File No: 009-0PS92-166 Revision: 00 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

Southern California Edison PLANT: San Onofre 2&3 CLIENT: C-E JOB NUMBER: 2001216 **PROJECT:** ISOPS II Support

DOCUMENT: Module 03 Group 06 Engineering Limit and Bases

PARAMETER: COLD LEG TEMPERATURE

PREPARED BY:	Paul B. Kramarchyk	
	Cognizant Engineer (Print Name)	. .
	Paul B. Kramarshyk Cognizant Engineer Signature)	Date: 11 23 92
	Cognizant Engineer Signature)	

VERIFICATION STATUS: COMPLETE

Cogniz

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists 9 of QAM-101. Design Review using Checklists ____ of QAM-101.

STEVEN C RYDER Name Independent Reviewer

Signatur

Cognizant Engineering Manager (Print Name) Engineering Manager (Signature)

APPROVED BY:

File No: 009-OPS92-166 Revision: 00 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 03 Group: 06

Parameter: COLD LEG TEMPERATURE

Step Value(s): Use(s):

ALL < 470°F To verify criteria for letdown restoration is met (Tc < 470°F).

Engineering Limit(s):

HIGH LIMIT less than 494°F

Bases for Engineering Limit(s):

Less than 494°F is based on engineering judgement. The rational is:

Restricting RCS cold leg temperature to less than 494°F will prevent exceeding the design pressure for the intermediate pressure letdown piping.

Intermediate Pressure Letdown Design Data:Design pressure:650 psi(ref. 1)Design temperature:550°F(ref. 1)

Saturation temperature for 650 psia is 494.89°F (ref. 2).

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Assumptions: None

References:

- 1) SONGS P&ID, REACTOR COOLANT CHEMICAL AND VOLUME CONTROL SYSTEM, DWG #40123B-21 (coord. C-7)
- 3) ABB STEAM TABLES, pg. 12 SEVENTEENTH PRINTING

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL OAM-101

QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: 009-01592-166 Rei 00

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda properly identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- 7. Have the design interface requirements been satisfied?
- 8. Was an appropriate design method used?
- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required application?
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair?
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant IIIe?
- 16. Has the design properly considered radiation exposure to the public and plant personnel?

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17.	Are the acceptance offerts incorporated in the design documents sufficient to allow verification that design requirements have been satisfactority accomplished?		- 1
18	Have adequate pre-operations! and subsequent periodic test requirements been appropriately specified?		ا د
ģ	Are adequate handling, storage, cleaning and shipping requirements specified?		1
8	Are adequate identification requirements specified?		2
21.	Has an appropriate this page been used?	3	
ର୍ଷ	Are all pages sequentially numbered and marked with a valid number?	7	

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> Are requirements for record preparation review, approval, retention, etc., adequately apecified? ĸ

Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?

is the presentation legible and reproducible?

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Checklast I was not applicable & this univers Comments/Remarks: --

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111/2/92 0 Hace RYDER C STEVEN

Independent Reviewer. Name/Signature/Date

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EXHIBIT 3.10-1

File No: 009-OPS92-165 Revision: 00 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 03 Group 07 Engineering Limit and Bases **PARAMETER:** COLD LEG TEMPERATURE (1A, 1B, 2A, 2B)

PREPARED BY:	Paul B. Kramarchyk	
	Cognizant Engineer (Print Name)	i i
	Paul & Kramareligh	Date: 11 24 92
	Cognizant Engineer (Signature)	

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists 9 of QAM-101.

Kenneth E. Faulkner Name Independent Reviewer

Kenneth E. Fault Signature

11/27/92

APPROVED BY: Cognizan ng Manager (Print Name) Cogniz gineering Manage (Signature)

File No: 009-0PS92-165 Revision: 00 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 03 Group: 07

Parameter: COLD LEG TEMPERATURE (1A, 1B, 2A, 2B)

Step Value(s): Use(s):

LOWEST LOOP TC To determine which cold leg has the lowest (1A,1B,2A,2B) delta T with respect to S/G temperature (S/G temp - Tc), to determine which RCP should be started first.

Engineering Limit(s):

None

Bases for Engineering Limit(s):

There are no associated engineering limits for the comparison of parameters. Since no value is specified in the comparison, no value will be assigned to the engineering limit.

"LOWEST LOOP Tc" is a comparative value. Therefore, an engineering limit is not assigned.

Assumptions: None

References: None ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: Mod. 3 Group 7 Cold Legtenperature/ 009-08592-165/Rev. DO-

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda properly identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- 7. Have the design interface requirements been satisfied?
- 8. Was an appropriate design method used?
- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?
- 10. is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required application?
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair?
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant IIIe?
- 16. Has the design properly considered radiation exposure to the public and plant personnel?

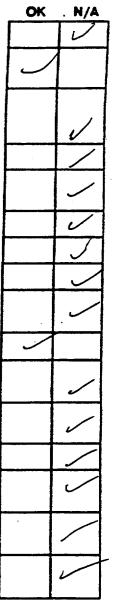


EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL OAM-101

QAP 3.1 REVISION PAGE 5 OF

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- 17. Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?
- 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified?
- 19. Are adequate handling, storage, cleaning and shipping requirements specified?
- 20. Are adequate identification requirements specified?
- 21. Has an appropriate title page been used?
- 22. Are all pages sequentially numbered and marked with a valid number?
- 23. Is the presentation legible and reproducible?
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
- 25. Are requirements for record preparation review, approval, retention. etc., adequately specified?

Comments/Remarks: None, Checklist 1 is N/A,

Kenneth E. Faulkner / Kenneth E. Faulkner / 11/27/92

Independent Reviewer: Name/Signature/Date

File No: 009-0PS92-164 Revision: 00 1 of 2 Page:

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

San Onofre 2&3 PLANT: Southern California Edison CLIENT: C-E JOB NUMBER: 2001216 ISOPS II Support PROJECT:

DOCUMENT: Module 03 Group 08 Engineering Limit and Bases PARAMETER: COLD LEG TEMPERATURE (1A, 1B, 2A, 2B)

PREPARED BY:	<u>Paul B. Kramarchyk</u> Cognizant Engineer (Print Name)	
	Paul B. Knownedyk	Date: 1130 92
	Cognizant Engineer (Signature)	

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists 9 of QAM-101.

Kenneth E. F. Kner Name

Signature

Independent Reviewer

ring Manager (Print Name) Cognizant In Engineering Manager (Signature) Dáte Cogniz

APPROVED BY:

File No: 009-OPS92-164 Revision: 00 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 03 Group: 08

Parameter: COLD LEG TEMPERATURE (1A, 1B, 2A, 2B)

Step Value(s): Use(s):

< S/G E-088 To identify the most affected S/G.

TEMP

< S/G E-089 To identify the most affected S/G. TEMP

Engineering Limit(s):

None

Bases for Engineering Limit(s):

There are no associated engineering limits for the comparison of parameters. Since no value is specified in the comparison, no value will be assigned to the engineering limit.

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"Less than steam generator E-88 (89)" is a comparative value. Therefore, an engineering limit is not assigned.

Assumptions: None

References: None ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL OAM-101 QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: Mod. 3 Group 8 Cold Leg Temperature / 009-08592-164 / Rev. DO

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?
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- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?
- 16. Has the design properly considered radiation exposure to the public and plant personnel?

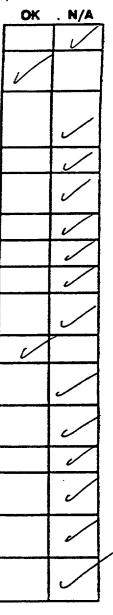


EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL OAM-101

QAP 3.1 REVISION PAGE 5 OF

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- 17. Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?
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23. Is the presentation legible and reproducible?

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- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
- 25. Are requirements for record preparation review, approval, retention. etc., adequately specified?

Comments/Remarks: As marked on Document Comments Sheet.

Kenneth E. Faulkner/Kenneth E. Faulkner / 12/1/92

Independent Reviewer: Name/Signature/Date

Checklist

File No: 009-OPS92-168 Revision: 01 Page: 1 of 3

Date

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 03 Group 09 Engineering Limit and Bases

PARAMETER: COLD LEG TEMPERATURE

Paul B. Kramarchyk PREPARED BY: Cognizant Engineer (Print Name) Date: 7 Cognizant Engineer (\$ignature)

<u>VERIFICATION STATUS: COMPLETE</u> The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $\frac{N > 7}{\sqrt{2}}$ of QAM-101.

Name S Independent Reviewer

MARTIN CREER

Signature

Independent Reviewer

APPROVED BY:

ng Manager (Print Name) Cognizant Engineer Cognizant Engineering Manager (Signature)

File No: 009-OPS92-168 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 03 Group: 09

Parameter: COLD LEG TEMPERATURE

Step Value(s): Use(s):

>=SDM REQUIREMENT To ensure RCS temperature is equal to or greater than the temperature required for shutdown margin based on last boron sample.

Engineering Limit(s):

Tcold limit is per: SONGS Surveillance Operating Instructions, SO23-3-3.29, Calculation of SDM Boron Concentration Using Curves - Plant Heatup Or Cooldown (reference 1)

Bases for Engineering Limit(s):

The limiting temperature is a function of the current boron concentration, the method used to calculate SDM, and the current plant physics condition.

<u>NOTE</u>: Plant physics curves that rely on real-time RCS temperature as a coordinate should be adjusted for instrument uncertainties.

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Assumptions:

The stated limit assumes the SDM is calculated per ref. 1 and 2.

In accordance with NES&L Quality Procedure S023-XXVV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1, 2

References:

- 1) SONGS SURVEILLANCE OPERATING INSTRUCTIONS, SO23-3-3.29 ATTACHMENT 8, REV. 6 CALCULATION OF SDM BORON CONCENTRATION USING CURVES -PLANT HEATUP OR COOLDOWN
- 2) OPERATIONS PHYSICS SUMMARY SONGS UNIT 2 CYCLE 6, M38100 REV. 25 FIGURE 2.2 MINIMUM BORON TO ASSURE SHUTDOWN MARGIN

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL OAM-101

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checidist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checidist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision:

009-0P592-168 Revo

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- 8. Was an appropriate design method used?
- 9. Here the adjustment factors, uncertainties, and empirical correlations been correctly applied?
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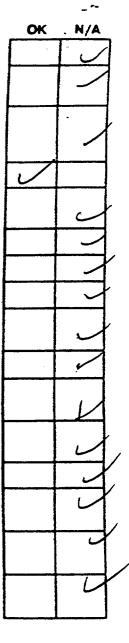


EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL NOWN BOVEN QAM-101

QAP 3.10 REVISION 1 PAGE 5 OF 5

009-0P592-168 Rev\$1 oK 17. Are the acceptance oritoria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished? 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified? Are adequate handling, storage, cleaning and shipping requirements specified? 19. Are adequate identification requirements specified? 20. 21. Has an appropriate title page been used? 22 Are all pages sequentially numbered and marked with a valid number? 23. is the presentation legible and reproducible? 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change? 25. Are requirements for record preparation review, approval, retention. etc., adequately specified? Comments/Remarks:

MARTIN CREER/Marta Suc. Independent Reviewer: Name/Signature/Date 4/16/42

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009-0PS92-089 File No: Revision: 03 1 of 12 1/24/43 Page:

ABB COMBUSTION ENGINEERING INSTRUMENT USE AND BASES TABLE COVER SHEET

San Onofre 2&3 Southern California Edison PLANT: CLIENT:

ISOPS II Support PROJECT:

C-E JOB NUMBER: 2001216

Containment Emergency Sump Level MODULE: 04 Containment H/R Radiation Level Containment Hydrogen Concentration Containment Humidity RWST Level

PREPARED BY:

L.A. Wild Cognizant Engineer (Print Name) Date: 4/28/93 Cognizant Engineer (Signature) VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $\frac{N_0 \ 9}{2}$ of QAM-101.

MARTIN GRAAR Na Signature Date Name Independent Reviewer

J.R. Congdon APPROVED BY: Cognizant Engineering Manager '(Print Name) Engineering Manager (Signature) Cognizant

 File No:
 009-0PS92-089

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RECORD OF REVISIONS

Rev	Date	Pages	Prepared by	Reviewed	Approved by
00	11/02/92	ALL	L.A Wild	P.B.Kramarchyk	J.R.Congdon
01	11/19/92	3,4,5	L.A.Wild	S.C.Ryder	J.R.Congdon
02	01/12/93	9,10	L.A.Wild	J.Flaherty	J.R.Congdon
03	04/28/93	5,8	L.A.Wild	J.Flaherty	J.R.Congdon

DOCU PAGE	MENT NO: 009-0PS92-089 NO: 3 OF 10	. *	SONGS 2/3 ISOP II PHASE II Instrument use and bases table	DATE: 04/29/93 REVISION: 03
<u>Q.A.</u>	APPROVED TABLE		Module #: 04	Q.A. APPROVED TABLE
GRP	PARAMETER	STEP VALUE/ ENG. LIMIT	BASES	USE
01	CONTHT EMERG SUMP LEVEL	 > 18 FT 8 IN LL 18.359 FT 	Based on ensuring that the level in the CONTNT EMERG SUMP will provide sufficient NPSH for the CS and HPSI pumps after shutting the RWST isolation valves. The limit is conservative based on assumed pump combinations, flow rates and head losses.	To determine if adequate level exists in the Containment Emergency Sump (e.g. 18 feet 8 inches) to supply the Containment Spray Pumps.
01	CONTHT EMERG SUMP LEVEL	 > 18 FT 8 IN LL 18.359 FT 	Based on ensuring that the level in the CONIMI EMERG SUMP will provide sufficient NPSH for the CS and HPSI pumps after shutting the RWSI isolation valves. The limit is conservative based on assumed pump combinations, flow rates and head losses.	To verify proper conditions exist prior to isolating the RWST following a RAS.
02	CONTHT ENERG SUMP LEVEL	RISING NONE 	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To verify the emergency sump level increases as the RWST level decreases.
02	CONTAT EMERG SUMP LEVEL 😕	RISING NONE	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To verify RWST is feeding SI, which is spilling onto the containment floor.
50	CONTAT EMERG SUMP LEVEL	RISES NONE	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To verify the emergency sump level increases as the RWST level decreases.
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Second Anna Sa DOCUMENT NO: 009-0PS92-089 SONGS 2/3 ISOP 11 PHASE 11 PAGE NO: 4 OF 10 INSTRUMENT USE AND BASES TABLE Q.A. APPROVED TABLE Module #: 04 Q.A. APPROVED TABLE STEP VALUE/ GRP PARAMETER ENG. LIMIT BASES USE 03 1 CONTMT EMERG SUMP LEVEL NORMAL There are no engineering limits for the trending or To determine if containment conditions indicate an NONE monitoring of parameters. Since no value is specified event other than SGIR is in progress. in the trend, no engineering limits apply.

CONTHT EMERG SUMP LEVEL NOT RISING There are no engineering limits for the trending or 04 To verify Containment Emergency Sump not rising and NONE monitoring of parameters. Since no value is specified re-diagnose the event if it is. in the trend, no engineering limits apply. There are no engineering limits for the trending or 04 CONTMT EMERG SUMP LEVEL NOT RISING To determine that Containment Emergency Sump level is NONE monitoring of parameters. Since no value is specified not rising as RWST level decreases and evaluate methods in the trend, no engineering limits apply. to maintain RWST level > 19%. 05 CONTINT EMERG SUMP LEVEL NOT RISING There are no engineering limits for the trending or To verify conditions inside containment to be normal. NONE monitoring of parameters. Since no value is specified in the trend, no engineering limits apply. 3 06 I CONTHT EMERG SUMP LEVEL > 17. FT Based on ensuring that the level in the CONTMI EMERG To ensure adequate ECCS inventory in the Containment SUMP will provide sufficient NPSH for the CS and HPSI LL 18.359 FT Emergency Sump if RWST level is below the RAS setpoint. pumps after shutting the RWST isolation valves. The limit is conservative based on assumed pump combinations, flow rates and head losses.

DATE: 04/29/93 **REVISION: 03**

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	IENT NO: 009-0PS92-089 NO: 5 OF 10		SONGS 2/3 ISOP 11 PHASE 11 Instrument use and bases table	DATE: 05/05/93 REVISION: 03
<u>A.</u>	APPROVED TABLE		Module #: 04	Q.A. APPROVED TABLE
Ρ	PARAMETER	STEP VALUE/ Eng. Limit	BASES	USE
11	CONTMT H/R RAD MONITORS	< 40 R/HR LL 20 R/HR	This limit is based on engineering judgement. In the event of a LOCA in containment, 20R/HR is > the expected dose rate, assuming 100% realease of maximum RCS activity. This would be indication that some fuel failure had occurred with the LOCA.	To evaluate initiating CSAS for iodine removal if containment High Range Area Radiation Monitor is NOT reading < 40R/HR.
) 1	CONTMT HUMIDITY	NOT RISING None	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	 To verify conditions inside containment to be normal.
) 1	CONTMT HYDROGEN CONC	< 0.5% LL 0% UL 4%	The LL is based on keeping the H2 concentration as low as possible by placing the H2 recombiners in service when it is first detected. The UL is based on ensuring that a H2 burn or explosion does not take place when the recombiner is placed in service.	To determine if the hydrogen recombiners need to be operating (H2 concentration > or = 0.5%).
) 2	CONTMT HYDROGEN CONC	< 4% < 4% 	<pre>4% is based on the flammability limit of hydrogen in dry air. Energizing the recombiners when hydrogen concentration is <= 2% ensures that the hydrogen concentration will not reach 4%. 4% is also the limit at which the recombiners must be secured.</pre>	To determine if containment hydrogen concentration is Low enough to permit energization of the hydrogen recombiners (< 4%).
03	CONTMT HYDROGEN CONC	< 4% 4% 	4% is based on the flammability limit of hydrogen in dry air. Energizing the recombiners when hydrogen concentration is <= 2% ensures that the hydrogen concentration will not reach 4%. 4% is also the limit at which the recombiners must be secured.	To determine if the present CG control success path is adequate (hydrogen < 4%) or a different one must be used.

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DOCUMENT NO: 009-0PS92-089 PAGE NO: 6 OF 10

Q.A. APPROVED TABLE

SONGS 2/3 ISOP 11 PHASE 11 INSTRUMENT USE AND BASES TABLE

Module #: 04

Q.A. APPROVED TABLE

GRP	PARAMETER	STEP VALUE/ ENG. LIMIT	BASES	l USE
03	CONTNT HYDROGEN CONC	< 4X 4X	4% is based on the flammability limit of hydrogen in dry air. Energizing the recombiners when hydrogen concentration is <= 2% ensures that the hydrogen concentration will not reach 4%. 4% is also the limit at which the recombiners must be secured.	To determine if the hydrogen concentration requires the operator to go to the Functional Recovery EOI (>4%).
03	CONTMT HYDROGEN CONC	< 4% 4%	4% is based on the flammability limit of hydrogen in dry air. Energizing the recombiners when hydrogen concentration is <= 2% ensures that the hydrogen concentration will not reach 4%. 4% is also the limit at which the recombiners must be secured.	To determine if hydrogen concentration requires the event to be re-diagnosed (>=4.0%).
04	CONTHT HYDROGEN CONC	< 0.5% 0%	0% (actual) hydrogen is the normally expected concentation in containment. An event resulting in an increase in hydrogen concentration above the minimum detectible level (0.5%) is indication that an event other than a LOFW (i.e. LOCA) is occurring.	To confirm that an event other than an LOFW is not taking place.
05 	CONTHT HYDROGEN CONC	< 2% 3.5% 	3.5% is based on a design requirment that a single train of hydrogen removal equipment will be able to remove hydrogen at a rate such that actuation of the system is not required until hydrogen is within 0.5% by volume of the flammability limit (4.0%).	To determine if use of the Hydrogen Recombiners is required to satisfy the present combustible gas (CG) control success path.

DATE:

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DATE: 04/29/93 REVISION: 03

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DOCUMENT NO: 009-0PS92-089 PAGE NO: 7 OF 10 •

SONGS 2/3 ISOP II PHASE II INSTRUMENT USE AND BASES TABLE

DATE: 04/29/93 REVISION: 03

Q.A. APPROVED TABLE

Module #: 04

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Q.A. APPROVED TABLE

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GRP	PARAMETER	STEP VALUE/ ENG. LIMIT	BASES	U\$E
06	CONTHT HYDROGEN CONC	< 2X 3.5X	3.5% is based on maintaining the containment hydrogen concentration below the flammability limit (4%). The Hydrogen Purge system is only used if the recombiners fail. In this case, starting to purge at 3.5% will maintain the hydrogen concentration < 4%.	To evaluate the need to continue hydrogen purge operation.
06	CONTMT HYDROGEN CONC	> 2X 3.5X	3.5% is based on maintaining the containment hydrogen concentration below the flammability limit (4%). The Hydrogen Purge system is only used if the recombiners fail. In this case, starting to purge at 3.5% will maintain the hydrogen concentration < 4%.	To evaluate the need to continue hydrogen purge operation.
06	CONTHE HYBROGEN CONC	< 4X 3.5X	3.5% is based on maintaining the containment hydrogen concentration below the flammability limit (4%). The Hydrogen Purge system is only used if the recombiners fail. In this case, starting to purge at 3.5% will maintain the hydrogen concentration < 4%.	To evaluate the need to continue hydrogen purge operation.
06 	CONTINT HYDROGEN CONC	< 2X 3.5X	3.5% is based on maintaining the containment hydrogen concentration below the flammability limit (4%). The Hydrogen Purge system is only used if the recombiners fail. In this case, starting to purge at 3.5% will maintain the hydrogen concentration < 4%.	To determine if use of the Hydrogen Purge System is required to satisfy the present CG control succes path.
07 	CONTINT HYDROGEN CONC	RISING NONE	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To evaluate the need for hydrogen purge of containment.

