

52-001



GE Nuclear Energy

To CHET POSLUSNY
NRC 11H3

Date 10 JULY 92

Fax No. _____

This page plus 31 page(s)

From JACK DUNCAN

Mail Code 754
175 Curtner Avenue
San Jose, CA 95125

Phone (408) 925-6947

FAX (408) 925-1193
or (408) 925-1687

Subject ABWR PRA PUNCH LIST

Message Updated punch list follows. Recently
submitted material is highlighted.
Please provide to NRC staff reviewers.
They should call the "GE Contacts"
or me if they believe the correct
status is not shown or to
indicate other problems.

280079
9207290035 920710
PDR ADDCK 05200001
A PDR

JACK
12050
1/1
Chet Poslusny

ABWR Tasks to wrap up PRA

DSER item	SSAR Section	Title Subtask	NRC Contact GE Contact	P	A	R	Next Date	Action Actor	Comments
				1	a	e			

Fault Tree Update (FT)

O-1		RPS Reliability	Kelly Raftery	v	s	n	n	n	GE Provided RPS fault tree to NRC 4/15. <u>Item Resolved</u>
n FT-1A		Update ECCS fault trees	Kelly Raftery	v	s		NRC ?		ECCS Trees sent to NRC 5/8.
n FT-1B		Update balance of trees	Kelly Raftery				NRC		Deferred to June to allow focus on more important items. <u>Provided to NRC 6/15</u>

Initiating Events (IE)

S-2		Defend IORV frequency	Kelly Raftery	v	n		GE	-	1. Use 0.1 in requantification	Staff requires use 0.1 event/year. GE accepts - <u>Item Resolved</u>
							GE	TBD	2 Reflect 0.1 in SSAR table and text	

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7/10/92

ABWR Tasks to wrap up PRA

DSEI item	SSAR Section	Title - Subtask	NRC Contact GE Contact:	P I a n	A n a l	T e v i e w	Next Date	Action Actor	Comments
C-1		IORV success criteria	Kelly Rafferty				NRC FBD	Review Response	Response sent to NRC 4/14. Kelly to confirm OK.
S-1	n	Defend one trip per year	Kelly Duncan	v	n	v	NRC TBD	Reflect agreement in SER.	NRC now agrees 1 trip/year as reasonable - <u>Item Resolved</u>

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				i	n	c			

O-2	10D.3.1.4	Evaluate support system failure on plant trips	Kelly Larson	v	s	s		NRC		GE has provided (Jan. 27) draft material (HVAC failure) and list of other support system to be addressed. GE agreed to staff request to add loss of single AC or single DC bus. GE also agreed to 4/9 staff request to also consider loss of TBCCW system and RPV water level instrument failure. Further discussions (4/14) suggest all areas resolved. Calculation deferred to incorporate in requantification (item PRA-1). FINAL Response provided to NRC 6/15.
							GE	Reflect update in SSAR		

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DSER item	SSAR Section	Title Subtask	NRC Contact GE Contact	P I n	A a l	R r i c w	Next Date Actor	Action	Comments
0-5	19D.3.1.5.3	Analyze interfacing LOCA	Kelly Larson	n			GE n	Document piping upgrade. Track Separately	Part of SSAR update in response to item 0-2. Response provided 6/15.
							NRC?	Revise SSAR text to reflect no need to analyze	

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ABWR Tasks to wrap up PRA

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				l	n	-			
O-4	19E.2.3.3	Outside containment LOCA	Paila Frederick Knecht Vishu	s			NRC ?	Review 5/4 material rapid feedback requested.	Further discussion held 4/15. GE/NRC/Brook- haven, resulting in GE agreement to Supplement SSAR 19E.2.3.3. 1) use Beta's from AIWE KAG 2) clarify conditional probabilities, 3) Explain how split fraction expansion factors, resistance coefficients and dP (t) were determined. Submitted 4/27. Preliminary NRC review indicates item resolved 5/4. Additional items discussed 6/5. Revision to bypass study submitted 6/4.

