCS PUMP DISCHARGE CHECKVALVE	LPCS PUMP DISCHARGE CHECK VALVE F003 FAILS TO OPEN	Q			H1		
1E21F004		VALVE		BYPASS VALVE FOR 1E21F003CHECK VALVE		Q		LC	L4		
1E21F005	E21-CC-MVF005A-G	VALVE	D	LPCS PMP C001A TO REACTORVESSEL ISOL VALVE	REACTOR INJECTION MOTOR-OPERATED VALVE F005-A FAILS TO OPEN	Q			H1		
1E21F005	E21-CC-MVF005A-G	VALVOP	D	LPCS PMP C001A TO REACTORVESSEL ISOL VALVE	REACTOR INJECTION MOTOR-OPERATED VALVE F005-A FAILS TO OPEN	Q			H1		
1E21F006	E21-CC-TCF006-G	VALVE	D	LPCS TESTABLE CHECK VALVE	TESTABLE CHECK VALVE F006 FAILS TO OPEN	Q			H1		
1E21F006	E21-CC-TCF006-G	VALVOP	D	LPCS TESTABLE CHECK VALVE	TESTABLE CHECK VALVE F006 FAILS TO OPEN	Q			H1		
1E21F007		VALVE		LOW PRESSURE CORE SPRAY CNT SIDE MANUAL ISOL VLV		Q		LO	L4		
1E21F007		VALVOP		LOW PRESSURE CORE SPRAY CNT SIDE MANUAL ISOL VLV		Q		LO	L4		
1E21F008		VALVE		ISOLATION VALVE TO RHR FLUSHING LINE		Q		LC	L4		

Component	BE Name	Type	S	DESC	BE DESC	Q Code	Design Req	JUST	INIT Dis	Design Dis	PRA DIS
1E21F009		VALVE		LPCS FLUSHING DRAIN TO RHR SYSTEM CHECK VALVE		N			L1		
1E21F011	E21-OC-MVF011A-G	VALVE	D	LPCS MIN FLOW TO SUPP POOL ISOL VALVE	NORMALLY OPEN MOTOR DRIVEN VALVE F011A FAILS CLOSED	Q			H1		
1E21F011	E21-OC-MVF011A-G	VALVOP	D	LPCS MIN FLOW TO SUPP POOL ISOL VALVE	NORMALLY OPEN MOTOR DRIVEN VALVE F011A FAILS CLOSED	Q			H1		
1E21F012		VALVE		LPCS TEST RET TO SUPP POOL ISOL VLV		Q	PCIV,TRM		H3		
1E21F012		VALVOP		LPCS TEST RET TO SUPP POOL ISOL VLV		Q	PCIV,TRM		H3		
1E21F013		VALVE		ISOLATION VALVE FOR TEST CONNECTION		Q		Fire Water Injection Path	H5		
1E21F014		VALVE		ISOLATION VALVE FOR TEST CONNECTION		Q		Fire Water Injection Path	H5		
1E21F018		VALVE		LPCS FLUSHING WATER SPLY LINE SAFETY RELIEF VALVE		Q			L3		
1E21F025		VALVE		LPCS FLUSHING WTR ISOL VLV TO PUMP DISCH HDR		Q		LC	L4		
1E21F027		VALVE		LPCS SEAL VENT ISOLATION VALVE		Q		NC	L4		
1E21F028		VALVE		LPCS SUCTION VENT VALVE		Q		NC	L4		
1E21F031		VALVE		LPCS JOCKEY PUMP C002A SUCT LN SAFETY RELIEF VLV		Q			L2		
1E21F032		VALVE		LPCS JOCKEY PUMP C002A SUCTION ISOLATION VALVE		Q			L2		
1E21F034		VALVE		LPCS JOCKEY PUMP DISCH STOP CHECK VALVE		Q			L2		

Component	BE Name	Type	S	DESC	BE DESC	Q Code	Design Req	JUST	INIT Dis	Design Dis	PRA Dis
1E21F035		VALVE		LPCS JOCKEY PUMP DISCH TORHR FLUSH LINE ISOL VLV		Q					
1E21F036		VALVE		FPCC TO LPCS PUMP SUCTION ISOLATION VALVE		Q		LC	L4		
1E21F036		VALVOP		FPCC TO LPCS PUMP SUCTION ISOLATION VALVE GEARBOX		Q		LC	L2		
1E21F200		VALVE		LPCS PMP DISCH TO RPV LINE DRAIN ISOLATION VLV		Q		LC	L4		
1E21F201		VALVE		LPCS PUMP DISCH TEST CONN ISOL VLV		Q			L2		
1E21F202		VALVE		LPCS PUMP DSCH TEST CONN ISOL VLV		Q			L2		
1E21F203		VALVE		LPCS PUMP DSCH LINE DRN ISOL VALVE		Q		NC	L4		
1E21F204		VALVE		LPCS PMP C001A DISCH TO RPV LINE DRAIN VALVE		Q		LC	L4		
1E21F205		VALVE		LPCS PUMP MIN FLOW MANUAL ISOL VALVE		Q		LO	L4		
1E21F206		VALVE		LPCS PUMP DISCH LINE DRN VLV		Q		NC	L4		
1E21F207		VALVE		LPCS PUMP DISCH LINE DRN ISOL VALVE		Q		LC	L4		
1E21F208		VALVE		LPCS PUMP SEAL VENT VLV		Q		NC	L4		
1E21F209		VALVE		LPCS PUMP SUCTION VENT VLV		Q		NC	L4		
1E21F210		VALVE		LPCS PMP DISCH TO RPV LINE DRAIN VALVE		Q		NC	L4		
1E21F211		VALVE		LPCS PMP C001A SUCT LINE DRAIN ISOLATION VLV		Q		NC	L4		
1E21F212		VALVE		LPCS PMP C001A SUCTION LINE DRAIN VALVE		Q		NC	L4		
1E21F213		VALVE		LPCS PUMP DSCH LINE DRN ISOL VLV		Q		NC	L4		
1E21F214		VALVE		LPCS PUMP DSCH LINE DRN VLV		Q		NC	L4		