DOCUMENT NO: 009-0PS92-089 PAGE NO: 8 OF 10

SONGS 2/3 ISOP 11 PHASE 11 INSTRUMENT USE AND BASES TABLE

DATE: 04/29/93 **REVISION: 03**

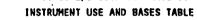
Q.A. APPROVED TABLE

Q.A. APPROVED TABLE

Module #: 04

STEP VALUE/ GRP PARAMETER ENG. LIMIT BASES USE 01 | RWST LEVEL < 19% The UL ensures that sufficient volume is transferred To verify RWST-level < RAS accuation set point (19% UL=26.8%,LL=11.0% | from the RWST and that 20 min of volume remains in the specified in EOIs). RWST prior to RAS. The LL ensures that sufficient volume remains in RWST to prevent air entrainment during transfer from RWST to Contmt sump. > 19% 01 | RWST LEVEL The UL ensures that sufficient volume is transferred To verify RWST level is above the RAS actuation UL=26.8%,LL=11.0% from the RWST and that 20 min of volume remains in the setpoint (19% specified in EOIs). RWST prior to RAS. The LL ensures that sufficient volume remains in RWST to prevent air entrainment during transfer from RWST to Contmt sump. > 2% 02 | RWST LEVEL The lower limit of > 4.65% is based on ensuring that To determine when charging pump suction should be LL >4.65% the RWST has sufficient inventory to provide a source transferred to another borated water source, or to of water to the suction of the charging pumps. The determine that they should be stopped. level specified is expressed as a percent of tap to tap span. 3 There are no engineering limits for the trending or To verify the emergency sump level increases as the FALLING 03 | RWST LEVEL RWST level decreases. NONE monitoring of parameters. Since no value is specified in the trend, no engineering limits apply. 03 RWST LEVEL LOWERING There are no engineering limits for the trending or To verify the emergency sump level increases as the monitoring of parameters. Since no value is specified RWST level decreases. NONE in the trend, no engineering limits apply.





DATE: 04/29/93 REVISION: 03

1.A. APPROVED TABLE

AGE NO:

9 OF 10

Module #: 04

Q.A. APPROVED TABLE

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iRP	PARAMETER	STEP VALUE/ Eng. limit	BASES	USE
03	RWST LEVEL	LOWERING NONE	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To verify that RWST level is falling.
04	RWST LEVEL	> 6% LL 4.65% OF SPAN	The Eng Limit is based on having sufficient water in the RWST to provide suction to the SI and/or chg pumps. The water level at the top of the ECCS suction nozzle is 0.26% of span. The water level to the top of the CVCS suction line is 4.65% of span.	To determine when charging pump suction should be transferred to another borated water source, or to determine that they should be stopped.
04	RWST LEVEL	> 6% LL 4.65% OF SPAN 	The Eng Limit is based on having sufficient water in the RWST to provide suction to the SI and/or chg pumps. The water level at the top of the ECCS suction nozzle is 0.26% of span. The water level to the top of the CVCS suction line is 4.65% of span.	To verify RWST level is available (> 6%) as a water source for the charging pumps or ECCS pumps.
04	RWST LEVEL	> 6% LL 4.65% OF SPAN	The Eng Limit is based on having sufficient water in the RWST to provide suction to the SI and/or chg pumps. The water level at the top of the ECCS suction nozzle is 0.26% of span. The water level to the top of the CVCS suction line is 4.65% of span.	To determine the availability of alternate borated Hater sources.
05	RWST LEVEL	> 19X LL 0.26%	The lower limit is applied to ensure that adequate suction is maintained to ECCS pumps. The Engineering limit is based on the water level at the top of the ECCS suction nozzle in the RWST. This level equates to 0.26% of span.	To determine if the RWST level is adequate to supply the containment spray pumps (> 19%).

OCUMENT NO: 009-0PS92-089 AGE NO: 10 OF 10

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SONGS 2/3 ISOP II PHASE II INSTRUMENT USE AND BASES TABLE

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DATE: 04/29/93 REVISION: 03

A. APPROVED TABLE

Module #: 04

Q.A. APPROVED TABLE

RP	PARAMETER	STEP VALUE/ ENG. LIMIT	BASES	USE
05	RWST LEVEL		The lower limit is applied to ensure that adequate suction is maintained to ECCS pumps. The Engineering limit is based on the water level at the top of the ECCS suction nozzle in the RWST. This level equates to 0.26% of span.	To determine if the RWST level is adequate to supply the containment spray pumps (> 19%).
05	RWST LEVEL	> 19X LL 0.26X 	The lower limit is applied to ensure that adequate suction is maintained to ECCS pumps. The Engineering limit is based on the water level at the top of the ECCS suction nozzle in the RWST. This level equates to 0.26% of span.	To verify sufficient RWST level to start emergency boration with ECCS pumps.
)6 	RWST L eviel .	> 6% LL 0.26%	The lower limit is applied to ensure that adequate suction is maintained to ECCS pumps. The Engineering limit is based on the water level at the top of the ECCS suction nozzle in the RWST. This level equates to 0.26% of span.	To determine if it is necessary (at 6% level) to initiate makeup water to the RWST.
)7	RWST LEVEL	> 2X LL 0.26X	The lower limit is applied to ensure that adequate suction is maintained to ECCS pumps. The Engineering limit is based on the water level at the top of the ECCS suction nozzle in the RWST. This level equates to 0.26% of span.	To determine if RWST level is adequate when the ECCS pumps are alligned to take suction on the RWST.

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL OAM-101

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

009-01592-89-Re-03 Document Title/Number/Revision:

- 1. Were the inputs correctly selected and incorporated into the design?
- is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda properly identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- 7. Have the design interface requirements been satisfied?
- 8. Was an appropriate design method used?
- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required application?
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Heve adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair?
- 15. Hes adequate accessibility been provided to perform the in-service inspection expected to be required during the plant He?
- 16. Has the design properly considered radiation exposure to the public and plant personnel?

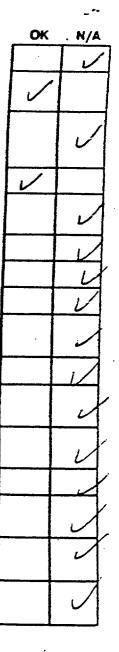


EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL

AREA BROWN BOVEN QAM-101

QAP 3.10 REVISION 1 PAGE 5 OF 5

009-0P5 92-089 Rev \$3 ÔK 17. Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished? 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified? 19. Are adequate handling, storage, cleaning and shipping requirements specified? 20. Are adequate identification requirements specified? 21. Has an appropriate the page been used? 22. Are all pages sequentially numbered and marked with a valid number? 23. Is the presentation legible and reproducible? 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change? 25. Are requirements for record preparation review, approval, retention. etc., adequately Comments/Remarks:

MARTIN GRA martin Sum 29/42

Independent Reviewer: Name/Signature/Date

EXHIBIT 3.10-1

13

File No: 009-OPS92-037 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 01 Engineering Limit and Bases **PARAMETER:** Containment Emergency Sump Level

PREPARED	BY:	L. A. Wild		
		Cognizant Engineer (Print Name)		
		L.a. Will	Date:	4/22/93
		Cognizant Engineer (Signature)		

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $N_0 \mathcal{I}$ of QAM-101.

MARTIN GRITTER

Signature

29/93

Name Independent Reviewer

APPROVED BY: ing Manager (Print Name) Cogni Engineering Manager (Signature) Cogni

File No: 009-0PS92-037 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 01

Parameter: Containment Emergency Sump Level

Step Value(s): Use(s):

> 18 ft 8 in

To determine if adequate level exists in the Containment Emergency Sump (e.g. 18 feet 8 inches) to supply the Containment Spray Pumps.

To verify proper conditions exist prior to isolating the Refueling Water Storage Tank (RWST) following a Recirculation Actuation Signal (RAS).

Engineering Limit(s):

HPSI 16.999 feet

CS 18.359 feet

Bases for Engineering Limit(s):

The engineering limits for containment sump level are based on ensuring that the level in the containment sump will provide sufficient net positive suction head (NPSH) for the Containment Spray (CS) and High Pressure Safety Injection (HPSI) Pumps after shutting the RWST isolation valves. The engineering limits are conservative in that the pump combinations assumed in Reference 5 produce flow rates and associated head losses in excess of those that should exist (Ref. 3 Design Assumptions III. A and B, page 4 of 25).

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Level Required for HPSI

The net positive suction head required $(NPSH_R)$ for the HPSI pumps is 23 feet (Reference 3, page 3 of 25). The minimum calculated net positive suction head available $(NPSH_A)$ for the HPSI pump per Ref. 3 (page 5 of 25) is 26.501 feet. Therefore there is a margin of 3.501 feet of head for the HPSI pump. Subtracting the margin from the assumed level (Reference 3, page 6 of 25) gives a minimum level to provide the NPSH_R of 16.999 feet (level assumed of 20.5 feet minus 3.501 feet margin).

File No: 009-0PS92-037 Revision: 01 Page: 3 of 3

Level Required for CS

The NPSH_R for the containment spray (CS) pumps is 24 feet (Reference 1 & 2). The minimum calculated NPSH_A for the CS pump per Reference 3 (page 5 of 25) is 26.141 feet. Therefore there is a margin of 2.141 feet of head for the CS pumps. Subtracting the margin from the assumed level (Reference 3, page 6 of 25) gives a minimum level to provide the NPSH_R of 18.359 feet (level assumed of 20.5 feet minus 2.141 feet margin).

Vortexing

Reference 4 indicates that for design basis flow rates expected after RAS (3200 gpm per sump, Ref. 4, page 9) and the expected flood level (1.47 feet above the containment floor level per Reference 5, page 5) vortexing will not occur (Ref. 4, page 5, 6 and 7).

Assumptions:

- The Bases for the Engineering Limits uses the worst case numbers from the references to calculate the required level in the sump. For the HPSI, the NPSH, from Reference 3 was used. For the CS, the NPSH, from Reference 1 & 2 was used.
- 2. In accordance with NES&L Quality Procedure SO23-XXIV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1 and 2

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References:

- 1. Updated FSAR, through revision 8, Table 6.2-29.
- 2. Updated FSAR, through revision 8, Section 6.2.1.1.2.4.
- Calculation M-12.1D, "NPSH of ESF Pumps," dated 5/23/84, SONGS File No. S023-451-A.
- 4. Nonconformance Report G-1002, Revision 0, November 29, 1989, "Containment Emergency Sump."
- 5. SONGS Calculation DC# N-0240-006 R/O, issue date November 29, 1989, "RWST Volume Tech Spec Requirement."

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	AB COMBUSTION ENCINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QUALITY ASSURANCE PROCEDURES MANUAL CHECKLIST NO. 9 CHECKLIST NO.			Are the	Are the addenda Here ap		Have the		Are the specified insterials compatible with each other and the design environmental conditions to which the material will be exposed?	Have adequate maintenance features and requirements been specified?	Are accentibility and other design provisions adequate for performance of needed maintenance and repair?	Has adequate accessibility been provided to perform the in-service impection expected to be required during the plant sile?	Hes the design property considered radiation exposure to the public and plant personnel?
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EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL

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QAP 3.10 REVISION 1 PAGE 5 OF 5

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- Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?
- 18. Have adequate pre-operational and subsequent periodic test requirements been ap-
- 19. Are adequate handling, storage, cleaning and shipping requirements specified?
- Are adequate identification requirements specified? 20.
- Has an appropriate the page been used? 21.
- Are all pages sequentially numbered and marked with a valid number? 23.
- is the presentation legible and reproducible?
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by
- 25. Are requirements for record preparation review, approval, retention, etc., adequately

Comments/Remarks:

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MARTIN GRAN Her 4/2193 Independent Reviewer: Name/Signature/Date

EXHIBIT 3.10-1

11

File No: 009-0PS92-038 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 02 Engineering Limit and Bases PARAMETER: Containment Emergency Sump Level

PREPARED BY: L. A. Wild Cognizant Engineer (Print Name) $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ Date: $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $\mathcal{M}_{\mathcal{S}}$ of QAM-101.

MARTIN GREER Name

Signature

Independent Reviewer

APPROVED BY:

Cognizant Engineering Manager (Print Name) eoqnizan ngineering Manager (Signature)

File No: 009-0PS92-038 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 02

Parameter: Containment Emergency Sump Level

Step Value(s): Use(s):

Rising To verify the emergency sump level increases as the Refueling Water Storage Tank (RWST) level decreases.

Rising To verify RWST is feeding Safety Injection, which is spilling onto the containment floor.

Rises To verify the emergency sump level increases as the RWST level decreases.

Engineering Limit(s):

None

Bases for Engineering Limit(s):

There are no associated Engineering Limits for the trending of parameters. Since no value is specified in the trend, no value will be assigned to the engineering limit. Usually when an operator is instructed to trend an indication, the indication is used in conjunction with other parameters to corroborate the condition of a safety function. An operator is not required to perform a safety related action on the trending of a single parameter by itself in the EOIs. Where the trending of a parameter is combined with specified operating limits on that parameter, the values given for the operating limit are evaluated for their engineering limits.

If the RWST level reaches the Recirculation Actuation Signal (RAS) setpoint, then the valves from the containment sump will be opened by the RAS signal. Upon confirmation that the sump level is sufficient to provide adequate suction head, the operators are directed to shut the supply from the RWST (Ref. 1). Confirmation that the Containment Sump Level is RISING or RISES as RWST level decreases ensures that the water removed from the RWST by the Safety Injection and/or Containment Spray pump(s) is being transferred to the containment sump to eventually provide the required suction head upon RAS. If the Step Value is not

File No: 009-OPS92-038 Revision: 01 Page: 3 of 3

| rev. 01

observed, then the operators are directed to ensure that adequate level is maintained in the RWST to provide suction to the running pumps.

Assumptions:

1. In accordance with NES&L Quality Procedure S023-XXIV-7-15, the reference noted below is considered to be Secondary Design documents. Its use as a reference document for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license. | rev. 01

Ref: 1

References:

1. Updated FSAR, through revision 8, Section 6.2.2.1.2.3.B. | rev. 01



QAP 3.10 **REVISION 1** PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checidist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checidist is used, and if applicable, the Independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: _ 009-01592-038 Re-ØI

- Were the inputs correctly selected and incorporated into the design? 1.
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions,
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
- Are the appropriate quality and quality assurance requirements specified? 4
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda property identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- 7. Have the design interface requirements been satisfied?
- Was an appropriate design method used? 8
- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly
- 10. Is the output (results and conclusions) reasonable compared to inputs,
- Are the specified parts, equipment, and processes suitable for the required ap-11.
- Are the specified materials compatible with each other and the design environmental 12 conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?
- 16. Has the design properly considered radiation exposure to the public and plant

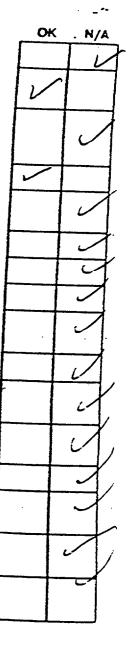


EXHIBIT 3.10-1

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QAP 3.10 REVISION 1 PAGE 5 OF 5

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marter Sur ARTIN GREAR 4/29/93

Independent Reviewer: Name/Signature/Date

EXHIBIT 3.10-1

File No: 009-OPS92-039 Revision: 01 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 03 Engineering Limit and Bases **PARAMETER:** Containment Emergency Sump Level

PREPARED BY: <u>L. A. Wild</u> Cognizant Engineer (Print Name) <u>A</u> A W Date: $\frac{4/2^2/93}{100}$ Cognizant Engineer (Signature)

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $N_O \hat{I}$ of QAM-101.

FER. Name

Signature

Independent Reviewer

APPROVED BY:

Cognizant Engineering Manager (Print Name) Cognizant Engineering Manager (Signature)

File No: 009-OPS92-039 Revision: 01 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 03

Parameter: Containment Emergency Sump Level

Step Value(s): Use(s):

NORMAL

To determine if containment conditions indicate an event other than Steam Generator Tube Rupture (SGTR) is in progress.

Engineering Limit(s):

None

Bases for Engineering Limit(s):

There are no associated Engineering Limits for the trending of parameters. Since no value is specified in the trend, no value will be assigned to the engineering limit. Usually when an operator is instructed to trend an indication, the indication is used in conjunction with other parameters to corroborate the condition of a safety function. An operator is not required to perform a safety related action on the trending of a single for parameter by itself in the EOIs. Where the trending of a parameter is combined with specified operating limits on that parameter, the values given for the operating limit are evaluated for their engineering limits.

If only a SGTR has occurred, there should be no increase in the Containment Emergency Sump Level. An increase in the sump level would indicate that an event other than or in addition to a SGTR was in progress. Verification that the sump level is NORMAL, in concert with other parameters verified in the procedure, provides assurance that the diagnosis of a SGTR is correct.

Assumptions:

None

References:

None

ASEA BROWN BOVEN QAM-101

QAP 3.10 **REVISION 1** PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include k in the reviewer's statement.

Document Title/Number/Revision:

1. Were the inputs correctly selected and incorporated into the design?

- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions,
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda properly identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- 7. Have the design interface requirements been satisfied?
- Was an appropriate design method used? 8
- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required ap-
- Are the specified materials compatible with each other and the design environmental 12 conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair?
- Has adequate accessibility been provided to perform the in-service inspection 15. expected to be required during the plant life?
- 16. Has the design properly considered radiation exposure to the public and plant

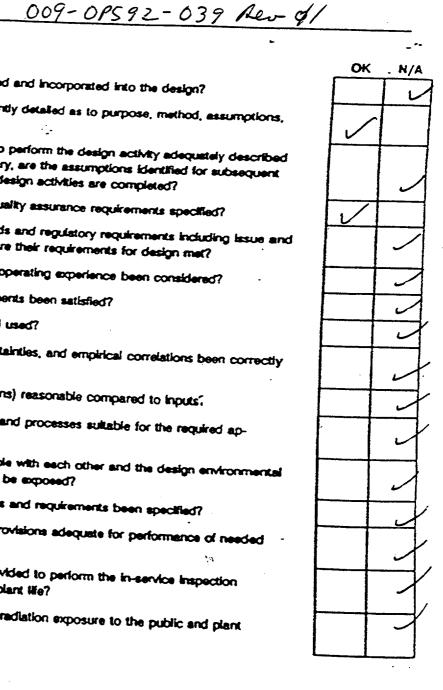


EXHIBIT 3.10-1

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ABEA BROWN BOVEN QAM-101

QAP 3.10 REVISION 1 PAGE 5 OF 5

009-0PS 92-039 Rer 61

- Are the acceptance criteria incorporated in the design documents sufficient to allow 17. verification that design requirements have been satisfactorily accomplished?
- 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified?
- Are adequate handling, storage, cleaning and shipping requirements specified? 19.
- Are adequate identification requirements specified? 20.
- 21. Has an appropriate the page been used?
- Are all pages sequentially numbered and marked with a valid number? 22,
- is the presentation legible and reproducible? 21
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
- 25. Are requirements for record preparation review, approval, retention. etc., adequately

Comments/Remarks:

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Independent Reviewer: Name/Signature/Date

EXHIBIT 3.10-1

File No: 009-OPS92-040 Revision: 01 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 04 Engineering Limit and Bases PARAMETER: Containment Emergency Sump Level

PREPARED	BY:	L. A. Wild		
		Cognizant Engineer (Print Name)		
			Date:	<u> 1/28/93</u>
		Cognizant Engineer (Signature)		

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $No \ \varphi$ of QAM-101.

Name

Signature

Independent Reviewer

APPROVED BY:

Cognizant Engineering Manager (Print Name) Cognizant /Engineering Manager (Signature)

File No: 009-OPS92-040 Revision: 01 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 04

Parameter: Containment Emergency Sump Level

Step Value(s): Use(s):

NOT RISING To verify Containment Emergency Sump not rising and re-diagnose the event if it is.

NOT RISING To determine that Containment Emergency Sump Level is not rising as RWST level decreases and evaluate methods to maintain RWST level >19%.