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ABWR Tasks to wrap up PRA

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				I	a	n			
				e	v	e			
				n	i	w			
1-1	19.9	Confirm site loss of AC, other site specific parameters	Kelly Raftery	s	v	n		Applicant action <u>Item resolved.</u>	SSAR text provided to NRC 6/30.
Success Criteria (SC)									
C-2		ATWS Success Criteria to prevent core damage	Kelly Buchholz	c	c	v	NRC ?	Reflect closure in FSER	Agreed SSAR treatment is adequate at San Jose 1/92 meeting. Documentation submitted 4/2/92. <u>Item Resolved</u>
n SC-1		ATWS RHIR Success Criteria	Kelly Buchholz	c	c	v	NRC ?	Reflect closure in FSER	Agreed SSAR treatment is adequate at San Jose 1/92 meeting. Documentation submitted 4/2/92. <u>Item Resolved</u>

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				i	n	e			
n SC-2	19.9	RWCU as DHR Success (ACRS)	Kelly Paradiso					NRC	Minor design modification. Kelly, Paradiso discussed 5/27. Details provided to IRC 6/4.
									SSAR text for COL action item submitted to NRC 6/90
		Failure Data							
C-3		Justify common cause failure data	Kelly Frederick					See item 9-5	

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DSER item	SSAR Section	Title Subtask	NRC Contact GE Contact	Plan a p	Responsible R i t c w	Next Date Actor	Action	Comments
0-5	19D.8	Justify train-level common cause approach is adequate	Kelly Rafferty			NRC ?	Tell GE if item is resolved.	For item C-3 and 0-5, NRC suggested requantify PRA without addressing CCF. then requantify CCF as sensitivity study as part of input to R+P (Item 1- 15). GE/NRC have agreed on which components to include. Submitted to NRC 5/30.
						GE	Document in SSAR	

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				l	a	n				
C-4A		Justify test/maintenance data analysis	Kelly Raftery				GE	n	Include new values in requantification: test and maintenance unavailability	Action plan discussed with NRC 3/24. T/M unavailabilities will be increased for utility flexibility. ECCS, RCIC RHR unavailability will be taken as 2%.
							GE	TBD	Reflect in SSAR	<u>Item Resolved</u>
C-4B		CDF sensitivity to outage times, surveillance intervals	Kelly Raftery				GE	TBD after 6/30 date = 7/15		New request by NRC. Mention no change in established BWR surveillance intervals, therefore sensitivity not investigated.
O-6	Tables 19D.6-2 and -3	justify RHR, HPCF pump failure probability	Kelly Raftery				GE	TBD	reflect justification in SSAR.	Justification provided 4/13 Raftery to Kelly. Justification accepted by NRC. <u>Item Resolved</u>

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				Issue Analysis Initiative	Next Action	Date	
O-21A	19.10	List systems not part of certified design, significant assumptions, assumed reliability	Palla Duncan				NRC Submitted to NRC as Section 19.10 on 6/27.
				GE	TBD	Update SSAR	
Level 1 PRA and Subsequent Related Studies (PRA)							
S-11		Fire water credit correction	Kelly Visweswaran	n	n	GE approach conservative. Fire water will be in KAP and as applicable in accident management. No other action needed. <u>Item Resolved</u>	
n PRA- 1A		Requantify level 1 PRA results (base case)	Kelly Raftery			NRC ?	Tabular results sent to NRC 5/22. CDF by initiator and accident class.
n PRA- 1B		Add comparison to operating BWRs, why sequence frequencies decrease	Kelly Raftery	GE	after 6/30 Date = 7/15	Provide comparison	New request by NRC, supports FSER A.2.1.1 will compare to Grand Gulf.