Component	BE Name	Type	S	DESC	BE DESC	Q Code	Design Req	JUST	INIT Dis	Design Dis	PRA DIS
1E21F217		VALVE		LPCS PMP C001A DISCH TO SUPP PL LINE DRN ISOL VLV		Q		LC	L4		
1E21F218		VALVE		LPCS PMP C001A DISCH TO SUPP PL LINE DRAIN VALVE		Q		LC	L4		
1E21F221		VALVE		TEST CONN INLET ISOLATION VALVE FOR ROD004		Q		LC	L2		
1E21F222		VALVE		TEST CONN OUTLET ISOL VALVE FOR ROD004		Q		LC	L2		
1E21F223		VALVE		LPCS JOCKEY PUMP DISCH DRN ISOL VALVE		Q			L2		
1E21F224		VALVE		LPCS JOCKEY PUMP DISCH DRN VLV		Q			L2		
1E21F225		VALVE		TEST CONN ISOL VALVE FOR LPCS JOCKEY PUMP SUCT		Q			L2		
1E21F226		VALVE		TEST CONN VALVE FOR LPCS JOCKEY PUMP SUCT		Q			L2		
1E21F227		VALVE		LPCS MIN-FLOW/TEST LINE VENT VALVE		N			L1		
1E21F502		VALVOP		LPCS TESTABLE CHECK VALVEF006 SOLENOID		Q			L2		
1E21FX002		VALVE		ROOT VALVE FOR 1E21R001		Q			L4		
1E21FX003		VALVE		ROOT VALVE FOR 1E21N00		Q			L4		
1E21FX004		VALVE		ROOT VALVE FOR FTN003, FTN051		Q			L4		
1E21FX005		VALVE		ROOT VALVE FOR PT-N050		Q			L4		
1E21FX006		VALVE		ROOT VALVE FOR PTN054		Q			L4		
1E21FX008		VALVE		ROOT VALVE FOR 1E21 PP N400		Q			L4		
1E21FX009		VALVE		ROOT VALVE FOR PP N401		Q			L4		
1E21FX010		VALVE		ROOT VALVE FOR PP N403		Q			L4		
1E21FX012		VALVE		ROOT VALVE FOR PT-N052, PT-N053, PI-R002		Q			L4		
1E21FX013		VALVE		ROOT VALVE		Q			L4		
1E21FX020		VALVE		ROOT VALVE FOR PP N404		Q			L4		
1E21G001R05		SUPPORT		LPCS PUMP DISCHARGE LINE TO CONTAINMENT SNUBBER		Q			H5		

Component	BE Name	Type	S	DESC	BE DESC	Q Code	Design Req	JUST	INIT Dis	Design Dis	PRA DIS
1E21G001R07		SUPPORT		LPCS PUMP DISCHARGE LINE TO CONTAINMENT SNUBBER		Q			H5		
1E21G001R07		SUPPORT		LPCS PUMP DISCHARGE LINE TO CONTAINMENT SNUBBER		Q			H5		
1E21G002R01		SUPPORT		LPCS LINE TO RPV SNUBBER		Q			H5		
1E21G002R02		SUPPORT		LPCS LINE TO RPV SNUBBER		Q			H5		
1E21G002R03		SUPPORT		LPCS LINE TO RPV SNUBBER		Q			H5		
1E21G002R04		SUPPORT		LPCS LINE TO RPV SNUBBER		Q			H5		
1E21G002R05		SUPPORT		LPCS LINE TO RPV SNUBBER		Q			H5		
1E21G002R06		SUPPORT		LPCS LINE TO RPV SNUBBER		Q			H5		
1E21G002R07		SUPPORT		LPCS LINE TO RPV SNUBBER		Q			H5		
1E21G501		PENETR		FLUED HEAD		Q			L4		
1E21G502		PENETR		FLUED HEAD		Q			L4		
1E21K701		IPWSUP		ECCS DIVISION 1 TRIP UNITSTATIC CONVERTER		Q			H3		
1E21K702		IPWSUP		ECCS DIVISION 1 TRIP UNITPOWER SUPPLY		Q			H3		
1E21K703		IPWSUP		ECCS DIVISION 1 ISOLATOR POWER SUPPLY		Q			H3		
1E21L600		ANNUNC		LPCS PMP DISCH PRESS ABNORMAL ALARM		N			L1		
1E21L601		ANNUNC		LPCS INJ VLV F005 PRESS PERM OPEN ALARM		N			L1		
1E21L602		ANNUNC		LPCS/RHR A MAN INIT SWITCH IN ARMED POS ALARM		N			L1		
1E21L603		ANNUNC		ECCS DIV 1 SAFETY ASSOC TRIP UNIT TROUBLE ALARM		N			L1		
1E21L604		ANNUNC		LPCS PMP OVELD ALARM		N			L1		
1E21L605		ANNUNC		LPCS SYS ACTIVATED ALARM		N			L1		
1E21L606		ANNUNC		LPCS SYS OOSVC ALARM		N			L1		
1E21L607		ANNUNC		ECCS DIV 125V DC ISOL PWRLOSS ALARM		N			L1		
1E21L608		ANNUNC		ECCS DIV 1 ISOL OTPT CARDFILE ALARM		N			L1		
1E21L609		ANNUNC		ECCS DIV 1 24 VDC ISOL PWRLOSS ALARM		N			L1		