Engineering Limit(s):

None

Bases for Engineering Limit(s):

There are no associated Engineering Limits for the trending of parameters. Since no value is specified in the trend, no value will be assigned to the engineering limit. Usually when an operator is instructed to trend an indication, the indication is used in conjunction with other parameters to corroborate the condition of a safety function. An operator is not required to perform a safety related action based on the trending of a single parameter by itself in the EOIs. Where the trending of a parameter is combined with specified operating limits on that parameter, the values given for the operating limit are evaluated for their engineering limits.

Verification that the Containment Emergency Sump Level is NOT RISING provides assurance that only a SGTR is in progress. This parameter is used in concert with monitoring of RWST level to determine that only a SGTR event is occurring.

Assumptions:

None

References:

None

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QAP 3.10 **REVISION 1** PAGE 4 OF 5

OK

N/A

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Flevision: 009-0P592-040 Rev

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- tly selected and incorporated into the design? 2. Is the material presented sufficiently detailed as to purpose, method, assumptions,
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
- 4. Are the appropriate qualky and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda properly identified, and are their requirements for design met?
- Have applicable construction and operating experience been considered? 6
- 7. Have the design interface requirements been satisfied?
- 8
- Was an appropriate design method used?
- 2. Have the adjustment factors, uncertainties, and empirical correlations been correctly
- is the output (results and conclusions) reasonable compared to inputs? 10
- Are the specified parts, equipment, and processes suitable for the required ap-11.
- Are the specified materials compatible with each other and the design environmental 12 conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant He?
- 16. Has the design properly considered radiation exposure to the public and plant

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EXHIBIT 3.10-1

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File No: 009-OPS92-041 Revision: 01 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 05 Engineering Limit and Bases **PARAMETER:** Containment Emergency Sump Level

PREPARED BY:	L. A. Wild		
	Cognizant Engineer (Print Name)		
	L. J. Will	Date:	4/28/93
	Cognizant Engineer (Signature)	•	

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $\frac{N_o}{2}$ of QAM-101.

F F N

Signature

Independent Reviewer

APPROVED BY:

Cognizant Engineering Manager (Print Name) Cognizant Engineering Manager (Signature)

File No: 009-OPS92-041 Revision: 01 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 05

Parameter: Containment Emergency Sump Level

Step Value(s): Use(s):

NOT RISING To verify conditions inside containment to be normal.

Engineering Limit(s):

None

Bases for Engineering Limit(s):

There are no associated Engineering Limits for the trending of parameters. Since no value is specified in the trend, no value will be assigned to the engineering limit. Usually when an operator is instructed to trend an indication, the indication is used in conjunction with other parameters to corroborate the condition of a safety function. An operator is not required to perform a safety related action based on the trending of a single parameter by itself in the EOIs. Where the trending of a parameter is combined with specified operating limits on that parameter, the values given for the operating limit are evaluated for their engineering limits.

This step value noted is used to determine whether a Loss of Feedwater as a result of a feedline break is occurring inside the containment. The verification that the Containment Emergency Sump Level is NOT RISING in addition to verification that other containment environment parameters (i.e., temperature, pressure and humidity) have not been affected will indicate that any feedline break which may exist is outside of the containment.

Assumptions:

None

References:

None

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	•	CHECKLIST NO. 9		
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EXHIBIT 3.10-1

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Comments/Remarks: _

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Independent Reviewer. Name/Signature/Date

EXHIBIT 3.10-1

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File No: 009-OPS92-042 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 06 Engineering Limit and Bases **PARAMETER:** Containment Emergency Sump Level

PRÉPARED BY:

L. A. Wild Cognizant Engineer (Print Name) Date: 4/27/93 Cognizant Engineer (Signature)

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists N_2 9 of QAM-101.

ANTIN GREAR Name Signature Date Independent Reviewer

APPROVED BY:

Cognizant Engineering Manager (Print Name) Cognizant /Engineering Manager (Signature)

File No: 009-OPS92-042 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 06

Parameter: Containment Emergency Sump Level

Step Value(s): Use(s):

rev. 01

> 17 FT To ensure adequate ECCS inventory in containment sump if RWST level is below the RAS setpoint.

Engineering Limit(s):

HPSI 16.999 feet

CS 18.359 feet

Bases for Engineering Limit(s):

The engineering limits for containment sump level are based on ensuring that the level in the containment sump will provide sufficient net positive suction head (NPSH) for the Containment Spray (CS) and High Pressure Safety Injection (HPSI) Pumps after shutting the RWST isolation valves. The engineering limits are conservative in that the pump combinations assumed in Reference 5 produce flow rates and associated head losses in excess of those that should exist (Ref. 3 Design Assumptions III. A and B, page 4 of 25).

Level Required for HPSI

The net positive suction head required $(NPSH_R)$ for the HPSI pumps is 23 feet (Reference 3, page 3 of 25). The minimum calculated net positive suction head available $(NPSH_A)$ for the HPSI pump per Ref. 3 (page 5 of 25) is 26.501 feet. Therefore there is a margin of 3.501 feet of head for the HPSI pump. Subtracting the margin from the assumed level (Reference 3, page 6 of 25) gives a minimum level to provide the NPSH_R of 16.999 feet (level assumed of 20.5 feet minus 3.501 feet margin).

File No: 009-OPS92-042 Revision: 01 Page: 3 of 3

Level Required for CS

The NPSH_R for the containment spray (CS) pumps is 24 feet (Reference 1 & 2). The minimum calculated NPSH_A for the CS pump per Reference 3 (page 5 of 25) is 26.141 feet. Therefore there is a margin of 2.141 feet of head for the CS pumps. Subtracting the margin from the assumed level (Reference 3, page 6 of 25) gives a minimum level to provide the NPSH_R of 18.359 feet (level assumed of 20.5 feet minus 2.141 feet margin).

Vortexing

Reference 4 indicates that for design basis flow rates expected after RAS (3200 gpm per sump, Ref. 4, page 9) and the expected flood level (1.47 feet above the containment floor level per Reference 5, page 5) vortexing will not occur (Ref. 4, page 5, 6 and 7).

Assumptions:

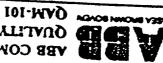
- The Bases for the Engineering Limits uses the worst case numbers from the references to calculate the required level in the sump. For the HPSI, the NPSH_R from Reference 3 was used. For the CS, the NPSH_R from Reference 1 & 2 was used.
- 2. In accordance with NES&L Quality Procedure S023-XXIV-7-15, the reference noted below is considered to be Secondary Design documents. Its use as a reference document for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1 and 2

rev. 01

References:

- 1. Updated FSAR, through revision 8, Table 6.2-29.
- 2. Updated FSAR, through revision 8, Section 6.2.1.1.2.4.
- 3. Calculation M12.1D, "NPSH of ESF Pumps," dated 5/23/84, SONGS File No. S023-451-A.
- Nonconformance Report G-1002, Revision 0, November 29, 1989,
 "Containment Emergency Sump."
- 5. SONGS Calculation DC# N-0240-006 R/O, issue date November 29, 1989, "RWST Volume Tech Spec Requirement."



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REVIEW OF OTHER DESIGN DOCUMENTS

Checkdist 1 (Exhibit 3.3-1 of OAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

009-0829-092 100 Document The/Number/Revision:

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- Is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?
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- 4. Are the appropriate quality and quality assurance requirements specified?
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- 7. Have the design interface requirements been satisfied?
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- Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?
- 10. Is the output (results and condusions) reasonable compared to inputs.
- 11. Are the specified parts, equipment, and processes suitable for the required application?
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenence features and requirements been specified?
- 14. Are accessiblely and other design provisions adequate for performance of needed maintenance and repair?
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant IIIe?
- Hea the design properly considered radiation exposure to the public and plant personnel?

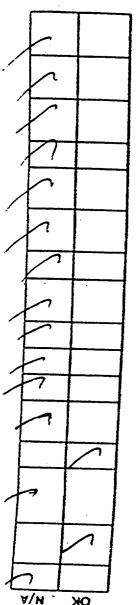


EXHIBIT 3.10-1

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MARTIN GREER/ Martin, 4/29/93 True Independent Reviewer: Name/Signature/Date

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File No: 009-OPS92-081 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 01 Engineering Limit and Bases **PARAMETER:** Containment H/R Monitors

PREPARED BY: <u>L. A. Wild</u> Cognizant Engineer (Print Name) <u>Cognizant Engineer (Signature)</u> Date: $\frac{1/22/93}{1/22/93}$

<u>VERIFICATION STATUS: COMPLETE</u> The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists <u>No 1</u> of QAM-101.

MARTIN GREER

Name Independent Reviewer

Signature

Date

APPROVED BY:

Cognizant Engineering Manager (Print Name)

Cognizant Engineering Manager (Signature)

File No: 009-OPS92-081 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 01

Parameter: Containment High Radiation Monitors

Step Value(s): Use(s):

< 40 R/HR

To evaluate initiating CSAS for iodine removal if containment radiation monitor is <u>NOT</u> reading < 40 R/HR.

Engineering Limit(s):

Upper Limit 20 R/hr

Bases for Engineering Limit(s):

The limit is based on engineering judgement. One function of the Iodine Removal System (IRS) is to remove radioactive iodine from the containment atmosphere following a design basis loss-ofcoolant accident (LOCA) (Ref. 1). The high range containment radiation detectors have a high-high alarm of 20 R/hr (Ref. 2). Figures 12.3-68 and 12.3-69 (Ref. 3) indicate that a dose rate of 20 R/hr is above the expected radiation level in the containment for the "RCS Maximum". Reference 4 indicates that the "RCS Maximum" curve is the expected radiation level which would exist if 100% of the maximum concentration of reactor coolant isotopes were released to the containment (Ref. 4 pages 6 and 47). In the event of a LOCA, the containment radiation level is used to determine whether the IRS should be placed in service. Considering the references above, a level \geq 20 R/hr is higher than the expected dose rate that would exist and is an indication that some fuel failure has occurred. Initiation or continued use of the Containment Spray system for iodine removal would be considered prudent for such cases.

Note, the RCS maximum as specified in Reference 3 and 4 should not be confused with the 1% failed fuel condition in the same references. As indicated in Reference 4, the RCS maximum assumes the concentrations specified in FSAR Table 11.1-2 (Reference 5) are released while the 1% failed fuel assumes the release of concentrations per Regulatory Guide 1.4 (See Reference 4, pages 6, 47, and 48).

File No: 009-OPS92-081 Revision: 01 Page: 3 of 3

Assumptions:

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1. In accordance with NES&L Quality Procedure S023-XXIV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license. | rev. 01

Ref: 1, 2, 3 and 5

rev. 01

References:

- 1. Updated FSAR, through revision 8, Section 6.5.2.
- 2. Updated FSAR, through revision 8, Section 12.3.4.3.2.
- 3. Updated FSAR, through revision 8, Figures 12.3-68 and 69.
- 4. Calculation N-4098-3, "Post Accident Radiation."
- 5. Updated FSAR, through revision 8, Table 11.1-2, "Maximum Reactor Coolant Radioisotope Concentration One Percent Failed Fuel, No Gas Stripping."

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

QAP 3.10 REVISION 1 PAGE 4 OF 5

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EXHIBIT 3.10-1

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File No: 009-0PS92-055 **Revision:** 01 1 of 3 Page:

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT: Southern California Edison PLANT: San Onofre 2&3 **PROJECT:** ISOPS II Support C-E JOB NUMBER: 2001216

DOCUMENT: Module 04 Group 01 Engineering Limit and Bases Containment Hydrogen Concentration **PARAMETER:**

PREPARED BY:	L. A. Wild		
	Cognizant Engineer (Print Name)		
	L. a. wild	Date:	4/22/83
	Cognizant Engineer (Signature)		······
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VERIFICATION STATUS: COMPLETE

Cognitant

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists <u>No 9</u> of QAM-101.

ANTIN GREER

Signature

Name Independent Reviewer

APPROVED BY:

madan Cognizant Engineering Manager (Print Name)

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Engineering Manager (Signature) Date

File No: 009-OPS92-055 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 01

Parameter: Containment Hydrogen Concentration

Step Value(s): Use(s):

< 0.5%

To determine if the hydrogen recombiners need to be operating (H_2 concentration ≥ 0.5 %).

Engineering Limit(s):

Lower Limit 0 %

Upper Limit 4 %

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Bases for Engineering Limit(s):

The accuracy of the hydrogen monitoring subsystem is \pm 5% of the full scale reading of 10% (Ref 1). Therefore if there is any indication of hydrogen concentration the actual reading could be 0.5% higher (e.g., a reading of 0.1% could be an indication of up to 0.6% actual concentration; an actual concentration of 4% could read as low as 3.5%).

The lower limit is based on maintaining the hydrogen concentration as low as possible. As noted in the EPG Bases (Ref. 2), although hydrogen is not flammable until it achieves a concentration of at least 4% in air, it is prudent to reduce hydrogen to as low a concentration as possible (i.e., less than the minimum detectable concentration). Therefore the hydrogen recombiners are placed in service at any concentration greater than 0% to ensure that a further buildup of hydrogen does not occur.

The upper limit is based on ensuring that a hydrogen burn or explosion does not take place when the recombiner is placed in service. The recombination process occurs as a result of heating the process gases to an elevated temperature (Ref. 3). As this is not a catalytic process but a burn process, the elevated temperature could cause a hydrogen burn or an explosion if a recombiner was energized with a high hydrogen concentration in the containment. Reference 4 specifies that the hydrogen recombiner should not be energized with a hydrogen level at or above 3.5% as verified by chemical analysis. This reference also

 File No:
 009-0PS92-055

 Revision:
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 Page:
 3 of 3

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reaches 3.5%. The use of 3.5% in the reference is apparently based on the given accuracy of the hydrogen analyzer (5 % of Full Scale 1 - 10 %, i.e., 0.5% Therefore a level of 3.5% by hydrogen analyzer reading could actually be as high as 4%.) (Ref. 1) and/or a margin to the burnable level of 4%. A level 4% H₂ is generally accepted to be the level at which hydrogen becomes burnable in dry air and is the actual engineering limit as specified above.

Assumptions:

1. In accordance with NES&L Quality Procedure S023-XXIV-7-15, the reference noted below is considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license. | rev. 01

Ref: 1 and 3

2. The reference noted below is assumed to be Secondary Design documents. This assumption is justified based on the fact that they describe strategies which have been reviewed and commented on by the NRC.

Ref: 2

3. In accordance with NES&L Quality Procedure SO23-XXIV-7-15, documents that are not Primary or Secondary Design documents may be used as reference documents if justification is provided. The reference noted below is formal engineering correspondence between the design principals (e.g., NSSS vendor architect, etc.) and SCE. Its use as reference material is justified when the basis for the engineering limit is "operational experience" or "engineering judgement", and no Primary or Secondary Design Document exists.

Ref: 4

References:

- 1. Updated FSAR, through Revision 8, Table 6.2-36. | rev. 01
- Emergency Procedure Guidelines, CEN-152, Revision 3, Bases page 5-95.
- 3. Updated FSAR, through revision 8, Section 6.2.5.3.A. | rev. 01
- 4. Operating Instruction S023-3-2.28, Revision 6, dated April 5, 1985.

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QAP 3.10 **REVISION 1** PAGE 4 OF 5

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CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision:_

009-0P592-055

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. is the material presented sufficiently detailed as to purpose, method, assumptions,
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda property identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- 7. Have the design interface requirements been satisfied?
- Was an appropriate design method used? 8.
- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required ap-
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?
- Has the design properly considered radiation exposure to the public and plant 16.

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EXHIBIT 3.10-1

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QAP 3.10 REVISION 1 PAGE 5 OF 5

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009-0PS 92-055 Rod/ ÔK Are the acceptance criteria incorporated in the design documents sufficient to allow 17. verification that design requirements have been satisfactorily accomplished? 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified? 19. Are adequate handling, storage, cleaning and shipping requirements specified? Are adequate identification requirements specified? 20. 21. Has an appropriate the page been used? 22. Are all pages sequentially numbered and marked with a valid number? is the presentation legible and reproducible? 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change? 25. Are requirements for record preparation review, approval, retention, etc., adequately Comments/Remarks:

4/29/93

Independent Reviewer. Name/Signature/Date

EXHIBIT 3.10-1

File No: 009-OPS92-062 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 02 Engineering Limit and Bases **PARAMETER:** Containment Hydrogen Concentration

PREPARED BY:	L. A. Wild		
	Cognizant Engineer (Egint Name)		
	- Dilill	Date:	4/23/43
	Cognizant Engineer (Signature)	•	

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists N_{\circ} of QAM-101.

Name

Signature

Date

Independent Reviewer

APPROVED BY:

Cognizant Engineering Manager (Print Name) Cognizant Engineering Manager (Signature)

File No: 009-OPS92-042 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 06

Parameter: Containment Emergency Sump Level

Step Value(s): Use(s):

> 17 FT

| rev. 01

To ensure adequate ECCS inventory in containment sump if RWST level is below the RAS setpoint.

Engineering Limit(s):

HPSI 16.999 feet

CS 18.359 feet

Bases for Engineering Limit(s):

The engineering limits for containment sump level are based on ensuring that the level in the containment sump will provide sufficient net positive suction head (NPSH) for the Containment Spray (CS) and High Pressure Safety Injection (HPSI) Pumps after shutting the RWST isolation valves. The engineering limits are conservative in that the pump combinations assumed in Reference 5 produce flow rates and associated head losses in excess of those that should exist (Ref. 3 Design Assumptions III. A and B, page 4 of 25).

Level Required for HPSI

The net positive suction head required $(NPSH_R)$ for the HPSI pumps is 23 feet (Reference 3, page 3 of 25). The minimum calculated net positive suction head available $(NPSH_A)$ for the HPSI pump per Ref. 3 (page 5 of 25) is 26.501 feet. Therefore there is a margin of 3.501 feet of head for the HPSI pump. Subtracting the margin from the assumed level (Reference 3, page 6 of 25) gives a minimum level to provide the NPSH_R of 16.999 feet (level assumed of 20.5 feet minus 3.501 feet margin).

File No: 009-OPS92-042 Revision: 01 Page: 3 of 3

Level Required for CS

The NPSH_R for the containment spray (CS) pumps is 24 feet (Reference 1 & 2). The minimum calculated NPSH_A for the CS pump per Reference 3 (page 5 of 25) is 26.141 feet. Therefore there is a margin of 2.141 feet of head for the CS pumps. Subtracting the margin from the assumed level (Reference 3, page 6 of 25) gives a minimum level to provide the NPSH_R of 18.359 feet (level assumed of 20.5 feet minus 2.141 feet margin).

Vortexing

Reference 4 indicates that for design basis flow rates expected after RAS (3200 gpm per sump, Ref. 4, page 9) and the expected flood level (1.47 feet above the containment floor level per Reference 5, page 5) vortexing will not occur (Ref. 4, page 5, 6 and 7).

Assumptions:

- The Bases for the Engineering Limits uses the worst case numbers from the references to calculate the required level in the sump. For the HPSI, the NPSH_R from Reference 3 was used. For the CS, the NPSH_R from Reference 1 & 2 was used.
- 2. In accordance with NES&L Quality Procedure S023-XXIV-7-15, the reference noted below is considered to be Secondary Design documents. Its use as a reference document for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1 and 2

rev. 01

References:

- 1. Updated FSAR, through revision 8, Table 6.2-29.
- 2. Updated FSAR, through revision 8, Section 6.2.1.1.2.4.
- Calculation M12.1D, "NPSH of ESF Pumps," dated 5/23/84, SONGS File No. S023-451-A.
- 4. Nonconformance Report G-1002, Revision 0, November 29, 1989, "Containment Emergency Sump."
- 5. SONGS Calculation DC# N-0240-006 R/O, issue date November 29, 1989, "RWST Volume Tech Spec Requirement."

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL BEA BROWN BONON QAM-101

QAP 3.10 **REVISION 1** PAGE 4 OF 5

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CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: ____ 009-0P592-042 Rev- &1

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions,
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda property identified, and are their requirements for design met?
- Have applicable construction and operating experience been considered? 6
- Have the design interface requirements been satisfied? 7.
- Was an appropriate design method used? 8
- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required ap-
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed
- Has adequate accessibility been provided to perform the in-service inspection 15. expected to be required during the plant life?
- 16. Has the design properly considered radiation exposure to the public and plant



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QAP 3.10 **REVISION 1** PAGE 5 OF 5

 O 0 9-0P5 92- 17. Are the acceptance criteria incorporated in the design documents sufficient to all verification that design requirements have been been provided. 	OK A
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to the presentation legible and reproducible?	
24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?	
25. Are requirements for record preparation review, approval, retention. etc., adequately specified?	
Comments/Remarks:	······································

MARTIN GREER marter You 4/29/93 Independent Reviewer: Name/Signature/Date

EXHIBIT 3.10-1

File No: 009-OPS92-081 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER: 2001216

DOCUMENT: Module 04 Group 01 Engineering Limit and Bases **PARAMETER:** Containment H/R Monitors

PREPARED BY: <u>L. A. Wild</u> Cognizant Engineer (Print Name) <u>L. A. Wild</u> Cognizant Engineer (Signature) Date: $\frac{1/22/93}{22/93}$

<u>VERIFICATION STATUS: COMPLETE</u> The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists No 9 of QAM-101.