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ABWR Tasks to wrap up PRA

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				l	n	c				
n	PRA-2	Study of effect of instrumentation out of service	Kelly Rattery				GE	TBD. After 6/30	Provide results	Provide results if needed to support tech spec.
O-18A		Level I uncertainty analysis	Kelly Rattery	v			NRC			Results stop at CDF, will not be propagated through analysis. Item was late due to work on Flood PRA. New date = 5/19. Submitted 6/18.
O-11		Initiating Event uncertainty	Kelly Rattery							Address as part of item O-18A. Submitted 6/18.
I-15	19K	PRA input to Reliability Assurance	Kelly Larson	v			NRC			General agreement reached on how to proceed. Level I input provided 6/15. Balance submitted 6/29.

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				l	n	c				
n PRA-3	(19.8)	PRA input to ITAAC	n Duncan							NRC Preliminary submitted 5/30. Balance submitted as SSAR text 19.8 on 6/30
0-22A	(19.7)	PRA as a design tool	Kelly Duncan	v	s		GE	TBD	Reflect in SSAR	95% complete draft provided 4/7. NRC says good. <u>Item resolved</u> . 100% complete response sent to NRC 6/25. Pick up remaining items under 0-22B.
										NRC

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				l	a	e				
0-20	19Q	Shutdown risk. Four subtasks:	Kelly Vijweswaren	c	s				NRC agrees on 24 hour mission time.	
	Table 19.Q-1	1. ABWR design features					NRC ?		Sent to NRC 5/8.	
	Tables 19QB-1, -2	2. Review of past shutdown events					NRC ?		Sent to NRC 5/8.	
		3. Decay heat removal reliability					NRC ?		Submitted to NRC 6/30. Submitted to NRC 6/30.	
		4. Other tasks					NRC ?			

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ABWR Tasks to wrap up PRA

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				i	a	r				

Other Analyses (OA)

O-12	19M	Fire PRA	Kelly Raftery	c	c	s	NRC	6/12	Provide results of review to GE	No major items expected. Date slipped from 4/15. Maxwell/Kelly discussed questions 5/27. Lawrence Livermore review next.
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I-9	19R	Internal Flood	Kelly McSherry /Gokcek	s	s		NRC		Provide rapid feedback!	Approach outlined 3/24 San Jose. Partial draft provided 6/5. Discussion held 6/9.
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Submitted to NRC as Appendix 19R on 6/30.

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ABWR Tasks to wrap up PRA

DSER Item	SSAR Section	Title Subtask	NRC Contact GE Contact	P	A	R	Next Actor	Date	Action	Comments
				I	a	c				

Human Factors in PRA

C-5		These items are addressed by the following job subtasks:								Plan (Subtasks A,B, C, D) based on NRC/GE phone call 5 March 92 and discussions 25 March. Task E was added later.
O-7										
O-8										
O-9										
O-10										
I-2										
I-3										
I-4										
I-5										
I-6										
I-7										

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ABWR Tasks to wrap up PRA

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				l	a	e			
				n	l	i			
						e			
						w			
		A) Provide a list of references/general methods used to determine all failure probabilities. Reference to CESSAR. PRA is acceptable.	Beckner Frederick	v			NRC ?		Date shipped from 6/1 to 6/30 to focus on tasks B,C, D. Submitted to NRC 6/26.
		B) Conduct level 1 sensitivity study	Kelly Raftery	v			NRC ?		Increase sensitivity range if hard to document source of number. Sensitivity study submitted June 1.
	19D.7						GE	Document in SSAR	
	19D.7	C) Develop descriptions for most significant actions for input to control room design i.e. provide time available for operator action & signals that the operator relies on. Provides input to control room design & EPCs	Kelly Duncan	v			NRC ?		Descriptions submitted June 1 as part of item B response.

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ABWR Tasks to wrap up PRA

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				I	a	n				

D) Provide more specific references for operator actions identified as significant based on sensitivity study. References should include table and page numbers in references. Alternatively, use a wider range in performing the sensitivity study.

NRC ?