Component	BE Name	Type	S	DESC	BE DESC	Q Code	Design Req	JUST	INIT Dis	Design Dis	PRA DIS
1E21L610		ANNUNC		LPCS PMP AUTO START ALARM		N			L1		
1E21L611		ANNUNC		LPCS PMP MAN OVERD ALARM		N			L1		
1E21L612		ANNUNC		LPCS INJ VLV F005 MAN OVERRD ALARM		N			L1		
1E21M600		IBISSW		LPCS PUMP SUCTION VALVE HANDSWITCH		Q			H3		
1E21M601		IBISSW		LPCS INJECTION SHUTOFF VALVE HANDSWITCH		Q		RTA	L2		
1E21M602		IBISSW		LPCS TESTABLE CHECK VALVEHANDSWITCH		Q			L2		
1E21M604		IBISSW		LPCS MIN FLOW VALVE HANDSWITCH		Q		RTA	L2		
1E21M606		IBISSW		LPCS TEST RETURN VALVE HANDSWITCH		Q			L2		
1E21M610		IBISSW		LPCS PUMP HANDSWITCH		Q		RTA	L2		
1E21M611		IBISSW		LPCS JOCKEY PUMP HANDSWITCH		Q			L2		
1E21M612		IBISSW		LPCS OUT OF SERVICE ANNUNCIATOR SWITCH		Q			L2		
1E21M613		IBISSW		LPCS/RHR A MANUAL INITIATION SWITCH		Q			H3		
1E21M614		IBISSW		LPCS/RHR A INITIATION RESET SWITCH		Q			H3		
1E21M615		IBISSW		LPCS MOV TEST PREPARATIONSWITCH		Q			L2		
1E21M616		IBISSW		DIESEL A TEST SWITCH		Q			L2		
1E21M617		IBISSW		POWER AVAILABILITY TEST SWITCH		Q			L2		
1E21M618		IBISSW		LOGIC POWER MONITOR SWITCH		Q			H3		
1E21M619		IBISSW		INVERTER POWER TEST SWITCH		Q			L2		
1E21N002		IXMITR		LPCS TO REACTOR VESSEL FLOW ELEMENT		Q			L4		
1E21N003		IXMITR		LPCS PUMP DISCHARGE FLOW TRANSMITTER		Q			H3		