MARTIN GREER Name

Independent Reviewer

Marti Signature

Date

APPROVED BY:

Cognizant Engineering Magager (Print Name) Cognizant Engineering Manager (Signature)

File No: 009-0PS92-081 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 01

Parameter: Containment High Radiation Monitors

Step Value(s): Use(s):

< 40 R/HR

To evaluate initiating CSAS for iodine removal if containment radiation monitor is <u>NOT</u> reading < 40 R/HR.

Engineering Limit(s):

Upper Limit 20 R/hr

Bases for Engineering Limit(s):

The limit is based on engineering judgement. One function of the Iodine Removal System (IRS) is to remove radioactive iodine from the containment atmosphere following a design basis loss-ofcoolant accident (LOCA) (Ref. 1). The high range containment radiation detectors have a high-high alarm of 20 R/hr (Ref. 2). Figures 12.3-68 and 12.3-69 (Ref. 3) indicate that a dose rate of 20 R/hr is above the expected radiation level in the containment for the "RCS Maximum". Reference 4 indicates that the "RCS Maximum" curve is the expected radiation level which would exist if 100% of the maximum concentration of reactor coolant isotopes were released to the containment (Ref. 4 pages 6 and 47). event of a LOCA, the containment radiation level is used to In the determine whether the IRS should be placed in service. Considering the references above, a level \geq 20 R/hr is higher than the expected dose rate that would exist and is an indication that some fuel failure has occurred. Initiation or continued use of the Containment Spray system for iodine removal would be considered prudent for such cases.

Note, the RCS maximum as specified in Reference 3 and 4 should not be confused with the 1% failed fuel condition in the same references. As indicated in Reference 4, the RCS maximum assumes the concentrations specified in FSAR Table 11.1-2 (Reference 5) are released while the 1% failed fuel assumes the release of concentrations per Regulatory Guide 1.4 (See Reference 4, pages 6, 47, and 48).

File No: 009-0PS92-081 Revision: 01 Page: 3 of 3

Assumptions:

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In accordance with NES&L Quality Procedure SO23-XXIV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1, 2, 3 and 5

rev. 01

References:

- 1. Updated FSAR, through revision 8, Section 6.5.2.
- 2. Updated FSAR, through revision 8, Section 12.3.4.3.2.
- 3. Updated FSAR, through revision 8, Figures 12.3-68 and 69.
- 4. Calculation N-4098-3, "Post Accident Radiation."
- 5. Updated FSAR, through revision 8, Table 11.1-2, "Maximum Reactor Coolant Radioisotope Concentration One Percent Failed Fuel, No Gas Stripping."

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: 009-0P592-081 OK N/A 1. Were the inputs correctly selected and incorporated into the design? 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed? 4. Are the appropriate quality and quality assurance requirements specified? L 5. Are the applicable codes, standards and regulatory requirements including issue and addends properly identified, and are their requirements for design met? Have applicable construction and operating experience been considered? 6 Have the design interface requirements been satisfied? 7. Was an appropriate design method used? 8 Have the adjustment factors, uncertainties, and empirical correlations been correctly 2 Is the output (results and conclusions) reasonable compared to inputs? 10. 11. Are the specified parts, equipment, and processes suitable for the required ap-12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed? 13. Have adequate maintenance features and requirements been specified? 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair? 14 Has adequate accessibility been provided to perform the in-service inspection 15. expected to be required during the plant He? 16

16. Has the design properly considered radiation exposure to the public and plant personnel?

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QAP 3.10 REVISION 1 PAGE 5 OF 5

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009-0P5 92-081 Ring/ Are the acceptance criteria incorporated in the design documents sufficient to allow 17. verification that design requirements have been satisfactorily accomplished? 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified? 19. Are adequate handling, storage, cleaning and shipping requirements specified? Are adequate identification requirements specified? 20. Has an appropriate the page been used? 21. Are all pages sequentially numbered and marked with a valid number? 22 is the presentation legible and reproducible? 23. Have all cross-outs or overstrikes in the documentation been initialed and dated by 24. the author of the change? 25. Are requirements for record preparation review, approval, retention, etc., adequately Comments/Remarks:

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Independent Reviewer. Name/Signature/Date

EXHIBIT 3.10-1

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File No: 009-0PS92-055 **Revision:** 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

Southern California Edison CLIENT: PLANT: San Onofre 2&3 PROJECT: ISOPS II Support C-E JOB NUMBER: 2001216

DOCUMENT: Module 04 Group 01 Engineering Limit and Bases PARAMETER: Containment Hydrogen Concentration

PREPARED BY:

L. A. Wild Cognizant Engineer (Print Name) Cognizant Engineer (Signature)

_ Date: <u>4/22/93</u>

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists 10 / of QAM-101.

Name

MARTIN GREER Marty Green 4/29/93 Jame Signature Date

Independent Reviewer

APPROVED BY:

Cognizant Engineering Manager (Print Name)

Cognizant Engineering Manager (Signature) Date

File No: 009-OPS92-055 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 01

Parameter: Containment Hydrogen Concentration

Step Value(s): Use(s):

< 0.5%

To determine if the hydrogen recombiners need to be operating $(H_2 \text{ concentration } \ge 0.5\%)$.

Engineering Limit(s):

Lower Limit 0 %

Upper Limit 4 %

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Bases for Engineering Limit(s):

The accuracy of the hydrogen monitoring subsystem is \pm 5% of the full scale reading of 10% (Ref 1). Therefore if there is any indication of hydrogen concentration the actual reading could be 0.5% higher (e.g., a reading of 0.1% could be an indication of up to 0.6% actual concentration; an actual concentration of 4% could read as low as 3.5%).

The lower limit is based on maintaining the hydrogen concentration as low as possible. As noted in the EPG Bases (Ref. 2), although hydrogen is not flammable until it achieves a concentration of at least 4% in air, it is prudent to reduce hydrogen to as low a concentration as possible (i.e., less than the minimum detectable concentration). Therefore the hydrogen recombiners are placed in service at any concentration greater than 0% to ensure that a further buildup of hydrogen does not occur.

The upper limit is based on ensuring that a hydrogen burn or explosion does not take place when the recombiner is placed in service. The recombination process occurs as a result of heating the process gases to an elevated temperature (Ref. 3). As this is not a catalytic process but a burn process, the elevated temperature could cause a hydrogen burn or an explosion if a recombiner was energized with a high hydrogen concentration in the containment. Reference 4 specifies that the hydrogen recombiner should not be energized with a hydrogen level at or above 3.5% as verified by chemical analysis. This reference also

File No: 009-OPS92-055 Revision: 01 Page: 3 of 3

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| rev. 01

reaches 3.5%. The use of 3.5% in the reference is apparently based on the given accuracy of the hydrogen analyzer (5 % of Full Scale 1 - 10 %, i.e., 0.5% Therefore a level of 3.5% by hydrogen analyzer reading could actually be as high as 4%.) (Ref. 1) and/or a margin to the burnable level of 4%. A level 4% H₂ is generally accepted to be the level at which hydrogen becomes burnable in dry air and is the actual engineering limit as specified above.

Assumptions:

 In accordance with NES&L Quality Procedure S023-XXIV-7-15, the reference noted below is considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1 and 3

2. The reference noted below is assumed to be Secondary Design documents. This assumption is justified based on the fact that they describe strategies which have been reviewed and commented on by the NRC.

Ref: 2

3. In accordance with NES&L Quality Procedure SO23-XXIV-7-15, documents that are not Primary or Secondary Design documents may be used as reference documents if justification is provided. The reference noted below is formal engineering correspondence between the design principals (e.g., NSSS vendor architect, etc.) and SCE. Its use as reference material is justified when the basis for the engineering limit is "operational experience" or "engineering judgement", and no Primary or Secondary Design Document exists.

Ref: 4

References:

- 1. Updated FSAR, through Revision 8, Table 6.2-36.
- 2. Emergency Procedure Guidelines, CEN-152, Revision 3, Bases page 5-95.
- 3. Updated FSAR, through revision 8, Section 6.2.5.3.A. | rev. 01
- 4. Operating Instruction SO23-3-2.28, Revision 6, dated April 5, 1985.

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QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

DOCUMENT THE AL

curnent The/Number/Revision: _	009-0P592-055 Rev 1

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions,
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda property identified, and are their requirements for design mat?
- 6. Have applicable construction and operating experience been considered?
- 7. Have the design interface requirements been satisfied?
- 8. Was an appropriate design method used?
- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required ap-
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair?
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?
- 16. Has the design property considered radiation exposure to the public and plant

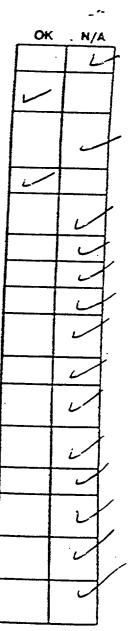
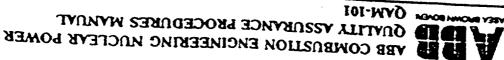


EXHIBIT 3.10-1



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verification that design requirements have been satisfactorily accomplished? Are the acceptance criteria incorporated in the design documents sufficient to allow 71

- te. Heve adequate pre-operational and subsequent periodic test requirements been ap-
- 19. Are adequate handling, storage, cleaning and shipping requirements specified?
- 20. Are adequate identification requirements specified?
- 21. Has an appropriate the page been used?
- 23. Is the presentation legible and reproducible?
- 24. Here all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
- specified? 25. Are requirements for record preparation review, approval, retention, etc., adequately

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EXHIBIT 3.10-1

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File No: 009-0PS92-062 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 02 Engineering Limit and Bases **PARAMETER:** Containment Hydrogen Concentration

PREPARED BY:	L. A. Wild	
	Cognizant Engineer (Baint Name)	-
	- Ditill	Date: 4/23/43
	Cognizant Engineer (Signature)	
		•
VEDTETON		
	<u>ION STATUS: COMPLETE</u> -y-Related design information conta	since in this
document	has been verified to be correct	by means of
Design Re	view using Checklists N_{\circ} 9 of Q	AM-101.

Name

<u>Micestu / fu</u> Signature

Date

Independent Reviewer

APPROVED BY:

Cognizant Engineering Manager (Print Name) Cognizant Engineering Manager (Signature)

File No: 009-0PS92-062 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 02

Parameter: Containment Hydrogen Concentration

Step Value(s): Use(s):

< 4%

To determine if containment hydrogen concentration is low enough to permit energization of the hydrogen recombiners (< 4%).

Engineering Limit(s): < 4%

Bases for Engineering Limit(s):

The recombination process occurs as a result of heating the process gases to an elevated temperature (Ref. 1). As this is not a catalytic process but a burn process, the elevated temperature could cause a hydrogen burn or an explosion if a recombiner was energized with a high hydrogen concentration in the containment.

Reference 3 specifies that the hydrogen recombiner should not be energized with a hydrogen level at or above 3.5% as verified by chemical analysis. This procedure also specifies that the recombiners must be secured if concentration reaches 3.5%. selection of 3.5% is apparently based on the given accuracy of The the hydrogen analyzer (5 % of Full Scale 1 - 10 %, i.e., 0.5% Therefore a level of 3.5% by hydrogen analyzer reading could actually be as high as 4%.) (Ref. 2) and/or the 3.5% provides a margin to the burnable level of 4%. In addition, it is noted that there is a warmup time associated with the hydrfen recombiner during which the hydrogen level can be expected to increase. The 3.5% procedural limit of Reference 3 may have also been set to take this into account in providing a margin for buildup while the recombiner comes on the line.

A level 4% H_2 is generally accepted to be the level at which hydrogen becomes burnable in dry air and therefore this value has been specified as the engineering limit.

File No: 009-OPS92-062 Revision: 01 Page: 3 of 3

Assumptions:

 In accordance with NES&L Quality Procedure S023-XXIV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1 and 2

rev. 01

References:

- 1. Updated FSAR, through revision 8, Section 6.2.5.3.A.
- 2. Updated FSAR, through revision 8, Table 6.2-36.
- Operating Instruction S023-3-2.28, Revision 6, dated April
 5, 1985.

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QAP 3.10 **REVISION 1** PAGE 4 OF 5

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CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

- Document Title/Number/Revision: 009-09592-062 Rev-01
- 1. Were the inputs correctly selected and incorporated into the design?
- 2. is the material presented sufficiently detailed as to purpose, method, assumptions,
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reversications when the detailed design activities are completed?
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- 13.

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- Have adequate maintenance features and requirements been specified? 14. Are accessibility and other design provisions adequate for performance of needed
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant ille?
- 16. Has the design properly considered radiation exposure to the public and plant

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EXHIBIT 3.10-1

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QAP 3.10 REVISION 1 PAGE 5 OF 5

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009-0PS 92-062 Revol 17. Are the acceptance criteria incorporated in the design documents sufficient to allow

- vertication that design requirements have been satisfactorily accomplished?
- 18. Have adequate pre-operational and subsequent periodic test requirements been ap-19.
- Are adequate handling, storage, cleaning and shipping requirements specified? 20.
- Are adequate identification requirements specified?
- Has an appropriate the page been used? 21.
- Are all pages sequentially numbered and marked with a valid number? 23
- is the presentation legible and reproducible?
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by
- 25. Are requirements for record preparation review, approval, retention, etc., adequately

Comments/Remarks:

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north Sun Independent Reviewer: Name/Signature/Date

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File No: 009-OPS92-095 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 03 Engineering Limit and Bases **PARAMETER:** Containment Hydrogen Concentration

PREPARED BY:	L. A. Wild		
•	Cognizant Engineer (Print Name)		
	K. q. Will	Date:	4/23/93
	Cognizant Engineer (Signature)		
		•	

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists NOY of QAM-101.

MARTIN GREER Name

anature

Independent Reviewer

APPROVED BY:

Cognizant Engineering Manager (Print Name) Cogni Engineering Manager (Signature) Dá

File No: 009-OPS92-095 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 03

Parameter: Containment Hydrogen Concentration

Step Value(s): Use(s):

< 4%

To determine if the hydrogen concentration requires the operator to go to the Functional Recovery EOI (> 4%).

< 4% To determine if hydrogen concentration requires the event to be re-diagnosed (\geq 4.0%).

< 4% To determine if the present CG control success path is adequate (hydrogen < 4%) or a different one must be used.

Engineering Limit(s):

48

Bases for Engineering Limit(s):

The 4% limit is based on the flammability limit of hydrogen (conservatively assuming a dry air environment), and the strategy for combustible gas control presented in References 1 and 2. The FSAR requires that the hydrogen recombiners be actuated at a hydrogen concentration of 2%. The EPGs recommend that the hydrogen recombiners be placed in service at a hydrogen concentration of 0.5%. The FSAR demonstrates that energization of the recombiners when the hydrogen concentration is at or below 2% ensures that the hydrogen concentration will not reach the flammable limit of 4%. Therefore, if containment hydrogen concentration reaches 4%, the current strategy for controlling combustible gases is not successful and further actions are required. Additionally, 4% is the limit at which the hydrogen recombiners must be secured. The recombination process occurs as a result of heating the process gases to an elevated temperature (reference 3). As this is not a catalytic process but a burn process, the elevated temperature could cause a hydrogen burn or an explosion if a recombiner is operated with a high hydrogen concentration in the containment. Therefore, at or above a containment hydrogen concentration of 4%, a combustible control method other than the hydrogen recombiners must be employed. | rev. 01

File No: 009-OPS92-095 Revision: 01 Page: 3 of 3

Assumptions:

1. In accordance with NES&L Quality Procedure S023-XXIV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1 and 3

| rev. 01

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2. The reference noted below is assumed to be Secondary Design documents. This assumption is justified based on the fact that they describe strategies which have been reviewed and commented on by the NRC.

Ref: 2

References:

- 1. Updated FSAR, through revision 8, Section 6.2.5.2.3.2.
- 2. "Emergency Procedure Guidelines," CEN-152, Revision 3, Bases for LOCA Steps 15, 17, 18 and SFSC 9 (EPG pages 5-95 through 98, 142 and 143).

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3. Updated FSAR, through revision 8, Section 6.2.5.3.A.

QAM-101

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checidist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checidist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision:

ASEA BROWN BOVEN

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- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions,
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda property identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- Have the design interface requirements been satisfied?
- 8. Was an appropriate design method used?
- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required ap-
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant He?
- 16. Has the design properly considered radiation exposure to the public and plant

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EXHIBIT 3.10-1

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File No: 009-OPS92-096 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 04 Engineering Limit and Bases PARAMETER: Containment Hydrogen Concentration

** * *

PREPARED BY:

		Engineer (Pr . G. W. J.) Engineer (Si	int Name) gnature)	Date: _	<u>4/23/93</u>
<u>VERIFICATI</u> The Safety document I Design Rev <u>MARTIN</u> Name Independen	-Related of has been w iew using (<u>CARR</u>	• •	ation conta De correct <u>D 9</u> of QAN	by means	this of 3

APPROVED BY:

11 Cognizant Engineering Manager (Print Name) Cognizant Engineering Manager (Signature)

29/93

File No: 009-0PS92-096 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 04

Parameter: Containment Hydrogen Concentration

Step Value(s): Use(s):

< 0.5% To confirm that an event other than an LOFW is not taking place.

Engineering Limit(s):

0%

Bases for Engineering Limit(s):

0% (actual) hydrogen is the normally expected concentration in containment. An event resulting in an increase in hydrogen concentration above the minimum detectible level is an indication that an event other than a LOFW (i.e. LOCA) is occurring (Ref. 1). The accuracy of the hydrogen monitoring subsystem is \pm 5% of the full scale reading of 10% (Ref 2). Therefore a concentration of \geq 0.5% would be a reliable indication that some hydrogen is present in the containment. 0.5% is therefore used in the LOFW EOI as the point for re-diagnosing the event.

Assumptions:

1. In accordance with NES&L Quality Procedure S023-XXIV-7-15, documents that are not Primary or Secondary Design documents may be used as reference documents if justification is provided. The reference noted below is formal engineering correspondence between the design principals (e.g., NSSS vendor architect, etc.) and SCE. Its use as reference material is justified when the basis for the engineering limit is "operational experience" or "engineering judgement", and no Primary or Secondary Design Document exists.

Ref: 1

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2. In accordance with NES&L Quality Procedure SO23-XXIV-7-15, the reference noted below is considered to be Secondary Design documents. Its use as a reference document for the engineering limit basis is assumed to be justified based on

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ensuring that the engineering limit is consistent with the current design basis and operating license.

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Ref: 2

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References:

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- SONGS "Emergency Procedure Technical Guidelines," Revision 01, June 1984, LOF Guideline, page 8-25.
- Updated FSAR, through Revision 8, Table 6.2-36, page 6.2-277.

	A BB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101	QAP 3.10 REVISION 1 PAGE 4 OF 5
	CHECKLIST NO. 9	
·	REVIEW OF OTHER DESIGN DOCUMENTS	
	Checklist 1 (Eurole 3.3-1 of OAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's evence.	and If applicable.
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QAP 3.10 **REVISION 1** PAGE 5 OF 5

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- Are the acceptance criteria incorporated in the design documents sufficient to allow 17. verification that design requirements have been satisfactorily accomplished?
- 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified?
- 19. Are adequate handling, storage, cleaning and shipping requirements specified?
- Are adequate identification requirements specified? 20.
- Has an appropriate the page been used? 21.
- Are all pages sequentially numbered and marked with a valid number? 22
- 23. is the presentation legible and reproducible?
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
- 25. Are requirements for record preparation review, approval, retention, etc., adequately

Comments/Remarks:

marter Su MANT NO 4/29/83 Independent Reviewer: Name/Signature/Date

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File No: 009-OPS92-088 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 05 Engineering Limit and Bases **PARAMETER:** Containment Hydrogen Concentration

PREPARED BY: Wild <u>A.</u> Cognizant Engineer (Print Name) Date: _4/28/97 Cognizant Engineer (Signature) VERIFICATION STATUS: COMPLETE The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $\frac{N \ge 9}{2}$ of QAM-101. MARTIN GRARR Name Signature Independent Reviewer APPROVED BY: 1.5 Cognazant Engineering Manager (Print Name)

Cognizant Engineering Manager (Signature)

File No: 009-OPS92-088 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 05

Parameter: Containment Hydrogen Concentration

Step Value(s): Use(s):

< 28

To determine if use of Hydrogen Recombiners is required to satisfy the present combustible gas (CG) control success path.