References provided June 1 as part of item 5 response

E) Add comparison of human error contribution to CDF compared to operating BWR.

Kelly
Frederick

GE TBD after 6/90
date: 7/90

New request by NRC to support ESER A.2.1.2 NUREG/CR-5527 LaSalle study is ref case.

Containment Event Trees (CET)

S-4	Staff estimates extra credit for vent in Class II internal event and seismic sequences	Kelly Buchholz	c s	GE	n	GE will take credit for vent in Level 1 requantification	<u>Item Resolved</u>
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ABWP Tasks to wrap up PRA

DSER item	SSAR Section	Title Subtask	NRC Contact CE Contact	P	A	R	Next Date	Action Actor	Comments
				l	n	e			
O-15		Treatment of Crywell -well bypass in GETs. This item is addressed by two sub tasks:							
		A) Design basis sensitivity studies	Kudrick Saxena						Tracked separately by Kudrick/Saxena
		B) Determine if GETs need to change to address bypass.	Palla/ Kudrick Buchholz				n	n	<u>GETs modified.</u> <u>Item resolved.</u>
O-17B		Modify GET for severe accident phen.	Palla Buchholz	c	c	c	n	n	<u>Item resolved.</u> individual issues considered in uncertainty analysis, O-18.

Backend Analyses (BA)

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ABWR Tools to wrap up PRA

DSER item	SSAR Section	Title Subtask	NRC Contact GE Contact	P	A	R	Next Actor	Date	Action	Comments
				I	a	n				
n BA-1	19F	Rearalysis of increased thickness drywell head ultimate capability	Bagchi Lin	c	c		GE	TBD	Reflect in SSAR	Includes uncertainty treatment. Analysis submitted 4/24. SSAR update after questions resolved. NRC responses to NRC questions provided 6/26.
n BA-2	19F	Service level C documentation	Bagchi Lin	c	c		GE	TBD	Reflect in SSAR	Should go in same place as 100% MWR. Analysis submitted 4/24. SSAR update after questions resolved.
							NRC		Address safety factor issue	Based on 6/8 meeting item seems resolved by subtasks A1-C7 below.

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ABWR Tasks to wrap up PRA

DSEI Item	SSAR Section	Title Subtask	NRC Contact GE Contact	Priority	Next Actor	Date	Action	Comments
		A) Determine 502F is reasonable temperature for assessment	Kudrick Suchholz		NRC			Kudrick to tell Bagchi for service level C. 6/22 call. JK says assume OK until heat differently.
		B) Provide analysis of screw head anchorage to show not bursting	Bagchi Liu		NRC		Review analysis	Analysis provided June 8. A.S. Liu to G. Bagchi
		C) Conclude service level C is satisfied.	Bagchi Liu		NRC			
C-6		Flashing during venting	Palla Suchholz		NRC	6/5	Review submittal	Analysis documented in 4/2/92 submittal to NRC and Catton (ACRS).
O-14		Justify aspects of OPPD (Rupture Disk Setpoint)	Palla Suchholz		NRC			Documentation submitted 6/30

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ABWR Tasks to wrap up PRA

USER SSAR Item Section	Title Subtask	NRC Contact	GE Contact	Next Actor	Date	Action	Comments
O-15	Net risk of passive flooders system	Palla Buchholz		NRC			Documentation submitted 6/30
O-16	CCT-credibility -A) Containment integrity	Palla Buchholz		NRC			GE has shown staff results. Staff concurred that vieward action does not pose a threat. Submitted 6/30.
	B) Source terms	Palla Buchholz					See uncertainty analysis