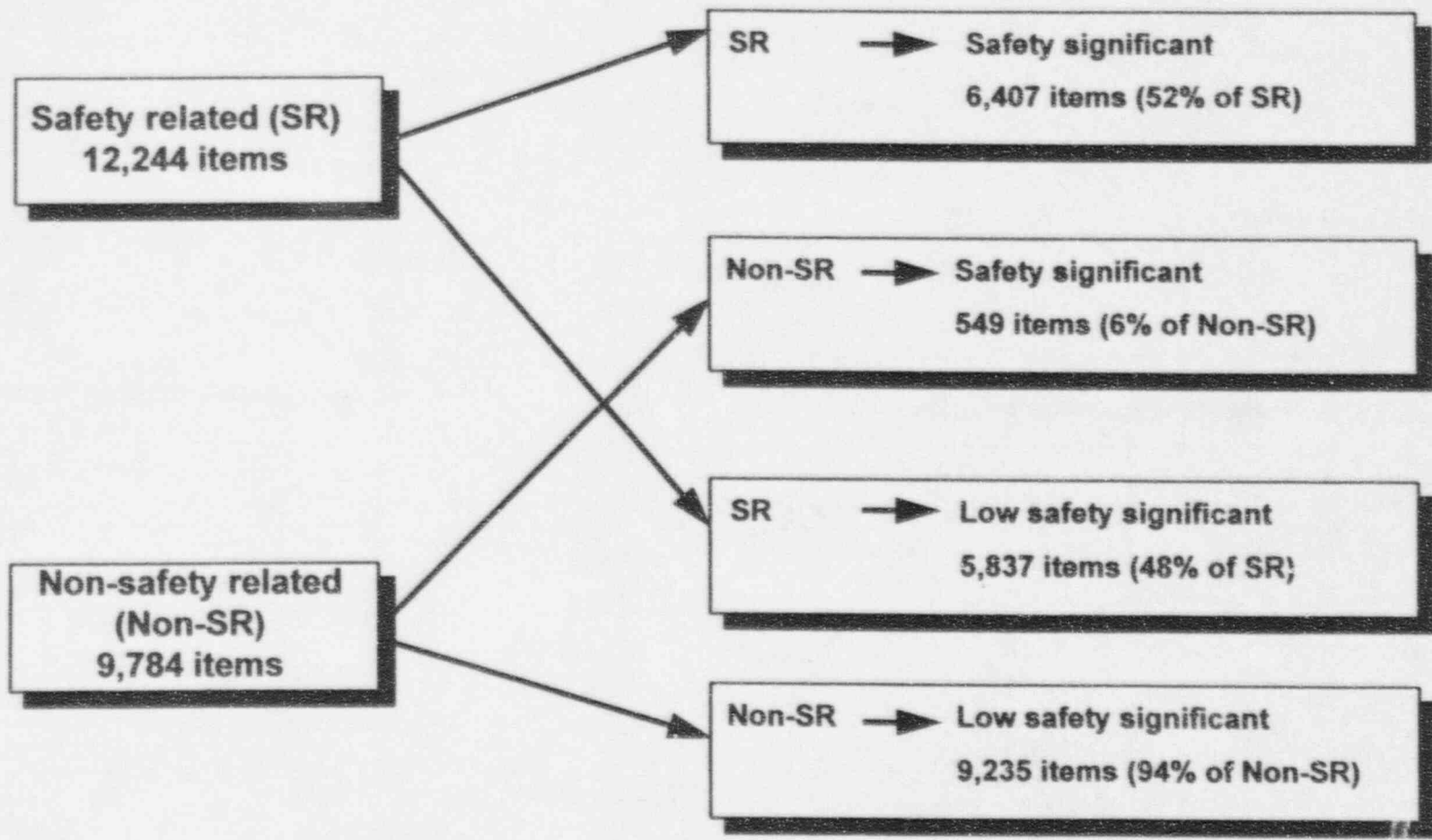
Component	BE Name	Type	S	DESC	BE DESC	Q Code	Design Req	JUST	INIT Dis	Design Dis	PRA DIS
1E21N050		IXMITR		LPCS INJECTION VALVE PRESSURE TRANSMITTER		Q			H3		
1E21N051		IXMITR		LPCS PUMP DISCHARGE FLOW TRANSMITTER		Q			H3		
1E21N052		IXMITR		LPCS PUMP DISCHARGE PRESS(ADS CH A) TRANSMITTER		Q			H3		
1E21N053		IXMITR		LPCS PUMP DISCHARGE PRESS(ADS CH B) TRANSMITTER		Q			H3		
1E21N054		IXMITR		LPCS PUMP DISCH HI/LO PRESSURE TRANSMITTER		Q			H3		
1E21N100		IBISSW		LPCS PUMP SUCTION VALVE F001 POSITION SWITCH		Q			H3		
1E21N101		IBISSW		LPCS INJECTION SHUTOFF VLV F005 POSITION SWITCH		Q			H3		
1E21N102		IBISSW		TESTABLE CHECK VALVE F006ACTUATOR POSITION SWITCH		Q			L2		
1E21N103		IBISSW		TESTABLE CHECK VALVE F006DISC POSITION SWITCH		Q			L2		
1E21N104		IBISSW		LPCS MINIMUM FLOW VALVE F011 POSITION SWITCH		Q			H3		
1E21N105		IBISSW		LPCS MANUAL INJ SHUTOFF VALVE F007 POSN SWITCH		Q			H3		
1E21N106		IBISSW		LPCS TEST RETURN VALVE F012 POSITION SWITCH		Q			H3		
1E21N300		PIPE		TEMPERATURE THERMOWELL		Q			L4		
1E21N400		PIPE		LPCS PUMP SUCTION PRESSURE POINT		Q			L4		
1E21N401		PIPE		LPCS PUMP SUCTION PRESSURE POINT		Q			L4		
1E21N403		PIPE		LPCS JCKY PUMP SUCTION PRESSURE POINT		Q			L4		
1E21N404		PIPE		LPCS JCKY PMP PRESS POINT		Q			L4		

Component	BE Name	Type	S	DESC	BE DESC	Q Code	Design Req	JUST	INIT Dis	Design Dis	PRA DIS
1E21N650		IBISSW		LPCS INJ VALVE PRESS LOW TEST PERMISSIVE SWITCH		Q			L2		
1E21N651	E21-HW-FS-N651-I	IBISSW	D	LPCS PUMP DISCHARGE FLOW SWITCH	FLOW SWITCH -N651 FAILS TO FUNCTION	Q			H1		
1E21N652		IBISSW		LPCS PUMP DISCHARGE PRESS(ADS CH A) SWITCH					H3		
1E21N653		IBISSW		LPCS PUMP DISCHARGE PRESS(ADS CH B) SWITCH		Q			H3		
1E21N654		IBISSW		LPCS PUMP DISCHARGE PRESSSWITCH		Q			H3		
1E21N655		IBISSW		LPCS PUMP DISCHARGE PRESSHIGH SWITCH		Q			H3		
1E21R001		INDREC		LPCS PUMP SUCTION PRESSURE INDICATOR		Q			H4		
1E21R001-151114		RELAY		TIME DELAY RELAY FOR 1E21F005		Q			H3		
1E21R002		INDREC		LPCS PUMP DISCHARGE PRESSURE INDICATOR		Q			H4		
1E21R600		INDREC		LPCS PUMP DISCHARGE FLOW INDICATOR		Q			H4		
52-151108		CKTBRK		LPCS JOCKEY PUMP Q1E21C002-A CKT BRKR		Q			H3		
52-151109	E21-OC-MVF001A-G	CKTBRK	S	LPCS PUMP SUCTION VLV Q1E21F001-A CKT BRKR	NORMALLY OPEN MOTOR DRIVEN VALVE F001A FAILS CLOSED	Q			H2		
52-151113		CKTBRK		LPCS TEST BYPASS VLV Q1E21F012-A CKT BRKR		Q			L2		
52-151114	E21-CC-MVF005A-G	CKTBRK	S	LPCS INJECTN SHUTOFF VLV Q1E21F005-A CKT BRKR	REACTOR INJECTION MOTOR-OPERATED VALVE F005-A FAILS TO OPEN	Q			H2		
52-151134	E21-OC-MVF011A-G	CKTBRK	S	LPCS MINIMUM FLOW VLV Q1E21F011-A CKT BRKR	NORMALLY OPEN MOTOR DRIVEN VALVE F011A FAILS CLOSED	Q			H2		
5230		SUPPORT		LPCS LINE TO RPV , NUBBER		Q			H5		
5243		SUPPORT		LPCS LINE TO RPV , NUBBER		Q			H5		