Engineering Limit(s):

3.5%

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Bases for Engineering Limit(s):

The engineering limit is based on ensuring that a single train of hydrogen removal equipment can remove hydrogen at a rate such that actuation of the system is not required until hydrogen is within 0.5% by volume of the limit (4.0%). This value is specified as 3.5%. (Reference 3.) While the FSAR (Ref.1) requires that the H₂ recombiners be actuated at a hydrogen concentration of 2% and the EPGs (Ref. 2) recommends that the H₂ recombiners be placed in service at a hydrogen concentration of 0.5%, placing the recombiners in service is not required until hydrogen concentration reaches 3.5 % (Ref. 3).

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Assumptions:

 In accordance with NES&L Quality Procedure S023-XXIV-7-15, the reference noted below is considered to be Secondary Design documents. Its use as a reference document for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1

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File No: 009-OPS92-088 Revision: 01 Page: 3 of 3

2. The reference noted below is assumed to be Secondary Design documents. This assumption is justified based on the fact that it describes strategies which have been reviewed and commented on by the NRC.

Ref: 2

| rev. 01

References:

- 1. Updated FSAR, through revision 8, Section 6.2.5.2.3.2.
- 2. "Emergency Procedure Guidelines," CEN-152, Revision 3, Bases for LOCA Steps 15, 17, 18 and SFSC 9 (EPG pages 5-95 through 98, 142 and 143).
- Southern California Edison calculation, Calculation Number N-4059-004, "Post LOCA Hydrogen Generation," including ICCN No. C-1, dated 2/5/93.

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QAP 3.10 **REVISION 1** PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checidist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checidist is used, and if applicable, the Independent Reviewer shall include it in the reviewer's statement.

Document Tale/Number/Revision: 009-0P592-088 1. Were the inputs correctly selected and incorporated into the design? ОК N/A 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed? 4. Are the appropriate quality and quality assurance requirements specified? Are the applicable codes, standards and regulatory requirements including issue and 5. addenda properly identified, and are their requirements for design met? Have applicable construction and operating experience been considered? 8 Have the design interface requirements been satisfied? 7. Was an appropriate design method used? 8 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly 10. Is the output (results and conclusions) reasonable compared to inputs? 11. Are the specified parts, equipment, and processes suitable for the required ap-Are the specified materials compatible with each other and the design environmental 12 conditions to which the material will be exposed? 13. Have adequate maintenance features and requirements been specified? 14. Are accessibility and other design provisions adequate for performance of needed 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant He? 16. Has the design properly considered radiation exposure to the public and plant

EXHIBIT 3.10-1

EXHIBIT 3.10-1

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ABB COMBUSTION ENGINEERING NUCLEAR POWER PAGE 5 OF 5 **REVISION** 1 QAP 3.10

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- Are the acceptance orderia incorporated in the design documents sufficient to allow vertication that design requirements have been satisfactorily accomplished?
- 18 Have adequate pre-operational and subsequent periodic test requirements been ap-
- ĕ Are adequate handling, storage, cleaning and shipping requirements specified?
- 8 Are adequate identification requirements specified?
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- Are requirements for record preparation review, approval, retention, etc., adequately

Comments/Remarks;

Independent Reviewer: Name/Signature/Date

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File No: 009-OPS92-097 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 06 Engineering Limit and Bases

PARAMETER: Containment Hydrogen Concentration

PREPARED BY:

L. A. Wild Cognizant Engineer (Print Name) Date: <u>4/24/93</u>

Cognizant Engineer (Signature)

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists <u>No 9</u> of <u>OAM-101</u>.

MARTIN CREER Name

Independent Reviewer

Signature

Date

APPROVED BY:

Cognizant Enginee ng Manager (Print Name) (Cognizant Engineering Manager (Signature)

File No: 009-0PS92-097 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 06

Parameter: Containment Hydrogen Concentration

Step Value(s): Use(s):

< 2% To evaluate the need to continue hydrogen purge operation.

> 2% To evaluate the need to continue hydrogen purge operation.

< 2% To determine if use of the Hydrogen Purge System is required to satisfy the present CG control success path.

< 4% To evaluate the need to continue hydrogen purge operation.

Engineering Limit(s):

3.5%

Bases for Engineering Limit(s):

The Engineering Limit is based on establishing the containment hydrogen concentration below the flammability limit of 4% (conservatively assuming a dry air environment). The FSAR (Ref.1) states, "In the extremely unlikely event that a LOCA occurs, and the redundant recombiners fail to function properly, the hydrogen purge subsystem may be utilized to control hydrogen concentration inside containment." It further states, "Calculations show that the hydrogen concentration will reach 3.5 vol % at approximately 14 days and that a 50 ft'/min (design flowrate) purge initiated at that time would ensure that the hydrogen concentration would remain below the 4 vol % level." Therefore, since the purging of any amount of containment atmosphere is undesirable, the operation of the hydrogen purge subsystem should only be required when it has been determined that the recombiners are inoperable and only then if hydrogen readout in the control room indicates that a hydrogen content of 3.5 vol % is exceeded. (Ref. 1)

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File No: 009-0PS92-097 Revision: 01 Page: 3 of 3

| rev. 01

Assumptions:

1. The Engineering Limit provides a reasonable target level for securing the purge system. The target level is low enough to ensure that levels are within the capability of the hydrogen recombiner. The target allows a margin to the combustible level to determine if the recombiner is can now effectively maintain hydrogen concentration. And, the level is high enough to minimize the amount of discharge to the environment necessary to lower hydrogen concentration to less than the combustible level.

2. In accordance with NES&L Quality Procedure S023-XXIV-7-15, the reference noted below is considered to be Secondary Design documents. Its use as a reference document for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

14

Ref: 1

References:

1. Updated FSAR, through revision 8, Section 6.2.5.3.B

QAP 3.10 **REVISION 1** PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: __ 009-0P592-097 Re-Ø

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions,
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda property identified, and are their requirements for design mat?
- Have applicable construction and operating experience been considered? 6
- 7.
- Have the design interface requirements been satisfied?
- 8. Was an appropriate design method used?

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- Have the adjustment factors, uncertainties, and empirical correlations been correctly 2
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required ap-
- 12. Are the specified meterials competible with each other and the design environmental conditions to which the material will be exposed?
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- Have adequate maintenance features and requirements been specified? 14. Are accessibility and other design provisions adequate for performance of needed
- Has adequate accessibility been provided to perform the in-service inspection 15. expected to be required during the plant ille?
- 16. Has the design properly considered radiation exposure to the public and plant

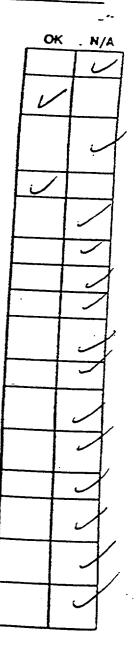


EXHIBIT 3.10-1

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QAP 3.10 **REVISION 1** PAGE 5 OF 5

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009-0P5 92-097 10-61 Are the acceptance criteria incorporated in the design documents sufficient to allow 17. verification that design requirements have been satisfactorily accomplished? 18. Have adequate pre-operational and subsequent periodic test requirements been ap-Are adequate handling, storage, cleaning and shipping requirements specified? 19. 20. Are adequate identification requirements specified? Has an appropriate the page been used? 21. Are all pages sequentially numbered and marked with a valid number? 22 23. Is the presentation legible and reproducible? 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by Are requirements for record preparation review, approval, retention, etc., adequately 25. Comments/Remarks:

MARTIN GREER- Marto Shen

Independent Reviewer. Name/Signature/Date

EXHIBIT 3.10-1

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File No: 009-0PS92-099 Revision: 01 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

Southern California Edison CLIENT: San Onofre 2&3 PLANT: PROJECT: ISOPS II Support C-E JOB NUMBER: 2001216

DOCUMENT: Module 04 Group 07 Engineering Limit and Bases **PARAMETER:** Containment Hydrogen Concentration

PREPARED BY:

Wild L. A. Cognizant Engineer (Print Name) Date: 4/23/93 Cognizant Engineer (Signature) VERIFICATION STATUS: COMPLETE The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists N_29 of QAM-101. MANTIN CREEP Name Signature Date Independent Reviewer

APPROVED BY:

Cognizant Engineering Manager (Print Name) Cognizant Engineering Manager (Signature)

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File No: 009-OPS92-099 Revision: 01 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 07

Parameter: Containment Hydrogen Concentration

Step Value(s): Use(s):

RISING To evaluate the need for hydrogen purge of containment.

Engineering Limit(s):

NONE

Bases for Engineering Limit(s):

There are no associated engineering limits for the trending of parameters. Since no value is specified in the trend, no value will be assigned to the engineering limit. Usually, when an operator is instructed to trend an indication, the indication is used in conjunction with other parameters to corroborate the condition of a safety function. An operator is not required to perform a safety related action based on the trending of a single (parameter by itself in the EOIs. Where the trending of a parameter is combined with specified operating limits on that parameter, the values given for the operating limits are evaluated for their engineering limits.

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Assumptions:

NONE

References:

NONE

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Tale/Number/Revision: 009-0PS92-09 ОК 1. Were the inputs correctly selected and incorporated into the design? N/A 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed? 4. Are the appropriate quality and quality assurance requirements specified? 5. Are the applicable codes, standards and regulatory requirements including issue, and addenda property identified, and are their requirements for design met? Have applicable construction and operating experience been considered? 6 7. Have the design interface requirements been satisfied? Was an appropriate design method used? 8 Have the adjustment factors, uncertainties, and empirical correlations been correctly Ω. 10. Is the output (results and conclusions) reasonable compared to inputs? Are the specified parts, equipment, and processes suitable for the required ap-11. 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed? 13. Have adequate maintenance features and requirements been specified? 14. Are accessibility and other design provisions adequate for performance of needed 10 Has adequate accessibility been provided to perform the in-service inspection 15. expected to be required during the plant life?

16. Has the design property considered radiation exposure to the public and plant personnel?

EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL

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QAP 3.10 REVISION 1 PAGE 5 OF 5

009-0P5 92-09.9 Revol 0K 17. Are the acceptance criteria incorporated in the design documents sufficient to allow R) verification that design requirements have been satisfactorily accomplished? 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified? 19. Are adequate handling, storage, cleaning and shipping requirements specified? 20. Are adequate identification requirements specified? 21. Has an appropriate the page been used? 22. Are all pages sequentially numbered and marked with a valid number? 23. Is the presentation legible and reproducible? 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change? 25. Are requirements for record preparation review, approval, retention, etc., adequately Comments/Remarks:

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Independent Reviewer: Name/Signature/Date

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EXHIBIT 3.10-1

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File No: 009-OPS92-091 Revision: 00 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 01 Engineering Limit and Bases PARAMETER: Containment Humidity

PREPARED BY: L. A. Wild Cognizant Engineer (Print Name) (1, WW)Date: 18/34/92Cognizant Engineer (Signature)

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists _9____ of QAM-101.

<u>Kenneth E. Faulkner</u> <u>K</u> Name Independent Reviewer

Kenneth E. Fay Signature

10/30/42 Date

APPROVED BY:

Cognia eering Manag Print Name)

ognizant Engineering Manager (Signature)

Date

File No: 009-OPS92-091 Revision: 00 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 01

Parameter: Containment Humidity

Step Value(s): Use(s):

NOT RISING To verify conditions inside containment to be normal.

Engineering Limit(s):

None

Bases for Engineering Limit(s):

There are no associated Engineering Limits for the trending of parameters. Since no value is specified in the trend, no value will be assigned to the engineering limit. Usually when an operator is instructed to trend an indication, the indication is used in conjunction with other parameters to corroborate the condition of a safety function. An operator is not required to perform a safety related action based on the trending of a single parameter by itself in the EOIS. Where the trending of a parameter, the values given for the operating limits on that for their engineering limits.

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Assumptions:

None

References:

None

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL OAM-101

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: Mod. 4 Group 1, Containment Humiclity/ 009-08592-091/Rev. 00

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda properly identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- 7. Have the design interface requirements been satisfied?
- 8. Was an appropriate design method used?
- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required application?
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair?
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?
- 16. Has the design properly considered radiation exposure to the public and plant personnel?

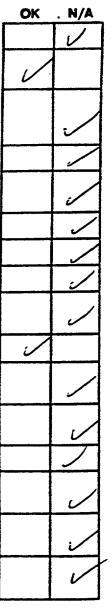


EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

QAP 3.10 REVISION 1 PAGE 5 OF 5

- 17. Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?
- 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified?
- 19. Are adequate handling, storage, cleaning and shipping requirements specified?
- 20. Are adequate identification requirements specified?
- 21. Has an appropriate title page been used?

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- 22. Are all pages sequentially numbered and marked with a valid number?
- 23. is the presentation legible and reproducible?
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
- 25. Are requirements for record preparation review, approval, retention. etc., adequately specified?

Comments/Remarks: None

Kenneth E. Fax Kner / Kenneth E. Faulkner / 10/30/42

independent Reviewer: Name/Signature/Date

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File No: 009-OPS92-046 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 01 Engineering Limit and Bases **PARAMETER:** Refueling Water Storage Tank Level

PREPARED BY:

L. A. Wild Cognizant Engineer (Print Name) Date: 1/28/97 Cognizant Engineer (Signature)

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $\frac{No 9}{0}$ of QAM-101.

TARTIN GREER Name

Signature

Independent Reviewer

APPROVED BY:

Cognizant Engineering Manager (Print Name) Cognizant Engineering Manager (Signature)

9/93

File No: 009-OPS92-046 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 01

Parameter: Refueling Water Storage Tank Level (RWST)

- Step Value(s): Use(s):
- > 19% To verify RWST level is above the RAS actuation setpoint (19% specified in the EOI, 18.5% nominal per Ref. 1 & 2).

< 19% To verify RWST level is less than the RAS actuation setpoint (19% specified in the EOI, 18.5% nominal per Ref. 1 & 2).

Engineering Limit(s):

Upper limit 26.8 % span Lower limit 11.0 % span

Bases for Engineering Limit(s):

The upper Engineering limit ensures that sufficient volume is transferred from the RWST and that 20 minutes of volume available in the RWST prior to RAS. The lower Engineering Limit ensures that sufficient volume remains to prevent air entrainment during the transfer of the pump suction from the RWST to the Containment Sump (Ref 1 & 2). Vortexing is not addressed by Reference 1. The calculation states that vortexes should not be a concern, but that this should be evaluated (Ref. 1, page 16).

11

Assumptions:

1. In accordance with NES&L Quality Procedure SO23-XXIV-7-15, the reference noted below is considered to be Secondary Design documents. Its use as a reference document for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

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File No: 009-OPS92-046 Revision: 01 Page: 3 of 3

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References:

1. Calculation 709783-MPS-5CALC-001, Rev. 00, dated 8/31/89, "SIS: RWST Volumes for Safety Injection and Containment Spray Modes of Operation"

2. Updated FSAR, through revision 8, Section 6.2.2.1.2.3.B. | rev. 01



ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: 009-0P592-046 12- \$1 ОК N/A 1. Were the inputs correctly selected and incorporated into the design? 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed? 4. Are the appropriate quality and quality assurance requirements specified? 5. Are the applicable codes, standards and regulatory requirements including issue and addenda property identified, and are their requirements for design met? Have applicable construction and operating experience been considered? 6 7. Have the design interface requirements been satisfied? 8. Was an appropriate design method used? Have the adjustment factors, uncertainties, and empirical correlations been correctly 2 1: 10. Is the output (results and conclusions) reasonable compared to inputs? r 11. Are the specified parts, equipment, and processes suitable for the required ap-12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed? 13. Have adequate maintenance features and requirements been specified? 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair? 14 15. Hiss adequate accessibility been provided to perform the in-service inspection expected to be required during the plant He? Has the design properly considered radiation exposure to the public and plant 16

EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL ASEA BROWN BONEN QAM-101

QAP 3.10 **REVISION 1** PAGE 5 OF 5

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009-0P5 92-046 Rev. 01 ÔK Are the acceptance criteria incorporated in the design documents sufficient to allow 17. verification that design requirements have been satisfactorily accomplished? Have adequate pre-operational and subsequent periodic test requirements been ap-18. propriately specified? Are adequate handling, storage, cleaning and shipping requirements specified? 19. Are adequate identification requirements specified? 20. Has an appropriate the page been used? 21. Are all pages sequentially numbered and marked with a valid number? 22. is the presentation legible and reproducible? 23 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change? 25. Are requirements for record preparation review, approval, retention. etc., adequately Comments/Remarks:

Ĉu. 4/19/93 last.

endent Reviewer. Name/Signature/Date

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File No: 009-OPS92-047 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 02 Engineering Limit and Bases PARAMETER: Refueling Water Storage Tank Level

PREPARED BY:

L. A. Wild Cognizant Engineer (Print Name) $- Q_{1} (W_{2})$ Cognizant Engineer (Signature) Date: $\frac{1}{2} \frac{1}{6} \frac{93}{12}$

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $N_0 9$ of QAM-101.

ARTIN GRACH Name

Signature

Date

Independent Reviewer

APPROVED BY:

Cognizant Engineering Manager (Print Name) Cognizant Engineering Manager (Signature)

File No: 009-OPS92-047 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 02

Parameter: Refueling Water Storage Tank Level

Step Value(s): Use(s):

> 2%

To determine when charging pump suction should be transferred to another borated water source, or to determine that they should be stopped.

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Engineering Limit(s):

> 4.65%

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Bases for Engineering Limit(s):

The Engineering Limit is based on ensuring that the RWST has a sufficient inventory to supply a source of water to the suction of the charging pumps. The level of the charging suction (CVCS gravity feed) from the RWST is 2 feet 1 inch above the tank bottom (Ref. 3). The piping is a nominal 6", therefore the top of the pipe would be 2 feet 4 inches or 2.333 feet. Unlike the safety injection pump suction, the CVCS suction line is flush with the inside tank wall (Ref. 4) The RWST bottom level tap is shown as 0.833 feet above the tank bottom (Ref. 1 and 5). The span of the level instrument is 32.25 feet (Ref. 1 and 2). Therefore the minimum level for the charging pumps would be 4.65% of span ([2.333 - 0.833] ÷ 32.25 X 100).

Assumptions:

None

References:

- 1. Calculation M12.1D, dated 5-23-84, "NPSH of ESF Pumps," SONGS File No. S023-451-A.
- 2. Calculation N-0240-006 R/O, dated 11-6-89, "RWST TECH SPEC REQUIREMENT."

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File No: 009-0PS92-047 Revision: 01 Page: 3 of 3

14

- з. Brown-Minneapolis Tank drawing 76-D108501-2, Revision 6, "Refueling Water Tank Orientation & Elevation", SONGS file #S023-407-13-54-7 SCE #0447. | rev. 01
- Brown-Minneapolis Tank drawing 76-B108501-18, Revision 0, "6" 4. CVCS Gravity Feed", SONGS file #S023-407-13-98-1 SCE #0447|. rev. 01
- Calculation S-PEC-393, Revision 00, 8/19/82, "SIS: RWST 5. Volume Required for Safety Injection and Containment Spray Modes of Operation" (CDCC #39507, Category 3, not releasable to SCE).

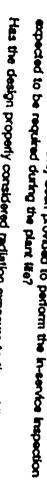
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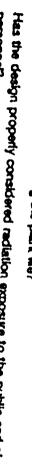
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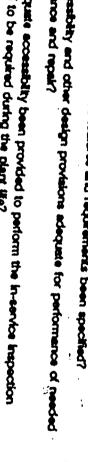




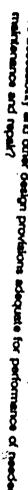
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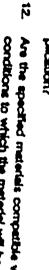




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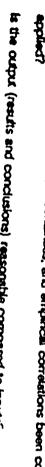
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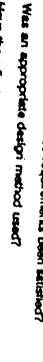
- conditions to which the material will be exposed?
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- Have adequate maintenance features and requirements been specified?
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- Are the specified parts, equipment, and processes suitable for the required ap-
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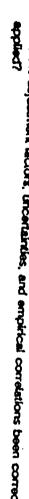
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- is the output (results and conclusions) reasonable compared to inputs;









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Were the inputs connectly selected and incorporated into the design?

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Document Title/Number/Revision:

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Checklist 1 (Edubit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable.

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<u>REVIEW OF OTHER DESIGN DOCUMENTS</u>

CHECKLIST NO. 9

QUALITY ASSURANCE PROCEDURES MANUAL

PAGE 4 OF **REVISION 1**

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QAP 3.10

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ABB COMBUSTION ENGINEERING NUCLEAR POWER

- (Ch Are the applicable codes, standards and regulatory requirements including issue and
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- Have the adjustment factors, uncertainties, and empirical correlations been correctly

- Have the design interface requirements been satisfied?

- revertications when the detailed design activities are completed? ind resonable? Where necessary, are the assumptions identified for subsequent
- Are the appropriate quality and quality assurance requirements specified?

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- Have applicable construction and operating experience been considered? iddenda properly identified, and are their requirements for design mar?