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ABWR Tasks to wrap up PRA

DSER Item	SSAR Section	Title Subtask	NRC Contact GE Contact	P I A n	A a f i c w	R r v t c w	Next Actor	Date	Action	Comments
O-17A		Modify CEFs for DCH, FCL, etc	Palla Buchholz	/	c	c	n	n		Individual issues treated in uncertainty analysis. Methods agreed. Item resolved.
O-18		Uncertainty analysis								
		A) Survey literature	Palla Buchholz	c	c	v	n	n		Item resolved per 5/26 phone call.
		B) Screen events for applicability to ABWR	Palla Buchholz	c	c	v	n	n		Item resolved per 5/26 phone call.
		C) Perform sensitivity studies	Palla Buchholz	v	c					Submitted 6/90.
		D) Derived DCH Uncertainty analysis	Palla/ Kudrich Buchholz	c	c	v	GE	7/15	Provide w/ documentation.	Documentation submitted 4/90. Discussed 6/15. Approach accepted. Minor comments to be resolved.

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ABWR Tasks to wrap up PRA

DSER Item	SSAR Section	Title Subtask	NRC Contact GE Contact	P	A	R	Next Actor	Date	Action	Comments
				i	n	e				
		E) Detailed CCI/Coolability Uncertainty analysis	Palla Buchholz	v	s	s	NRC			Submitted 5/30
		F) Cavity floor area (etc), Item 7 of 4/13/92 ACRS letter	Buchholz				NRC			Considered in coolability uncertainty analysis. Submitted 6/30
		G) Detailed bypass uncertainty analysis	Palla Buchholz				NRC			Discussed 6/12 Staff agreed methods and results reasonable. Submitted 6/30
n BA-3		Drywell Sump coolability	? CEB				GE	7/30	"Specs"	

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				n	a	c			
S-9		Rupture disk operation before 24 hours not cont failure	Palla Buchholz				NRC	Reflect agreement in FSER.	NRC agrees rupture disk operation is not containment failure. <u>Item Resolved</u>
S-12		ATWS treatment by NRC	Palla Buchholz				NRC	Reflect closure in FSER	NRC agrees GE approach conservative, no other impacts. <u>Item Resolved</u>
NRC Additions (NRC)									
NRC I	Chapter 22	Severe Accident Closure	Kutrick Buchholz	c	c		NRC ?	Write section. Inform GE if more info needed beyond that identified in 2/20 submission.	FCI questions expected.

CETs submitted
6/30 contain
information.

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ABWR Tasks to wrap up - RA

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				l a n	n a l	c i e w			
NRC- 2		Accident management	Palla Buchholz	s	c	v	NR	6/5	Early review is positive. BNL review in progress. 6/5 NRC wants more.
NRC- 3		SAMDA Submittal	Palla? Quirk				GE	TBD not req'd. before 6/30.	Need the dose table for EPZ simplification.

Need more discussion. NRC action required

Seismic Analysis Beyond Design Base (SA)

S-5	19H5	Fuel assembly capacity	Kelly Liu	v		GE	Update SSAR	NRC, GE have agreed to 1.2g. <u>Item resolved</u>
S-6	19H5	Flat-bottom tank capacity	Kelly Liu	v		GE	See Margins Analysis (SA-2)	
S-7	19H5	Diesel generator capacity	Kelly Liu	v		GE	Margins Analysis	
S-8	19H5	Electrical equipment capacity	Kelly Liu	v		GE	Margins Analysis	

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ABWR Tasks to wrap up PRA

DSER item	SSAR Section	Title Subtask	NRC Contact GE Contact	P A R			Next Date	Action	Comments
				l	n	c			
I-14	19H5	Confirm electrical equipment capacities in site specific PRA	Kelly Duncan	v			GE	Margins analysis	Site specific PRA not required Capacities used in margins analysis will be COL applicant action.
O-21B	19-10	Seismic capacities for systems not in certified design	Paola Duncan	v			NEC		Addressed by SSAR text 19.10, submitted 6/27.
S-10	n	Staff will use LLNL hazard curve	Kelly Duncan	--	--	--	n	n	Seismic PRA not required. <u>Item resolved</u>
n	n	How to treat seismic hazard uncertainties	Kelly Duncan	--	--	--	n	n	Not required. <u>Item resolved</u>
I-10	19-9	Confirm assumed seismic capacities and incorporate in design specs	Kelly Duncan	v			GE		Addressed by SSAR text 19-9, submitted 6/30.
I-11	n	Modify seismic PRA to account for soil failures	Kelly Duncan	--	--	--	n	n	Seismic PRA not required. NRC may address by site licensing requirement. <u>Item Resolved</u>