Component	BE Name	Type	S	DESC	BE DESC	Q Code	Design Req	JUST	INIT Dis	Design Dis	PRA DIS
5268		SUPPORT		LPCS LINE TO RPV SNUBBER		Q			H5		
5287		SUPPORT		LPCS LINE TO RPV SNUBBER		Q			H5		
72-11A18		CKTBRK		PGCC PNL LPCS 1H13P629 & 1H13P736B CIRCUIT BREAKER		Q			H3		
72-11B35		CKTBRK		PGCC PNL 1H13P616 & 1H13P714E CIRCUIT BREAKER		Q			H3		
7373		SUPPORT		LPCS LINE TO RPV SNUBBER		Q			H5		
7425		SUPPORT		LPCS LINE TO RPV SNUBBER		Q			H5		
8098		SUPPORT		LPCS LINE TO RPV SNUBBER		Q			H5		

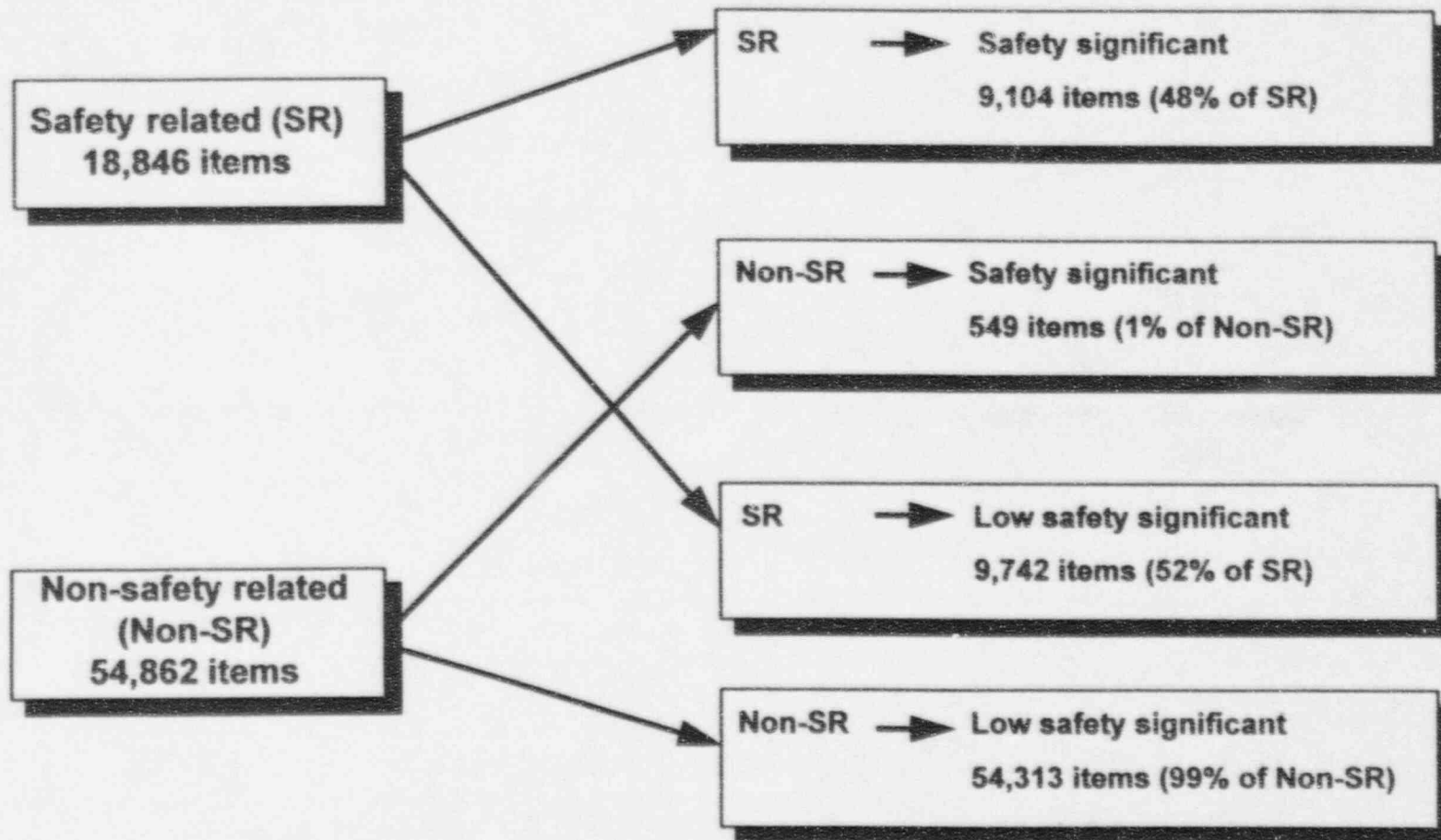
Component Level Evaluation*


Preliminary Results



*Component level evaluation performed for 24 systems at the Grand Gulf Nuclear Station