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QAP 3.10 REVISION 1 PAGE 5 OF 5

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17	Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?
18	Have adequate pre-operational and subsequent periodic test requirements been ap- propriately specified?
19.	Are adequate handling, storage, cleaning and shipping requirements specified?
20.	Are adequate identification requirements specified?
21.	•
22	Are all pages sequentially numbered and marked with a valid number?
23.	is the presentation legible and reproducible?
24.	Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
25.	Are requirements for record preparation review, approval, retention, etc., adequately specified?
Com	ments/Remarks:

MARTIN GRIE nartu Gier 4/29/93 Independent Reviewer: Name/Signature/Date

EXHIBIT 3.10-1

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File No: 009-0PS92-048 Revision: 01 1 of 3 Page:

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT: Southern California Edison PLANT: San Onofre 2&3 **PROJECT:** ISOPS II Support C-E JOB NUMBER: 2001216

DOCUMENT: Module 04 Group 03 Engineering Limit and Bases PARAMETER: Refueling Water Storage Tank Level

PREPARED BY: A. Wild Cognizant Engineer (Print Name) Date: 4/27/93 Cognizant Engineer (Signature) VERIFICATION STATUS: COMPLETE The Safety-Related design information contained in this

document has been verified to be correct by means of Design Review using Checklists No 9 of QAM-101.

Name

MARTIN GRARA Marta Sue Name Signature

Independent Reviewer

APPROVED BY:

11 Cognizant Engineering Manager (Print Name) Cognizant Engineering Manager (Signature)

File No: 009-0PS92-048 Revision: 01 Page: 2 of 3

SONGS 243 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 03

Parameter: Refueling Water Storage Tank Level

Step Value(s): Use(s):

FALLING

To verify the emergency sump level increases as the RWST level decreases.

LOWERING To verify the emergency sump level increases as the RWST level decreases.

LOWERING To verify that RWST level is falling.

Engineering Limit(s):

None

Bases for Engineering Limit(s):

There are no associated Engineering Limits for the trending of parameters. Since no value is specified in the trend, no value will be assigned to the engineering limit. Usually when an operator is instructed to trend an indication, the indication is used in conjunction with other parameters to corroborate the condition of a safety function. An operator is not required to perform a safety related action on the trending of a single parameter by itself in the EOIs. Where the trending of a parameter is combined with specified operating limits on that parameter, the values given for the operating limit are evaluated for their engineering limits.

If the RWST level reaches the Recirculation Actuation Signal (RAS) setpoint, then the valves from the containment sump will be opened. Upon confirmation that the sump level is sufficient to provide adequate suction head, the operators will shut the supply from the RWST (Ref. 1). Confirmation that the RWST Level is FALLING or LOWERING as Containment Sump level increases ensures that the water removed from the RWST by the Safety Injection and/or Containment Spray pump(s) is being transferred to the Containment Sump to eventually provide the required suction head If the Step Value is not observed, then the operators are directed to ensure that adequate level is maintained in the RWST to provide suction to the running pumps.

File No: 009-0PS92-048 Revision: 01 Page: 3 of 3

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Assumptions:

1. In accordance with NES&L Quality Procedure S023-XXIV-7-15, the reference noted below is considered to be Secondary Design documents. Its use as a reference document for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1

| rev. 01

References:

1. Updated FSAR, through revision 8, Section 6.2.2.1.2.3.B.

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL **QAM-101**

QAP 3.10 **REVISION 1** PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision:

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- 1. Were the inputs correctly selected and incorporated into the design? 2 is the material presented sufficiently detailed as to purpose, method, assumptions,
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- Are the applicable codes, standards and regulatory requirements including issue and 5. addenda property identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- Have the design interface requirements been satisfied? 7.
- Was an appropriate design method used? 8
- Have the adjustment factors, uncertainties, and empirical correlations been correctly ٤.
- is the output (results and conclusions) reasonable compared to inputs? 10.
- 11. Are the specified parts, equipment, and processes suitable for the required ap-
- Are the specified materials compatible with each other and the design environmental 12 conditions to which the material will be exposed?
- 13.
- Have adequate maintenance features and requirements been specified? 14,
- Are accessibility and other design provisions adequate for performance of needed
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?
- 16. Has the design property considered radiation exposure to the public and plant

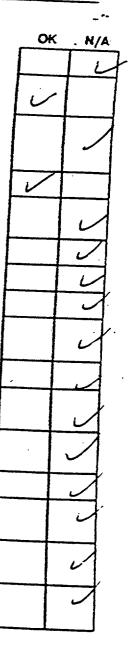


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VARTIN CREKR Marty Cur 4/28/53	Comments/Remarks:	 25. Are requirements for record preparation review, approval, retention, etc., adequately specified? 	 Are all pages sequentially numbered and marked with a valid number? Is the presentation legible and reproducible? Here a 	 Are adequate identification requirements specified? Are adequate identification requirements specified? Has an appropriate the page been used? 	 Have adequate pre-operational and subsequent periodic test requirements been ap- propriately specified? Are adequate handling storage damage damage in the second storage damage.
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QAP 3.10 REVISION 1 PAGE 5 OF 5 8 9

ABB COMBUSTION ENGINEERING NUCLEAR POWER

QUALITY ASSURANCE PROCEDURES MANUAL QAM-101 00% 02 22-648 Per Qu

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File No: 009-OPS92-100 Revision: 01 Page: 1 of 3

Date: 1/5/93

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 04 Engineering Limit and Bases **PARAMETER:** Refueling Water Storage Tank Level

PREPARED BY:

L. A. Wild Cognizant Engineer (Print Name)

Cognizant Engineer (Signature)

VERIFICATION STATUS: COMPLETEThe Safety-Related design information contained in this
document has been verified to be correct by means of
Design Review using Checklists 9 of QAM-101.Paol B. Kramarchy LPall B. Kramarchy LPaol B. Kramarchy LPall B. Kramarchy LNameSignatureIndependent Reviewer

APPROVED BY:

Cognizant Engi ng Manager (Print Name) Cognizant Engineering Manager (Signature)

File No: 009-OPS92-100 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 04

Parameter: Refueling Water Storage Tank Level

Step Value(s): Use(s):

> 6%

To determine when charging pump suction should be transferred to another borated water source, or to determine that they should be stopped.

> 6% To verify RWST level is available (> 6%) as a water source for the charging pumps or ECCS pumps.

> 6% To determine the availability of alternate borated water sources.

Engineering Limit(s):

Lower Limit Safety Injection Pumps > 0.26%

Lower Limit Charging Pumps > 4.65%

Bases for Engineering Limit(s):

The Engineering limit is based on having sufficient water in the RWST to provide suction to the SI and/or charging pumps.

Safety Injection Pumps

Reference 1 (page 12 of 25) specifies that the water level in the RWST can be drawn down to the top of the grating on the ECCS suction nozzle when supplying the ESF pumps. This level is indicated as being 0.917 feet above the tank bottom. The RWST bottom level tap is shown as 0.833 feet above the tank bottom. The span of the level instrument is 32.25 feet (Ref. 1 and 2). Therefore the minimum level for the safety injection pumps would be 0.26% of span ([0.917 - 0.833] \div 32.25 X 100).

Charging Pumps

The level of the charging suction (CVCS gravity feed) from the RWST is 2 feet 1 inch above the tank bottom (Ref. 3). The piping

File No: 009-OPS92-100 Revision: 01 Page: 3 of 3

is a nominal 6", therefore the top of the pipe would be 2 feet 4 inches or 2.333 feet. Unlike the safety injection pump suction, the CVCS suction line is flush with the inside tank wall (Ref. 4) The RWST bottom level tap is shown as 0.833 feet above the tank bottom (Ref. 1 and 5). The span of the level instrument is 32.25 feet (Ref. 1 and 2). Therefore the minimum level for the charging pumps would be 4.65% of span ([2.333 - 0.833] \div 32.25 X 100).

Assumptions:

1. The suction to the CVCS pumps will be maintained down to the top of the CVCS gravity feed line.

References:

- 1. Calculation M12.1D, dated 5-23-84, "NPSH of ESF Pumps," SONGS File No. S023-451-A.
- 2. Calculation N-0240-006 R/O, dated 11-6-89, "RWST TECH SPEC REQUIREMENT."
- 3. Brown-Minneapolis Tank drawing 76-D108501-2, Revision 6, "Refueling Water Tank Orientation & Elevation", SONGS file #S023-407-13-54-7 SCE #0447.
- 4. Brown-Minneapolis Tank drawing 76-B108501-18, Revision 0, "6" CVCS Gravity Feed", SONGS file #S023-407-13-98-1 SCE #0447.
- 5. Calculation S-PEC-393, Revision 00, 8/19/82, "SIS: RWST Volume Required for Safety Injection and Containment Spray Modes of Operation" (CDCC #39507, Category 3, not releasable to SCE)

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL OAM-101

QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: ISOPS Module Ø8 Group Ø4 File#009-0PS92-100 (Revol)

1. Were the inputs correctly selected and incorporated into the design?

- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
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- 9. Was an appropriate design method used?
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- 11. Are the specified parts, equipment, and processes suitable for the required application?
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair?
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant Hie?
- 16. Has the design properly considered radiation exposure to the public and plant personnel?

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EXHIBIT 3.10-1

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QAP 3. REVISION PAGE 5 OF

> Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished? 17.

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- Have adequate pre-operational and subsequent periodic test requirements been approprietaly specified? **1**8
- Are adequate handing, storage, cleaning and shipping requirements specified? ğ
 - 20. Are adequate identification requirements specified?
- 21. Has an appropriate the page been used?
- Are all pages sequentially numbered and marked with a valid number? 8

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- 23. Is the presentation legible and reproducible?
- Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change? ž
- Are requirements for record preparation review, approval, retention. etc., adequately specified? ĸ

Comments/Remarks:

5-53 Ta 08 Independent Reviewer: Name/Standauye/Date B. Kramerchy 100

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File No: 009-OPS92-101 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 05 Engineering Limit and Bases **PARAMETER:** Refueling Water Storage Tank Level

<u>VERIFICATION STATUS: COMPLETE</u> The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $\frac{N_0}{2}$ of QAM-101.

MARSIN GREER Name Independent Reviewer

Signature

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APPROVED BY:

engler Cognizant Engineering Manager (Print Name)

Cognizant/Engineering Manager (Signature)

<u>4/29/93</u> Dete

File No: 009-0PS92-101 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 05

Parameter: Refueling Water Storage Tank Level

Step Value(s): Use(s):

> 19%

To determine if the RWST level is adequate to supply the containment spray pumps (> 19%).

MAINTAIN > 19% To determine if the RWST level is adequate to supply the containment spray pumps (> 19%).

> 19%

To verify sufficient RWST level to start emergency boration with ECCS pumps.

| rev. 01

Engineering Limit(s):

> 0.26%

Bases for Engineering Limit(s):

Reference 1 (page 12 of 25) specifies that the water level in the RWST can be drawn down to the top of the grating on the ECCS suction nozzle. This level is indicated as being 0.917 feet above the tank bottom. The RWST bottom level tap is shown as instrument is 32.25 feet (Ref. 1 and 2). Therefore the minimum ([0.917 - 0.833] \div 32.25 X 100).

The step value specified in the procedure is the nominal RAS setpoint (Ref. 3) conservatively rounded off in the EOIs (Ref. 4). When RAS occurs, the suction source is shifted to the containment sump. The EOIs indicate that suction should not be shifted to the sump if sufficient level does not exist in the sump to provide a net positive suction head to the pumps. Ensuring or maintaining the level in the RWST provides a suction to the Containment Spray pump(s) while they are taking a suction from this source until suction from another source is available. However, as noted above the level in the RWST can be as low as 0.26% (0.917 feet) and still maintain suction to the pumps.

File No: 009-OPS92-101 Revision: 01 Page: 3 of 3

Assumptions:

1. In accordance with NES&L Quality Procedure S023-XXIV-7-15, the reference noted below is considered to be Secondary Design documents. Its use as a reference document for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 3

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2. The reference noted below is assumed to be Secondary Design documents. This assumption is justified based on the fact that it describes strategies which have been reviewed and commented on by the NRC.

Ref: 4

References:

- Calculation M12.1D, dated 5-23-84, "NPSH of ESF Pumps," SONGS File No. S023-451-A.
- 2. Calculation N-0240-006 R/O, dated 11-6-89, "RWST TECH SPEC REQUIREMENT."
- 3. Table 3.3-4 of SONGS 2 Technical Specifications, through Amendment 94, June 3, 1991, and SONGS 3 Technical Specifications, through Amendment 84, June 3, 1991.
- 4. Operating Instruction S023-14-9, Bases for Success Path IC-2, Step 1.a and CTP-3, Step 1.c.

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: 009-0P592-101 Rev \$1 1. Were the inputs correctly selected and incorporated into the design? OK N/A 2. is the material presented sufficiently detailed as to purpose, method, assumptions, 1 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed? Are the appropriate quality and quality assurance requirements specified? 4. 5. Are the applicable codes, standards and regulatory requirements including issue and مة addends properly identified, and are their requirements for design met? 6. Have applicable construction and operating experience been considered? Have the design interface requirements been satisfied? L 8. Was an appropriate design method used? 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly is the output (results and conclusions) reasonable compared to inputs; 10. 11. Are the specified parts, equipment, and processes suitable for the required ap-12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed? 13. Have adequate maintenance features and requirements been specified? 14. Are accessibility and other design provisions adequate for performance of needed Has adequate accessibility been provided to perform the in-service inspection 15. expected to be required during the plant He? Has the design properly considered radiation exposure to the public and plant 16. Ĺ

EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL

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QAP 3.10 **REVISION 1** PAGE 5 OF 5

009-0P5 92-101 Der \$1 Are the acceptance criteria incorporated in the design documents sufficient to allow 17. ÔK vertication that design requirements have been satisfactorily accomplished? 18. Have adequate pre-operational and subsequent periodic test requirements been ap-19. Are adequate handling, storage, cleaning and shipping requirements specified? 20. Are adequate identification requirements specified? Has an appropriate the page been used? 21. Are all pages sequentially numbered and marked with a valid number? 22. is the presentation legible and reproducible? 23. 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by 25. Are requirements for record preparation review, approval, retention, etc., adequately Comments/Remarks:

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Independent Reviewer: Name/Signature/Date

EXHIBIT 3.10-1

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File No: 009-0PS92-102 Revision: 00 1 of 2 Page:

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT: Southern California Edison PLANT: San Onofre 2&3 **PROJECT:** ISOPS II Support C-E JOB NUMBER: 2001216

DOCUMENT: Module 04 Group 06 Engineering Limit and Bases Refueling Water Storage Tank Level **PARAMETER:**

PREPARED BY: Wild Cognizant/Engineer (Print Name) U) Date: 11/2 Cognizant Engineer (Signature)

VERIFICATION STATUS: COMPLETE

Cognizar

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists _____ of QAM-101.

Kenneth E. Faulkner Kenneti E. Falkner	11/2/42
Name	Date
Independent Reviewer	

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APPROVED BY:

1.1 1**06** E Coglizant Engineering Manager (Print Name)

Engineering Manager (Signature)

 File No:
 009-OPS92-102

 Revision:
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 Page:
 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 06

Parameter: Refueling Water Storage Tank Level

Step Value(s): Use(s):

> 68

To determine if it is necessary (at 6% level) to initiate makeup water to the RWST.

14

Engineering Limit(s):

> 0.26%

Bases for Engineering Limit(s):

Reference 1 (page 12 of 25) specifies that the water level in the RWST can be drawn down to the top of the grating on the ECCS suction nozzle. This level is indicated as being 0.917 feet above the tank bottom. The RWST bottom level tap is shown as 0.833 feet above the tank bottom. The span of the level instrument is 32.25 feet (Ref. 1 and 2). Therefore the minimum level for the safety injection pumps would be 0.26% of span $([0.917 - 0.833] \div 32.25 \times 100).$

The EOI steps which use this value involve ensuring that adequate suction is maintained to ESF pumps. As noted above, level above the grating is sufficient to meet this criteria.

Assumptions:

None

References:

- Calculation M12.1D, dated 5-23-84, "NPSH of ESF Pumps," SONGS File No. S023-451-A.
- 2. Calculation N-0240-006 R/O, dated 11-6-89, "RWST TECH SPEC REQUIREMENT."

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL OAM_101

QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: Mod 4 Group 6 RWST Level / 004-08592-102/Rev.00

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda properly identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- 7. Have the design interface requirements been satisfied?
- 8. Was an appropriate design method used?
- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required application?
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair?
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?
- 16. Has the design properly considered radiation exposure to the public and plant personnel?

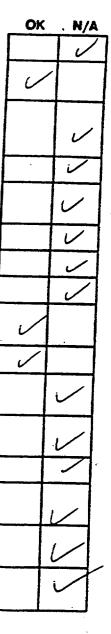


EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL

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QAP 3.10 REVISION 1 PAGE 5 OF 5

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- Are the acceptance criteria incorporated in the design documents sufficient to allow 17. verification that design requirements have been satisfactorily accomplished?
- Have adequate pre-operational and subsequent periodic test requirements been ap-18.
- Are adequate handling, storage, cleaning and shipping requirements specified? 19.
- Are adequate identification requirements specified? 20.
- 21. Has an appropriate title page been used?

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- Are all pages sequentially numbered and marked with a valid number? 22
- 23. is the presentation legible and reproducible?
- Have all cross-outs or overstrikes in the documentation been initialed and dated by 24.
- Are requirements for record preparation review, approval, retention. etc., adequately 25.

Comments/Remarks: As marked on Document Comments Sheet.

Kenneth E. Faulkner / Kenneth E. Faulkener /11/2/92

Independent Reviewer: Name/Signature/Date

EXHIBIT 3.10-1

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File No:009-OPS92-098Revision:00Page:1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 04 Group 07 Engineering Limit and Bases **PARAMETER:** Refueling Water Storage Tank Level

PREPARED BY: L. A. Wild Cognizant Engineer (Print Name) $\frac{1}{2}$ Date: $\frac{11/2}{92}$ Cognizant Engineer (Signature)

<u>VERIFICATION STATUS: COMPLETE</u> The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists <u>9</u> of QAM-101.

Kenneth E. Faxikner Name Signature Independent Reviewer

APPROVED BY:

Print Name) ognizant Ingineering Manager (Signature)

File No: 009-OPS92-098 Revision: 00 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 04

Group: 07

Parameter: Refueling Water Storage Tank Level

Step Value(s): Use(s):

> 2%

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To determine if RWST level is adequate when the ECCS pumps are aligned to take suction from the RWST.

12

Engineering Limit(s):

> 0.26%

Bases for Engineering Limit(s):

Reference 1 (page 12 of 25) specifies that the water level in the RWST can be drawn down to the top of the grating on the ECCS suction nozzle. This level is indicated as being 0.917 feet above the tank bottom. The RWST bottom level tap is shown as 0.833 feet above the tank bottom. The span of the level instrument is 32.25 feet (Ref. 1 and 2). Therefore the minimum level for the safety injection pumps would be 0.26% of span $([0.917 - 0.833] \div 32.25 \times 100)$.

The EOI steps which use this value involve ensuring that adequate suction is maintained to ECCS pumps. As noted above, level above the grating is sufficient to meet this criteria.

Assumptions:

None

References:

- 1. Calculation M12.1D, dated 5-23-84, "NPSH of ESF Pumps," SONGS File No. S023-451-A.
- 2. Calculation N-0240-006 R/O, dated 11-6-89, "RWST TECH SPEC REQUIREMENT."

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL **OAM-101**

QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: Mod. 4 Group 7 RWST Level 009-0P592-098/Rev.00 -

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda properly identified, and are their requirements for design met?
- Have applicable construction and operating experience been considered?.
- Have the design interface requirements been satisfied? 7.
- 8. Was an appropriate design method used?