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ABWR Tasks to wrap up PRA

DSER item	SSAR Section	Title Subtask	NRC Contact GE Contact	P A R			Next Actor	Date	Action	Comments
				l a n	n a i e w	e				
I-12	19.9	Plant walkdown by applicant	Kelly Duncan	---	---	n	n	n	GE agrees to plant walkdown per EPRI NP- 6041 <u>Item resolved</u> Addressed by SSAR text 19.9, submitted 6/30	
I-13	n	Site specific seismic PRA by applicant	Kelly Duncan	---	---	n	n	n	Seismic PRA not required. NRC may address by site licensing requirement. <u>Item Resolved</u>	
O-19	19E.2.3.3,4	Address potential for penetration, isolation valve failure during seismic event	Palla Knecht	v			NRC ?	Review 6/4 submittal. Rapid feedback requested.	Proposed approach provided to NRC Dec. 91, Jan. 92 Next: incorporate seismic into bypass study. <u>Revision to bypass study submitted 6/4.</u>	

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ABWR Tasks to wrap up PRA

DSEK item	SSAR Section	Title Subtask	NRC Contact GE Contact	F A R			Next Actor	Date	Action	Comments
				l	n	c				
S-3		Correct the treatment of firewater in Seismic Class II CET	Kelly Vishu	v		n			CETs not needed in margins analysis submitted 6/26.	
n SA-2		Margins analysis	Kelly Frederick				NRC	>	Submitted 6/26, including seismic capacities for applicant to check (see SSAR 19.9)	
							GE	TBD	Reflect margins analysis in SSAR	
							NRC	?	New words. So HCLPF does not become design value. Achievable, but not a requirement.	Probably no practical impact.

Other External Hazards

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ABWK Tasks to wrap up PRA

DSER item	SSAR Section	Title Subtask	NRC Contact GE Contact	F	A	R	Next Actor	Date	Action	Comments
				l	a	n				
1-8	n	Site specific design verification: external floods, transportation hazards	Reilly Duncan				NRC	6/92	NRC will probably address as supplement to SER. Guidance to applicant.	"Grandchild" of SECY 016 due about June. Classic design analysis alone may be sufficient. Probably no action by GE.

Interfaces (General) (IN)

n	IN-1	19.9 19.10	Be sure PRA "requirements" and insights get into "Interface write up"	s			GE			GE believes 19.9, 19.10 address this issue.
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Consequence Analysis (CA)

n	CA-1		No NRC feedback on site acceptability. Appendix 2A	Palla Careway			NRC		Reflect agreement in FSER	Palla/Careway discussed 4/2. NRC agrees. <u>Item Resolved</u>
							GE	TBD	Reflect corrections in SSAR.	Corrections submitted 6/29

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ABWR Tasks to wrap up PRA

DSEI Item	SSAR Section	Title Subtask	NRC Contact GE Contact	P	A	R	Next Actor	Date	Action	Comments
				I	n	c				
				n	I	c				
n	n	Reflect corrected CRAC/weather treatment in consequence analysis.	? Careway	n	n	n	n	n	n	Correction made. <u>Item resolved</u>
n	19E.3	New consequence analysis for PRA	Falla Careway				NRC			Need NRC agreement on CETs mid June to make this date. <u>Submitted 6/30</u>
n	19E.3	New consequence analysis for EPZ	? Careway				NRC		<u>Reflect agreement in FSER.</u>	<u>Submitted 6/30</u>
n	19P	Appendix 19P (50.34f design mods) update.	Falla Knecht				NRC			<u>Submitted 6/30</u>

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