Q-List Restructuring Preliminary Overall Results



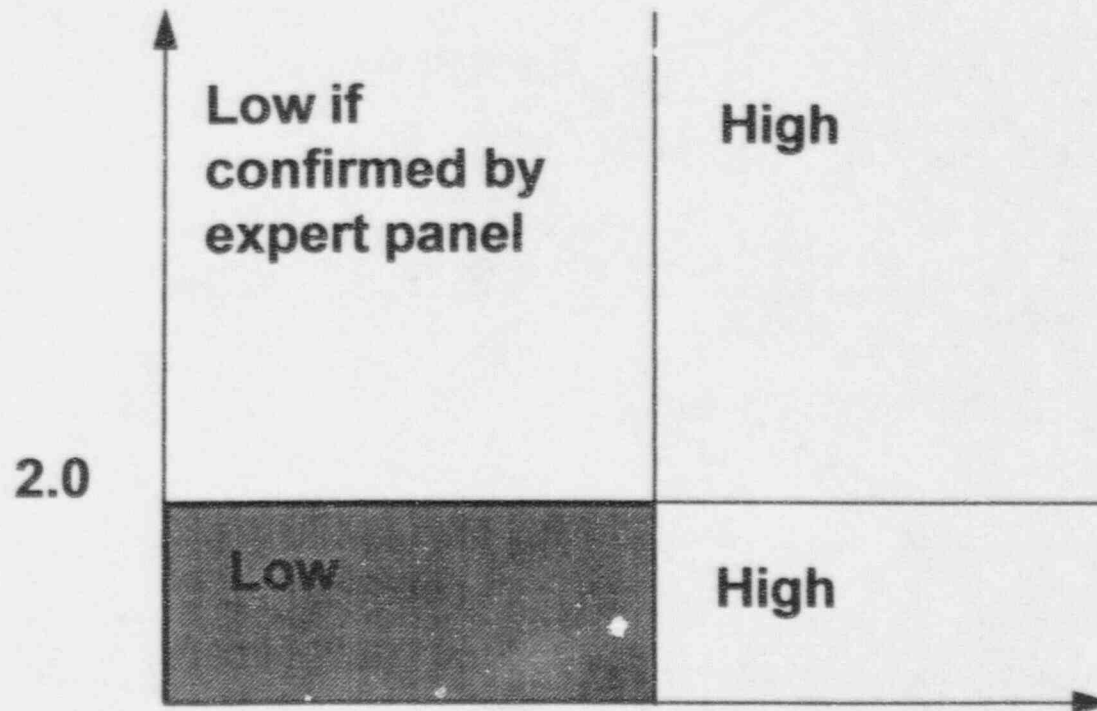


Component Level Evaluation Open Items

- ◆ **Unevaluated safety significant systems**
- ◆ **Consider revision to:**
 - **reduce overly conservative evaluations**
 - **“grade” selected safety significant components**
 - **apply calculated risk measures**

Potential Calculated Importance Measures


- ◆ Fussell-Vesely (Risk reduction) > 0.001
- ◆ Risk Achievement > 2.0





Progress To-Date

- **QA criteria for low safety significant components**



QA Criteria

Low Safety Significant Components

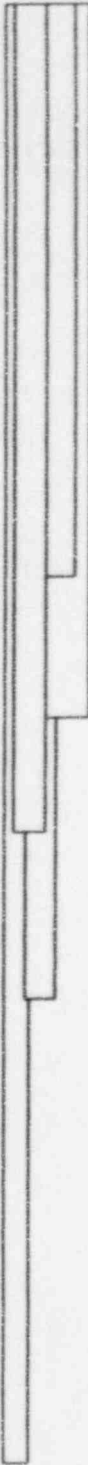
- ◆ **Bottom-up approach**
 - **Individual failures of low safety significant components (LSSCs) should, by definition, have no adverse effect on a function important to safety**
 - **Quality assurance controls that minimize such component failure rates should, therefore, add little value to safety**
 - **While the above is true for the vast majority of LSSCs, there are some valid (but narrow) concerns which should be addressed:**
 - **Mis-classified LSSCs (i.e., should really be safety significant)**
 - **LSSCs identical to safety significant components**
 - **Cumulative effect of LSSC failure**



QA Criteria


Mis-Classified LSSCs

- ◆ **Mistakes in classification will be rare due to overly conservative system and component classification criteria**
- ◆ **Changes in function (either through physical modification or procedure change) which cause the component to be safety significant will require a feedback loop into the Q-list**
- ◆ **In the unlikely case of a failure of a mis-classified component, the corrective action program must ensure the mis-classification is rectified**