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- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- Are the specified parts, equipment, and processes suitable for the required ap-11.
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- Have adequate maintenance features and requirements been specified? 13.
- Are accessibility and other design provisions adequate for performance of needed 14. maintenance and repair?
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?
- 16. Has the design properly considered radiation exposure to the public and plant

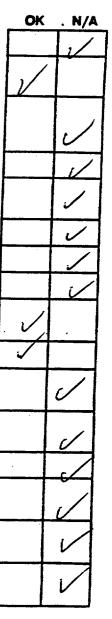


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- Have adequate pre-operational and subsequent periodic test requirements been appropriately specified? **1**8
 - Are adequate handling, storage, cleaning and shipping requirements specified? **1**8

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- 20. Are adequate identification requirements specified?
- 21. Has an appropriate this page been used?
- Are all pages sequentially numbered and marked with a valid number? କ୍ଷ
 - 23. Is the presentation legible and reproductble?
- Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change? 2
- Are requirements for record preparation review, approval, retention. etc., adequately specified? શ્વં

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Kennet Independent Reviewer: Name/Signature/Date Kenneth E. Faulkner

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EXHIBIT 3.10-1

File No: 009-OPS92-146 Revision: 01 Page: 1 of 13

ABB COMBUSTION ENGINEERING INSTRUMENT USE AND BASES TABLE COVER SHEET

CLIENT:	Southern California Edison	<u>PLANT:</u> San Onofre 2&3
PROJECT:	ISOPS II Support	C-E JOB NUMBER: 2001216
MODULE:	05 Containment Pressure Containment Temperature Containment Spray Flow	
PREPARED	BY: John Flaherty Cognizant Engineer (Pri Cognizant Engineer (Sig	Date: 4/72/53
docume	ICATION STATUS: COMPLETE afety-Related design informat ent has been verified to be a Review using Checklists <u>M</u>	
	TIN GALEN <u>Matt</u> Signature Endent Reviewer	<u> Him 4/28/93</u> Date
APPROVED B	Y: <u>J.R. Congdon</u> Cognizant Engineering Ma	nager (Print Name)
	Cognizant Engineering Ma	mager (Signature) Pate

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File No:009-OPS92-146Revision:01Page:2 of 13

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RECORD OF REVISIONS

<u>Rev</u>	Date	Pages	Prepared by	Reviewed by	Approved by
00	11/06/92	ALL	W. Dawes	P.Kramarchyk	J.R.Congdon
01	04/28/93	ALL	J. Flaherty	M.Greer	J.R.Congdon

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OCUMENT NO: 009-0PS92-146 AGE NO: 3 OF 13 • .

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SONGS 2/3 ISOP 11 PHASE 11 INSTRUMENT USE AND BASES TABLE

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1	STEP VALUE/			1
iRP	PARAMETER	ENG. LIMIT	BASES	USE
01	CONTINT PRESSURE	< 1.5 PS1G 1.5 PS1G	This value was selected to verify that contmt pressure remains below the upper limit for normal contmt pressure. 1.5 PSIG coincides with the upper limit for T.S. 3.6.1.4 LCO for contmt pressure, which along with CR alarms, defines normal contmt pressure	To verify expected post-trip containment pressure conditions.
01	CONTMT PRESSURE	< 1.5 PSIG 1.5 PSIG	This value was selected to verify that contmt pressure remains below the upper limit for normal contmt pressure. 1.5 PSIG coincides with the upper limit for T.S. 3.6.1.4 LCO for contmt pressure, which along with CR alarms, defines normal contmt pressure	To confirm that an event other than an LOFW is not taking place.
01 	CONTINT PRESSURE	< 1.5 PSIG 1.5 PSIG	This value was selected to verify that contmt pressure remains below the upper limit for normal contmt pressure. 1.5 PSIG coincides with the upper limit for T.S. 3.6.1.4 LCO for contmt pressure, which along with CR alarms, defines normal contmt pressure	To verify Containment Pressure < 1.5 PSIG and direct event re-diagnoses if it is not.
 50 	CONTMT PRESSURE	> 14 PSIG UL 14 PSIG	14 psig is based on the ESFAS trip value for the CSAS. The trip value was established based on the 20 psig setpoint used in the safety analysis, with a 6 psi channel accuracy factor included.	To verify CSAS actuation.
02	CONTMT PRESSURE	< 14 PSIG Ul 14 PSIG	14 psig is based on the ESFAS trip value for the CSAS. The trip value was established based on the 20 psig setpoint used in the safety analysis, with a 6 psi channel accuracy factor included.	To determine if CSAS has actuated or should have actuated.
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DATE: 04/28/93 SONGS 2/3 ISOP 11 PHASE 11 CUMENT NO: 009-0PS92-146 **REVISION: 01** \GE NO: 4 OF 13 INSTRUMENT USE AND BASES TABLE NOT A Q.A. DOCUMENT Module #: 05 IT A Q.A. DOCUMENT STEP VALUE/ USE ENG. LIMIT BASES PARAMETER ۲S To determine if CSAS has actuated or should have > 14 PSIG 14 psig is based on the ESFAS trip value for the CSAS. J2 | CONTNT PRESSURE The trip value was established based on the 20 psig actuated. **UL 14 PSIG** setpoint used in the safety analysis, with a 6 psi channel accuracy factor included. To verify Containment Pressure < 14 PSIG and not < 14 PSIG NOT INC | 14 psig is based on the ESFAS trip value for the CSAS. CONTINT PRESSURE)2 The trip value was established based on the 20 psig increasing and rediagnose the event if it is not. UL 14 PSIG setpoint used in the safety analysis, with a 6 psi channel accuracy factor included. To evaluate the need to initiate containment spray 14 psig is based on the ESFAS trip value for the CSAS. < 14 PSIG)2 | CONTINT PRESSURE The trip value was established based on the 20 psig operation. UL 14 PSIG setpoint used in the safety analysis, with a 6 psichannel accuracy factor included. To evaluate the need to initiate containment spray There are no engineering limits for the trending or STABLE OR LOWRING)2 CONTINT PRESSURE monitoring of parameters. Since no value is specified operation. NONE in the trend, no engineering limits apply. 14 psig is based on the ESFAS trip value for the CSAS. To determine if event re-diagnosis is required. < 14 PSIG 02 | CONTINT PRESSURE The trip value was established based on the 20 psig UL 14 PSIG

setpoint used in the safety analysis, with a 6 psi

channel accuracy factor included.



OCUMENT NO: 009-0PS92-146 AGE NO: 5 OF 13

SONGS 2/3 ISOP II PHASE II INSTRUMENT USE AND BASES TABLE

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DATE: 04/28/93 REVISION: 01

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Module #: 05

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RP	PARAMETER	STEP VALUE/ ENG. LINIT	BASES	l Use
02	CONTMT PRESSURE	CONSTNT OR LOWRNG None	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To determine if containment pressure is constant or Lowering and if it is not, to direct use of another success path.
03	CONTMT PRESSURE	> 3.4 PSIG UL 3.4 PSIG	3.4 PSIG is coincident with and therefore based on the ESFAS trip value.	To verify CIAS actuation if containment pressure is >3.4 PSIG.
03	CONTMT PRESSURE	> 3.4 PSIG UL 3.4 PSIG	3.4 PSIG is coincident with and therefore based on the ESFAS trip value.	To verify CCAS actuation if containment pressure is >3.4 PSIG.
)3	CONTMT PRESSURE	< 3.4 PSIG UL 3.4 PSIG	3.4 PSIG is coincident with and therefore based on the ESFAS trip value.	To determine if containment pressure < CIAS setpoint or verify CIAS actuation if > setpoint.
)3 .	CONTINT PRESSURE	< 3.4 PSIG UL 3.4 PSIG	3.4 PSIG is coincident with and therefore based on the ESFAS trip value.	To determine if containment pressure < SIAS setpoint or verify SIAS actuation if > setpoint.
)3	CONTNT PRESSURE	< 3.4 PSIG UL 3.4 PSIG	3.4 PSIG is coincident with and therefore based on the ESFAS trip value.	To verify CIAS actuation if containment pressure is >3.4 PSIG.
)3 	CONTMT PRESSURE	> 3.4 PSIG UL 3.4 PSIG 	3.4 PSIG is coincident with and therefore based on the ESFAS trip value.	To determine if containment pressure < CIAS setpoint or verify CIAS actuation if > setpoint.
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SONGS 2/3 ISOP 11 PHASE 11 INSTRUMENT USE AND BASES TABLE

DATE: 04/28/93 REVISION: 01

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P	PARAMETER	STEP VALUE/ ENG. LIMIT	BASES	USE
-3	CONTINT PRESSURE	< 3.4 PSIG UL 3.4 PSIG	3.4 PSIG is coincident with and therefore based on the ESFAS trip value.	To determine if containment pressure is less than the CIAS setpoint and determine the appropriate success path to be used.
· 3	CONTMT PRESSURE	> 3.4 PSIG UL 3.4 PSIG	3.4 PSIG is coincident with and therefore based on the ESFAS trip value.	To evaluate the need for manual containment isolation.
13	CONTMT PRESSURE	< 3.4 PS1G UL 3.4 PS1G	 3.4 PSIG is coincident with and therefore based on the ESFAS trip value. 	To evaluate the need for containment isolation.
14	CONTMT PRESSURE	< 14 PSIG UL 15 PSIG	15 PSIG is based on the T.S. ALLOWABLE VALUE for CSAS. The CS system may be secured, and the CSAS reset when contmt pressure is reduced to <=25% (15 PSIG) of design contmt pressure (60 psig). The fan coolers are then capable of further lowering pressure	To evaluate containment spray termination.
15	CONTINT PRESSURE	INCREASING NONE	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To identify the type of event and location when Pressurizer Pressure is rapidly decreasing, using the "Break identification Chart".
ю	CONTAT PRESSURE	< 1.5 PSIG UL 1.5 PSIG 	This pressure coincides with the T.S limit on containment pressure. It defines the upper limit for normal containment pressure. 1.5 psig is based on engineering judgement as the maximum pressure which will be observed with no energy release to contmt.	To determine if containment conditions indicate an event other than SGTR is in progress.

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۶P	PARAMETER	STEP VALUE/ ENG. LIMIT	BASES	USE
37	CONTHT PRESSURE	<pre>< CCW PRESSURE NONE </pre>	There are no associated engineering limits for the comparison of parameters. Since no value is specified in the comparison, no value can be assigned to the engineering limit.	To compare containment pressure with CCW pressure prior to, or after restoring CCW to the containment.
38	CONTHT PRESSURE	<pre>< 3.4 PSIG Limit Not Entered</pre>	Bases data not yet available.	To confirm that an event other than an LOFW is not taking place.
)9 	CONTMT PRESSURE	NOT RISING None	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To verify conditions inside containment to be normal.
10	CONTINT PRESSURE	> 14 PSIG N/A	Use of the Mini-Purge System to vent containment in the event that the CS system does not operate is no longer applicable to the EOIs. SCE has directed that ABB-CE need not address this issue in this study.	To evaluate the effectiveness of the present success path for control of containment temperature and pressure.
 0 	CONTMT PRESSURE	RISING N/A	Use of the Mini-Purge System to vent containment in the event that the CS system does not operate is no longer applicable to the EOIs. SCE has directed that ABB-CE need not address this issue in this study.	To evaluate the effectiveness of the present success path for control of containment temperature and pressure.
10 	CONTMT PRESSURE	STABLE OR LOWRNG N/A	Use of the Mini-Purge System to vent containment in the event that the CS system does not operate is no longer applicable to the EOIs. SCE has directed that ABB-CE need not address this issue in this study.	To evaluate the effectiveness of the present success path for control of containment temperature and pressure.

CUMENT NO: 009-0PS92-146

SONGS 2/3 ISOP II PHASE II INSTRUMENT USE AND BASES TABLE

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DATE: 04/28/93 REVISION: 01

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Module #: 05

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₹ P	PARANETER	STEP VALUE/ Eng. Limit	BASES	USE
11	CONTMT PRESSURE	< 14 PSIG UL 14 PSIG	14 PSIG is determined to be the engineering limit because it coincides with the ESFAS trip value. 14 psig is sufficiently high to prevent inadvertent actuation of the CS system, but low enough to minimize starting delay time.	To indicate if containment spray (and/or emergency fans) should be operating based on containment pressure.
2	CONTMT PRESSURE	< 3.4 PSIG UL 3.4 PSIG	3.4 PSIG is coincident with and therefore based on the ESFAS trip value.	To verify expected post-trip containment pressure conditions.
3	CONTMT PRESSURE	CONSTANT OR LOWER	Use of the Mini-Purge System to vent containment in the event that the CS system does not operate is no longer applicable to the EOIs. SCE has directed that ABB-CE need not address this issue in this study.	To determine if the containment purge success path is performing adequately by observing containment pressure constant or lowering.
4	CONTMT PRESSURE	STABLE OR LOWERIN NONE	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To determine if containment pressure is stable or lowering in order to allow continued use of the present success path, or direct the operator to a different success path.
5 5	CONTMT PRESSURE	CONSTHT, STØL; LVRG NONE	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To evaluate the effectiveness of the present success path for control of containment temperature and pressure.

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-	TENT NO: 009-0P592-146 NO: 9 OF 13		SONGS 2/3 ISOP II PHASE II INSTRUMENT USE AND BASES TABLE		DATE: 04/28/93 Revision: 01
<u>01</u>	Q.A. DOCUMENT		Module #: 05	•	NOT A Q.A. DOCUMENT
iRP	PARAMETER	STEP VALUE/ ENG. LIMIT	BASES	l USE	
16	CONTMT PRESSURE	< 3.4 PSIG 9.2 PSIG	The engineering limit is based on the maximum expected containment pressure during a SBO with a four hour duration. In this case, containment pressure increasing to > 9.2 PSIG is an indication that an event other than an SBO is occurring.	To determine if event re-diagnosi performance of the SBO procedure.	
01	CONTHT SPRAY FLOW	> 1750 GPM 1750 GPM	1750 GPM is the value of CS flow assumed in the Containment Peak Pressure Analysis for the containment design basis accident. This value is the minimum acceptable value for a single train of CS. 1750 gpm CS + two containment Fan Coolers is acceptable.	To determine if containment spray meet SFSC criteria (> 1750 gpm pe	
01	CONTHT SPRAY FLOW	> 1750 GPM 1750 gpm	1750 GPM is the value of CS flow assumed in the Containment Peak Pressure Analysis for the containment design basis accident. This value is the minimum acceptable value for a single train of CS. 1750 gpm CS + two containment Fan Coolers is acceptable.	To determine if containment spray meet the containment cooling requ	
01	CONTHT SPRAY FLOW	> 1750 GPM 1750 GPM	1750 GPM is the value of CS flow assumed in the Containment Peak Pressure Analysis for the containment design basis accident. This value is the minimum acceptable value for a single train of CS. 1750 gpm CS + two containment Fan Coolers is acceptable.	To verify that 50% of the require removal capability is being provi containment spray (> 1750 gpm).	
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CUMENT NO: 009-00592-146 AGE NO: 10 OF 13

SONGS 2/3 ISOP II PHASE II INSTRUMENT USE AND BASES TABLE

DATE: 04/28/93 REVISION: 01

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RP	PARAMETER	STEP VALUE/ ENG. LIMIT	BASES	USE
]				
01	CONTHT TEMP	< 120 deg F UL 120 deg F	120 deg F is based on engineering judgement as the max temp which will be observed without an energy release to the contmt. This value coincides with the contmt temp limit specified in T.S. 3.6.1.5 LCO,	To verify expected post-trip containment temperature conditions.
01	CONTHT TEHP	< 120 deg F UL 120 deg F	120 deg F is based on engineering judgement as the max temp which will be observed without an energy release to the contmt. This value coincides with the contmt temp limit specified in T.S. 3.6.1.5 LCO.	To determine if containment conditions indicate an event other than SGTR is in progress.
)1 	CONTHT TEMP	< 120 deg F UL 120 deg F	120 deg F is based on engineering judgement as the max temp which will be observed without an energy release to the contmt. This value coincides with the contmt temp limit specified in T.S. 3.6.1.5 LCO.	To verify containment temperature < 120 deg F and direct event re-diagnoses if it is not.
01	Contint tenp	< 120 deg F UL 120 deg F	120 deg F is based on engineering judgement as the max temp which will be observed without an energy release to the contmt. This value coincides with the contmt temp limit specified in T.S. 3.6.1.5 LCO.	To confirm that an event other than an LOFW is not taking place.
02 	сонтит тенр	< 215 deg F Limit Not Entered	Bases data not yet available.	To determine if event re-diagnosis is required during performance of the SBO procedure.
03	CONTINT TEMP	< 215 deg F Limit Not Entered	Bases data not yet available.	 To determine if CSAS has actuated or should have actuated.
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CUMENT NO: 009-0PS92-146 GE NO: 11 OF 13

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SONGS 2/3 ISOP II PHASE II INSTRUMENT USE AND BASES TABLE

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₹₽	PARAMETER	STEP VALUE/ Eng. Limit	BASES	USE
13	CONTMIT TEMP	< 215 deg F Limit Not Entered	Bases data not yet available.	To evaluate the need to initiate containment spray operation.
)3	CONTMT TEMP	> 215 deg F Limit Not Entered	Bases data not yet available.	To evaluate the effectiveness of the present success path for control of containment temperature and pressure.
)3 	CONTHT TEMP	STABLE OR LOWRNG None	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To evaluate the need to initiate containment spray operation.
13 	CONTINT TEMP	< 215 deg F Limit Not Entered	Bases data not yet available.	To verify that CCAS is the appropriate success path (via containment temp < 215 F and stable) or direct the operator to a different success path.
)3	CONTINT TEMP	STABLE OR LOWERIN NONE	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To verify that CCAS is the appropriate success path (via containment temp < 215 F and stable) or direct the operator to a different success path.
)3	CONTRIT TEMP	< 215 deg F Not yet available	Bases data not yet available.	 To determine if event re-diagnosis is required.
14	CONTINT TEMP	NOT RISING NONE	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To verify conditions inside containment to be normal.



CUMENT NO: 009-0PS92-146 GE NO: 12 OF 13

SONGS 2/3 ISOP II PHASE II INSTRUMENT USE AND BASES TABLE

DATE: 04/28/93 REVISION: 01

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Module #: 05

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:P	PARAMETER	STEP VALUE/ ENG. LIMIT	BASES	USE
15	CONTINT TEMP	< 145 deg F Limit Not Entered	Bases data not yet available.	To confirm that an event other than an LOFW is not taking place.
15	CONTINT TEMP	< 145 deg F Not yet available	Bases data not yet available.	To determine if event re-diagnosis is required.
35	CONTHIT TEMP	< 145 deg F Limit Not Entered	Bases data not yet available.	To determine if the success path in use (contaiment temperature < 145 F) is acceptable, or direct the operator to a different success path.
16	CONTHT TEMP	CONSTNT OR LOWRNG NONE	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To evaluate the effectiveness of the present success path for control of containment temperature and pressure.
ю	CONTINT TEMP	RISING NONE	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To evaluate the effectiveness of the present success path for control of containment temperature and pressure.
¥6	CONTINT TEMP	STABLE OR LOWRING None	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To evaluate the effectiveness of the present success path for control of containment temperature and pressure.



CUMENT NO: 009-0PS92-146 GE NO: 13 OF 13

SONGS 2/3 ISOP II PHASE II INSTRUMENT USE AND BASES TABLE

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DATE: 04/28/93 REVISION: 01

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Module #: 05

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P	PARAMETER	STEP VALUE/ ENG. LIMIT	BASES	USE
6	CONTHT TEMP	STABLE OR LOWERIN None	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To determine if containment temperature is stable or lowering in order to allow continued use of the present success path, or direct the operator to a different success path.
7	CONTHIT TEMP	CONSTNT OR LOWRNG None	There are no engineering limits for the trending or monitoring of parameters. Since no value is specified in the trend, no engineering limits apply.	To determine if containment pressure is less than the CIAS setpoint and determine the appropriate success path to be used.
7	Солтит темр	< 145 deg F Limit Not Entered	Bases data not yet available.	To verify expected post-trip containment temperature conditions.
8	CONTINT TEMP	CONSTANT OR LOWER N/A	Use of the Mini-Purge System to vent containment in the event that the CS system does not operate is no longer applicable to the EOIs. SCE has directed that ABB-CE need not address this issue in this study.	To determine if the containment purge success path is performing adequately by observing containment temperature constant or lowering.

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL

QAP 3.10 **REVISION 1** PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checidist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checidist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: 009-0P592-146 Rev. 01

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions,
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addends properly identified, and are their requirements for design met?
- Have applicable construction and operating experience been considered? 6
- 7. Have the design interface requirements been satisfied?
- 8. Was an appropriate design method used?

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- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required ap-
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed
- 15. Her adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?
- Has the design properly considered radiation exposure to the public and plant 16.

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EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL

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QAP 3.10 **REVISION 1** PAGE 5 OF 5

009-0P5 92-146 Nevol ÔK Are the acceptance criteria incorporated in the design documents sufficient to allow 17. verification that design requirements have been satisfactorily accomplished? 18. Have adequate pre-operational and subsequent periodic test requirements been ap-19. Are adequate handling, storage, cleaning and shipping requirements specified? 20. Are adequate identification requirements specified? 21. Has an appropriate the page been used? 22. Are all pages sequentially numbered and marked with a valid number? 23. Is the presentation legible and reproducible? Have all cross-outs or overstrikes in the documentation been initialed and dated by 24. 25. Are requirements for record preparation review, approval, retention, etc., adequately Christ HI N/A Comments/Remarks:

martin Sue 4/28/93

Independent Reviewer: Name/Signature/Date

File No: 009-OPS92-060 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 05 Group 01 Engineering Limit and Bases

PARAMETER: CONTAINMENT PRESSURE

PREPARED BY:

| rev. 01

VERIFICATION STATUS: COMPLETE The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists N_{o} of QAM-101. MARTIN GREER mai Name Signature Date Independent Reviewer

APPROVED BY:

10 Cognizan ineer Manager (Print Name) Cognizant Engineering Manager (Signature)

File No: 009-0PS92-060 Revision: 01 Page: 2 of 3

SONGS 263 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 01

Parameter: CONTAIMMENT PRESSURE

Step Value(s): Use(s):

< 1.5 PSIG To verify expected post-trip containment pressure conditions.