QA Criteria Identical LSSCs/Safety Significant Components

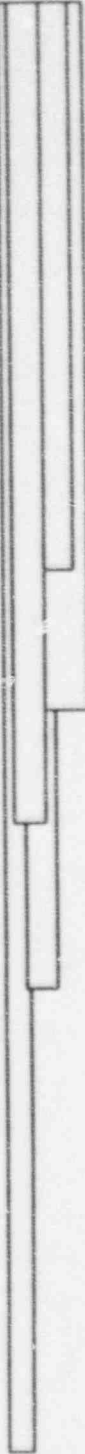
- ◆ **Concern is similar to common-cause or common-mode failure**
- ◆ **Will the corrective action for the LSSC failure be recognized as applicable to identical safety significant components?**
- ◆ **Corrective action program must ensure that generic applicability is considered**
- ◆ **Much of the concern is limited to initial period following graded QA implementation - as low safety significant components are replaced, their pedigree will no longer be identical to that of safety significant components**



QA Criteria

Cumulative Effect of LSSC Failure

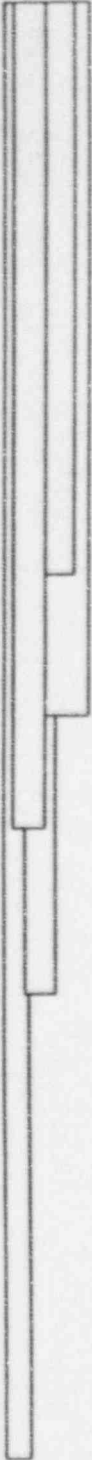
- ◆ While the cumulative safety effect of LSSC failure should be negligible if properly classified, it is prudent to confirm
- ◆ The quality assurance program should provide for periodic confirmation that reduced quality assurance for LSSCs has not resulted in an adverse effect on safety



Graded Procurement QA Criteria Changes for LSSCs

- ◆ **Reduced Scope QA**
 - **Elimination of vendor QA program requirements**
 - **Receipt inspector certification (via training, qual cards, etc.) rather than certification to ANSI 45.2.6**

- ◆ **Enhanced scope QA**
 - **Enhanced controls to ensure generic implications of LSSC failures are applied to identical SSCs**
 - **Periodic assessment of cumulative effect of increased LSSC failures and implementation of corrective action commensurate with safety importance of the cumulative effect**



Graded Procurement QA Criteria Changes for NS-Rs

- ◆ **Apply changes in a forward looking manner**
- ◆ **As components come up for replacement (and warehouse stock is depleted) NS-R components classified as safety significant will be procured in compliance with Appendix B**

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 dated 10/11/95.

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 safety¹.

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.

¹ 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.

This criterion requires grading.

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 Relationship
with
Non-Appendix B Requirements**



Requirements and Commitments

Graded QA:

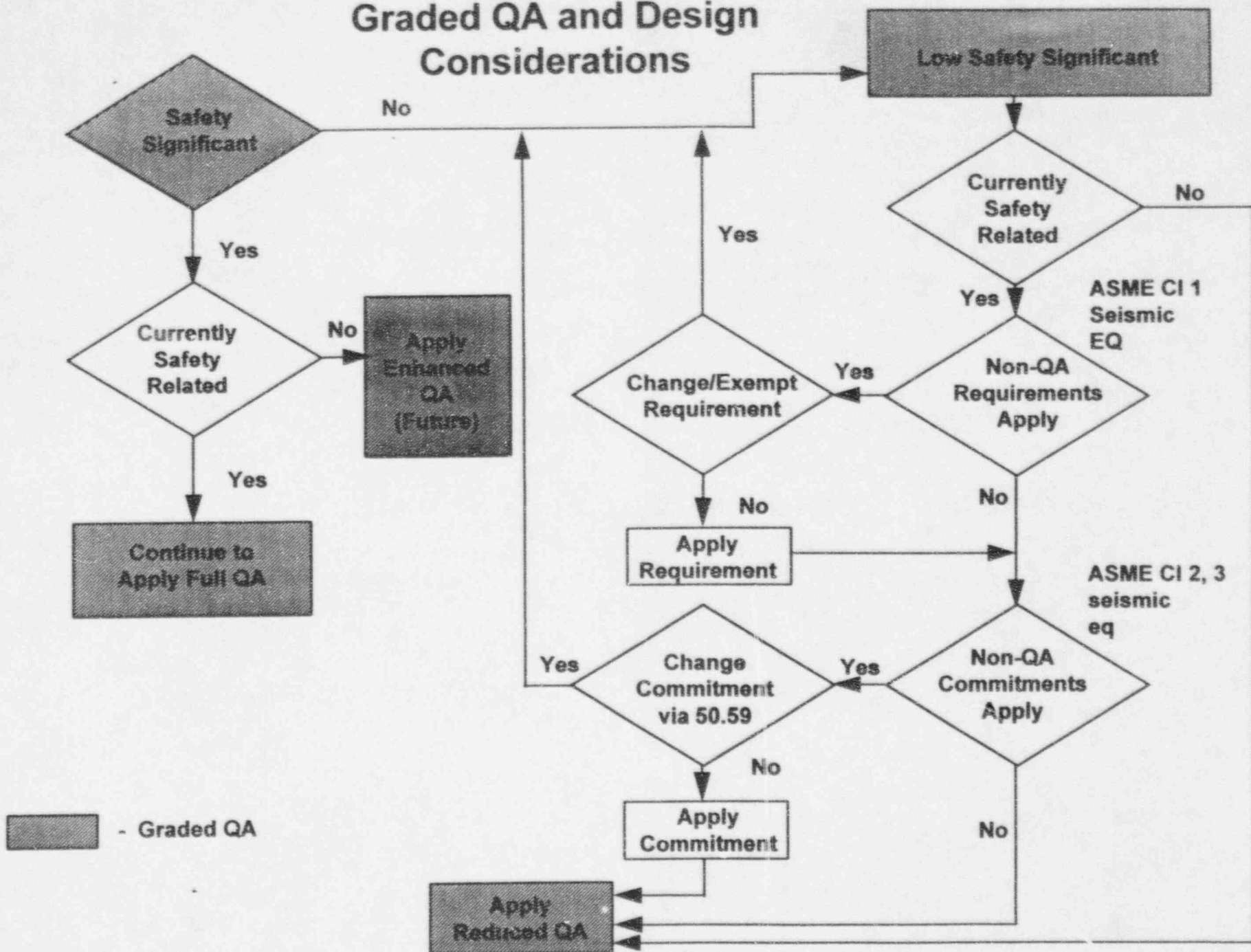
- ◆ **Applies Appendix B and associated commitments proportional to safety significance**
- ◆ **Does not relieve the licensee from compliance with regulations and commitments outside of Appendix B**




Graded QA/Design Criteria Relationship

- ◆ Graded QA and design criteria (e.g., requirements, codes, standards, etc.) overlap to some degree but, in general, are separate and distinct concepts
- ◆ Reduced quality assurance controls for LSSCs may, in some cases, be ineffective in achieving the goals of graded QA due to overly stringent design controls which remain
- ◆ To achieve the full benefit of graded QA (i.e., a reallocation of resources to focus on SSCs important to safety) it is necessary to also revisit our application of design criteria

Graded QA and Design Considerations





Example

Standby Liquid Control System

- ◆ **Graded QA viewpoint**

- **Judged by MR expert panel to be significant**
- **Not risk significant - i.e., ATWS contributes ~ 0.3% of total CDF**
- **Candidate for downgrading by graded QA expert panel**

- ◆ **Design viewpoint**

- **SLCS licensed as a seismic system**
- **Only function is ATWS - concurrent seismic event not credible**
- **Candidate for seismic downgrading under 10CFR50.59**



Example

Seismic Design Considerations

- ◆ Seismic design controls should be focused upon those systems necessary for safe shutdown during a seismic event
- ◆ Such systems represent somewhat less than half of the Grand Gulf safety significant systems
- ◆ As a “reduced scope” seismic IPEEE plant, Grand Gulf is exposed to relatively low seismic concerns
- ◆ In conjunction with the graded QA implementation, we will be critically examining seismic and other design considerations for potential changes under 50.59/50.90

10CFR21 and Graded QA

Purpose of 10CFR21:

Identify and disseminate information about basic component defects

Defect:

A departure from the technical requirements included in a procurement document that could create a substantial safety hazard

Relationship to Graded QA:

Assuming correct component categorization, deviations from procurement technical requirements for low safety significant components cannot create a substantial safety hazard



Application of 10CFR21

For identical components in safety significant vs. low safety significant applications:

- ◆ **The number of critical characteristics may vary (more critical characteristics for safety significant application)**
- ◆ **The level of control exerted over a single characteristic will vary (more stringent controls for safety significant application)**

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

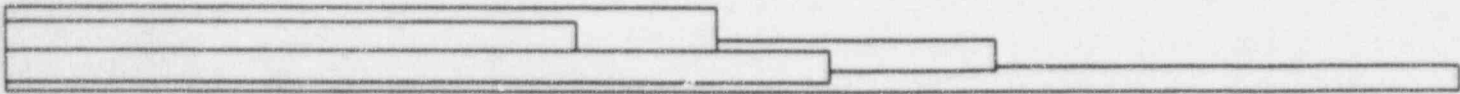
III. IDENTIFY APPLICABLE REQUIREMENTS AND COMMITMENTS (PER GES-04)

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

Role of the Expert Panel



Expert Panel

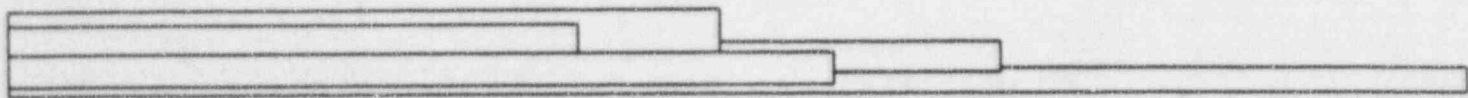
◆ Makeup

- Design Engineering
- Quality Assurance
- Licensing
- System Engineering
- Operations
- Others

◆ Role

- Validate Q-list criteria at system/component levels (done)
- Concur on QA criteria - 11/17/95
- Comment on process changes

NRC Participation





NRC Participation

- ◆ **We see benefit in moving beyond the traditional reviewer/licensee role, while maintaining appropriate regulatory distance**
- ◆ **Several recent efforts (e.g., Appendix J exemption/rulemaking) resemble a partnership effort with a common goal**
- ◆ **In this spirit, we urge the NRC to be an active participant in our development effort for graded QA**