< 1.5 PSIG To confirm that an event other than a LOFW is not taking place.

< 1.5 PSIG To verify Containment Pressure < 1.5 PSIG and direct event re-diagnosis if it is not.

Engineering Limit(s):

Upper Limit: 1.5 PSIG

Bases for Engineering Limit(s):

This value was selected to verify that containment pressure remains below the upper limit for normal containment pressure. In <u>Standard Post Trip Actions</u>, containment cooling and circulation are initiated if necessary, and CIAS and CCAS are actuated or verified actuated. In <u>Loss of Forced</u> <u>Circulation/Loss of Offsite Power</u>, and <u>Loss of Feedwater</u>, an energy release to containment is not expected, so a re-diagnosis of the plant conditions is directed, and this procedure is exited in favor of the proper event-based procedure, or the functional recovery procedure.

1.5 PSIG coincides with the upper limit for Technical Specification 3.6.1.4, Limiting Condition for Operation on

File No: 009-0PS92-060 Revision: 01 Page: 3 of 3

Containment Pressure (Ref 1 and 2), which, along with control room annunciation, defines normal operating containment pressure. The basis for the LCO is that 1.5 PSIG, combined with the maximum pressure generated by a Steam Line Break in containment, 55.7 PSIG, coincident with a loss of a train of containment cooling, will limit total pressure to 57.2 PSIG, which is less than the design pressure and consistent with the accident analyses (Ref 3).

Assumptions:

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1. In accordance with NES&L Quality Procedure S023-XXIV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1,2,3

References:

- 1. San Onofre Technical Specifications, Unit 2 Amendment 94, Limiting Condition For Operation 3.6.1.4 and its Bases.
- 2. San Onofre Technical Specifications, Unit 3 Amendment 84, Limiting Condition For Operation 3.6.1.4 and its Bases.
- 3. <u>San Onofre 2 & 3 Updated FSAR</u>, Section 6.2.1.1.1.1, and Table 6.2-2, Rev 8.



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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Da	current Title/Number/Revision: 009-0P592-60		
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		ОК	. N/A
۲.	Were the inputs correctly selected and incorporated into the design?		<u> </u>
2	is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?	V	
3.	Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed?		
4.	Are the appropriate quality and quality assurance requirements specified?	~	
6 .	Are the applicable codes, standards and regulatory requirements including issue and addenda properly identified, and are their requirements for design met?		1
6.	Have applicable construction and operating experience been considered?		1
7.	Have the design interface requirements been satisfied?		
8	Was an appropriate design method used?		
8.	Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?		
10.	is the output (results and conclusions) reasonable compared to inputs?		4
11.	Are the specified parts, equipment, and processes suitable for the required application?		1
12	Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?		
13.	Have adequate maintenance features and requirements been specified?		1
14.	Are accessibility and other design provisions adequate for performance of needed		\checkmark
15.	Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?		
16.	Has the design properly considered radiation exposure to the public and plant personnel?		

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL

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009-0P5 92-60

- Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?
- Have adequate pre-operational and subsequent periodic test requirements been ap-18. propriately specified?
- 19. Are adequate handling, storage, cleaning and shipping requirements specified?
- 20. Are adequate identification requirements specified?
- Has an appropriate the page been used? 21.

Are all pages sequentially numbered and marked with a valid number?

- is the presentation legible and reproducible? 23.
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by
- Are requirements for record preparation review, approval, retention, etc., adequately 25.

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Comments/Remarks:

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File No: 009-0PS92-071 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT: Southern California Edison PLANT: San Onofre 2&3 PROJECT: ISOPS II Support C-E JOB NUMBER: 2001216

DOCUMENT: Module 05 Group 02 Engineering Limit and Bases PARAMETER: Containment Pressure

PREPARED BY:

John M. Flaherty | rev. 01 Cognizant Enginéer (Print Name) Date: 4/27/93 Cognizant Engineer (Signature)

VERIFICATION STATUS: COMPLETE The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists N_2 of QAM-101. TATTIN GREER Name Signature Date

Independent Reviewer

APPROVED BY:

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Cognizant Engineering Manager (Print Name)

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Cognizant Engineering Manager (Signature)

File No: 009-OPS92-071 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 02

Parameter:

Step Value(s): Use(s):

> 14 PSIG To verify CSAS actuation.

Containment Pressure

< 14 PSIG To determine if CSAS has actuated or should have actuated.

> 14 PSIG To determine if CSAS has actuated or should have actuated.

<14 PSIG AND To verify Containment Pressure < 14 PSIG and not increasing and re-diagnose the event if it is not.

< 14 PSIG To evaluate the need to initiate containment spray operation.

STABLE OR To evaluate the need to initiate containment LOWERING spray operation.

< 14 PSIG To determine if event re-diagnosis is required.

CONSTANT OR To determine if containment pressure is constant LOWERING or lowering and if it is not, to direct use of another success path.

File No: 009-0PS92-071 Revision: 01 Page: 3 of 3

Engineering Limit(s):

Upper Limit: 14 PSIG

Bases for Engineering Limit(s):

14 PSIG is based on the Engineered Safety Features Actuation System (ESFAS) trip value for the Containment Spray Actuation Signal (Ref 2 & 3). FSAR Table 7.3-3 (Ref 4) shows that the trip value was established based on the 20 PSIG setpoint used in the safety analysis, with a 6 PSI channel accuracy factor.

Proper actuation or manual intervention is required to provide the containment pressure and temperature reduction assumed available in the facility design for the protection and mitigation of accident and transient conditions (Ref 1).

Assumptions:

1. In accordance with NES&L Quality Procedure SO23-XXIV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1,2,3,4

References:

- <u>San Onofre 2 & 3 Updated FSAR</u>, Section 6.2.2.1.1, Containment Spray System Design Bases, Rev 8.
- San Onofre Technical Specifications, Unit 2 Amendment 94, Limiting Condition For Operation 3.6.1.4 and its Bases.
- 3. San Onofre Technical Specifications, Unit 3 Amendment 84, Limiting Condition For Operation 3.6.1.4 and its Bases.
- San Onofre 2 & 3 Updated FSAR, Table 7.3-3, Engineered Safety Features Actuation Systems Summary (Sheet 1), Rev 8.

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL SEA STONM BOYON QAM-101

QAP 3.10 **REVISION 1** PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: ____ 009-0P592-7/

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions,
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- Are the applicable codes, standards and regulatory requirements including issue and 5. addence properly identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- 7. Have the design interface requirements been satisfied?
- Was an appropriate design method used? 8
- 2. Have the adjustment factors, uncertainties, and empirical correlations been correctly
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required ap-
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed
- 15. Hes adequate accessibility been provided to perform the in-service inspection expected to be required during the plant IIIe?
- 16. Has the design properly considered radiation exposure to the public and plant

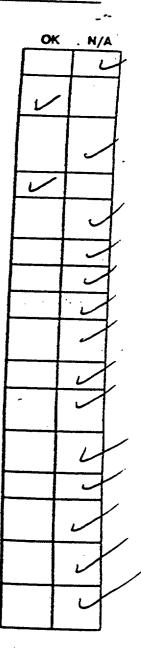


EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL AREA BROWN BOVEN

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QAP 3.10 REVISION 1 PAGE 5 OF 5

009-0P5 92-71

- Are the acceptance criteria incorporated in the design documents sufficient to allow 17. verification that design requirements have been satisfactorily accomplished?
- 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified?
- Are adequate handling, storage, cleaning and shipping requirements specified? 19.
- Are adequate identification requirements specified? 20.
- Has an appropriate the page been used? 21.
- Are all pages sequentially numbered and marked with a valid number? 22
- is the presentation legible and reproducible? 21.
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
- 25. Are requirements for record preparation review, approval, retention, etc., adequately

Comments/Remarks:

MARTIN G marte 4/18/93 independent Reviewer. Name/Signature/Date

EXHIBIT 3.10-1

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File No: 009-OPS92-063 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 05 Group 03 Engineering Limit and Bases **PARAMETER:** Containment Pressure

PREPARED BY:

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John M. Flaherty | rev. 01 Cognizant Engineer (Print Name) Date: 1/27/97 Engineer (Signature)

VERIFICATION STATUS: COMPLETEThe Safety-Related design information contained in thisdocument has been verified to be correct by means ofDesign Review using Checklists N_0 7 of OAM-101.MARTIN GRANMart Men.HARTINGRAN

Name Signature Date Date

APPROVED BY:

Cognizant Engineer Manager (Print Name) 11a Cognizant Angineering Manager (Signature)

File No: 009-OPS92-063 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05	Group: 03
Parameter:	Containment Pressure
Step Value(s):	Use(s):
> 3.4 PSIG	To verify CIAS actuation if containment pressure is >3.4 PSIG.
> 3.4 PSIG	To verify CCAS actuation if containment pressure is >3.4 PSIG.
< 3.4 PSIG	To determine if containment pressure < CIAS setpoint or verify CIAS actuation if > than setpoint.
< 3.4 PSIG	To determine if containment pressure < SIAS setpoint or verify SIAS actuation if > setpoint.
< 3.4 PSIG	To verify CIAS actuation if containment pressure is >3.4 PSIG.
> 3.4 PSIG	To determine if containment pressure < CIAS setpoint or verify CIAS actuation if > setpoint.
< 3.4 PSIG	To determine if containment pressure is less than the CIAS setpoint and determine the appropriate success path to be used.
> 3.4 PSIG	To evaluate the need for manual containment isolation.
< 3.4 PSIG	To evaluate the need for containment isolation.

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File No:009-OPS92-063Revision:01Page:3 of 3

Engineering Limit(s):

Upper Limit: 3.4 PSIG

Bases for Engineering Limit(s):

Containment pressure is observed by the Operator to verify the proper actuation of Containment Isolation (CIAS) and Emergency Containment Cooling (CCAS) if above 3.4 PSIG, and that CIAS and CCAS have not actuated and are not needed if below 3.4 PSIG.

The proper operation of this actuation or manual intervention is required to provide the containment capability assumed available in the facility design for the protection and mitigation of accident and transient conditions. The engineering limit is therefore determined to be coincident with the ESFAS trip value.

Assumptions:

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1. In accordance with NES&L Quality Procedure SO23-XXIV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1,2

References:

- 1. San Onofre Technical Specifications, Unit 2 Amendment 94, Limiting Condition For Operation 3.6.1.4 and its Bases.
- 2. San Onofre Technical Specifications, Unit 3 Amendment 84, Limiting Condition For Operation 3.6.1.4 and its Bases.

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL NOVEN QAM-101

QAP 3.10 **REVISION 1** PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

expected to be required during the plant #a?		Document Title/Number/Revision: 009-0P592-063	•
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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL

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QAP 3.10 REVISION 1 PAGE 5 OF 5

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- Are the acceptance criteria incorporated in the design documents sufficient to allow 17. verification that design requirements have been satisfactorily accomplished?
- 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified?
- Are adequate handling, storage, cleaning and shipping requirements specified? 19.
- Are adequate identification requirements specified? 20.
- Has an appropriate the page been used? 21.
- Are all pages sequentially numbered and marked with a valid number? 22
- is the presentation legible and reproducible? 23
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
- 25. Are requirements for record preparation review, approval, retention. etc., adequately

Comments/Remarks:

ARTIN GRAF At. Sie 4/28/93 Independent Reviewer: Name/Signature/Date

File No: 009-OPS92-072 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

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CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 05 Group 04 Engineering Limit and Bases PARAMETER: Containment Pressure

| rev. 01 PREPARED BY: John M. Flaherty Cognizant Engineér, (Print Name) Date: " Engineer (Signature) Cognizant VERIFICATION STATUS: COMPLETE The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $\frac{N_0}{2}\frac{9}{2}$ of QAM-101. CRAFER Signature Name Independent Reviewer 1.1 APPROVED BY: Cognizant (Print Name) Manager Cognizant Angineering Manager (Signature) Da

File No: 009-OPS92-072 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 04

Parameter: Containment Pressure

Step Value(s): Use(s):

< 14 PSIG

To evaluate containment spray termination.

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Engineering Limit(s):

Upper Limit: 15 PSIG

Bases for Engineering Limit(s):

With containment spray isolated and containment pressure ≤ 25 ° of design (15 PSIG), the remaining containment heat removal systems (i.e., fan coolers) are capable of maintaining and further reducing containment pressure. Therefore, the containment spray system may be secured, and the Containment Spray Actuation Signal (CSAS) reset (Ref 1).

The engineering limit is based on the technical specification ALLOWABLE VALUE for CSAS (Ref 2). However, since the technical specification TRIP VALUE for CSAS is 14 PSIG, the value which is used in the Emergency Operating Instructions will have to allow for the fact that the reset of the CSAS trip signal cannot occur until the Engineered Safeguards Features Actuation System (ESFAS) "sees" containment pressure is less than the ESFAS trip setpoint.

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File No: 009-OPS92-072 Revision: 01 Page: 3 of 3

Assumptions:

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In accordance with NES&L Quality Procedure S023-XXIV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1,2

References:

- 1. San Onofre 2&3 FSAR, Updated, Rev. 8, Section 6 (Engineered Safety Features).
- 2. San Onofre Technical Specifications, Unit 2 Amendment 94, and Unit 3 Amendment 84, Limiting Condition For Operation 3.6.1.4 and its Bases.

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QAP 3.10 **REVISION 1** PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

<i>.</i> .	Document Title/Number/Revision: 009-0P592-072	
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13.	conditions to which the material will be exposed?	
14.	Here adequate maintenance features and requirements been specified?	
	Are accessibility and other design provisions adequate for performance of needed	
15.	Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant time?	
16.	Has the design properly considered radiation exposure to the public and plant	

EXHIBIT 3.10-1

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File No: 009-0PS92-064 Revision: 0 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 05 Group 05 Engineering Limit and Bases

PARAMETER: Containment Pressure

PREPARED BY: <u>Will B. Dawes</u> Cognizant Engineer (Print Name) Will B. Dawes Date: 10-14-92

Cognizant Engineer (Signature)

.

VERIFICATION STATUS: COMPLETE The Safety-Related design information contained in this

document has been verified to be correct by means of Design Review using Checklists <u>9</u> of QAM-101.

Kenneth E. Fullene	Kennetti E, Faillener	10/10/42
Name	Signature	Date
Independent Reviewe		• ·

APPROVED BY:

JOSEPH A. LOND

Cognizant Engineering Manager (Print Name)

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Zant Engineering Manager (Signature)

File No: 009-OPS92-064 Revision: 0 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 05

Parameter: Containment Pressure

Step Value(s): Use(s):

INCREASING To identify the type of event and location when Pressurizer Pressure is rapidly decreasing, using the "Break Identification Chart".

Engineering Limit(s):

None.

Bases for Engineering Limit(s):

There are no associated engineering limits for the trending of parameters. Since no value is specified in the trend, no value will be assigned to the engineering limit. Usually, when an operator is instructed to trend an indication, the indication is used in conjunction with other parameters to corroborate the condition of a safety function. An operator is not required to perform a safety related action on the trending of a single parameter by itself in the EOIs. Where the trending of a parameter, the values given for the operating limits on that evaluated for their engineering limits.

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Assumptions:

None.

References:

None.

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL DAM-101

QAP 3.10 REVISION 1 PAGE 4 OF 5

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. N/A

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Tile/Number/Revision: Mod. 5 Group 5, Containment Pressure/ 009-08592-064/Rev. 00.

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda properly identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- 7. Have the design interface requirements been satisfied?
- 8. Was an appropriate design method used?

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- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?
- 10. is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required application?
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair?
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?
- 16. Has the design properly considered radiation exposure to the public and plant personnel?

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EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

QAP 3.10 REVISION 1 PAGE 5 OF 5

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- 17. Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?
- 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified?
- 19. Are adequate handling, storage, cleaning and shipping requirements specified?
- 20. Are adequate identification requirements specified?
- 21. Has an appropriate title page been used?
- 22. Are all pages sequentially numbered and marked with a valid number?
- 23. is the presentation legible and reproducible?
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
- 25. Are requirements for record preparation review, approval, retention. etc., adequately specified?

Comments/Remarks: ______

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Kenneth E, Faulknor/Kennethi E. Faulkener / 10/16/92

Independent Reviewer: Name/Signature/Date

EXHIBIT 3.10-1

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File No: 009-OPS92-065 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 05 Group 06 Engineering Limit and Bases **PARAMETER:** Containment Pressure

PREPARED BY:

John M. Flaherty Cognizant Engineer (Print Name) | rev. 01 UNI. Date: 7 Cognizant Engineer (Signature) VERIFICATION STATUS: COMPLETE The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists 1/2 9 of QAM-101. MARTIN GREER Name Signature Date

Independent Reviewer

APPROVED BY:

Cognj zant Engineering Manager (Print Name) Cognizant Engineering Magager (Signature) Date

File No: 009-OPS92-065 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 06

Parameter: Containment Pressure

Step Value(s): Use(s):

< 1.5 PSIG

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To determine if containment conditions indicate an event other than SGTR is in progress.

Engineering Limit(s):

Upper Limit: 1.5 PSIG

Bases for Engineering Limit(s):

This value was selected to verify that containment pressure remains below the upper limit for normal containment pressure. With a diagnosed Steam Generator Tube Rupture, an energy release to containment is not expected. If an energy release is indicated, a re-diagnosis of the plant conditions is directed, and this procedure is exited in favor of the proper event-based procedure, or the functional recovery procedure.

1.5 PSIG is based on engineering judgement as the maximum pressure which will be observed without an energy release to the containment. This pressure coincides with the upper limit for Technical Specification 3.6.1.4, Limiting Condition for Operation (LCO) on Containment Pressure (Ref 1 and 2). This limit defines the upper limit for normal containment pressure. The basis for the LCO is that 1.5 PSIG, combined with the maximum pressure generated by a Steam Line Break in containment, 55.7 PSIG, will limit total pressure to 57.2 PSIG. This is less than the design pressure of 60 PSIG and consistent with the accident analyses (Ref 3).

File No: 009-0PS92-065 Revision: 01 Page: 3 of 3

Assumptions:

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1. In accordance with NES&L Quality Procedure SO23-XXIV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1,2,3

References:

- 1. San Onofre Technical Specifications, Unit 2 Amendment 94 Limiting Condition For Operation 3.6.1.4 and its Bases.
- 2. San Onofre Technical Specifications, Unit 3 Amendment 84 Limiting Condition For Operation 3.6.1.4 and its Bases.
- 3. <u>San Onofre 2 & 3 Updated FSAR</u>, Section 6.2.1.1.1.1, and Table 6.2-2, Rev 8.

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL **OAM-101** .

QAP 3.10 **REVISION 1** PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checidist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checidist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

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- 1. Were the inputs correctly selected and incorporated into the design? 2. is the material presented sufficiently detailed as to purpose, method, assumptions,
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed?
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- 7. Have the design interface requirements been satisfied?
- 8. Was an appropriate design method used?

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- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required ap-
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Here adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant He?
- 16. Has the design properly considered radiation exposure to the public and plant

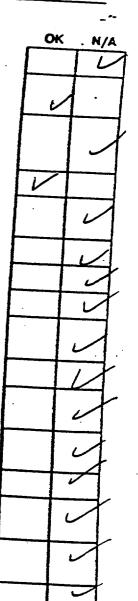


EXHIBIT 3.10-1

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QUALITY ASSURANCE PROCEDURES MANUAL **QAM-101**

QAP 3.10 REVISION 1 len PAGE S OF S

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Are the acceptance criteria incorporated in the design documents sufficient to allow 17. verification that design requirements have been satisfactorily accomplished?

- 18. Have adequate pre-operational and subsequent periodic test requirements been ap-
- 19. Are adequate handling, storage, cleaning and shipping requirements specified?
- 20. Are adequate identification requirements specified?
- 21. Has an appropriate the page been used?
- Are all pages sequentially numbered and marked with a valid number?
- is the presentation legible and reproducible? 23
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by
- 25. Are requirements for record preparation review, approval, retention, etc., adequately

Comments/Remarks:

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MATTIN GR marker Sun 2/ 93 Independent Reviewer: Name/Signature/Date

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File No: 009-0PS92-073 Revision: 01 1 of 3 Page:

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

San Onofre 2&3 Southern California Edison PLANT: CLIENT: C-E JOB NUMBER: 2001216 ISOPS II Support PROJECT:

DOCUMENT: Module 05 Group 07 Engineering Limit and Bases

Containment Pressure PARAMETER:

PREPARED BY:	John M. Flaherty Cognizant Engineer (Print Name) (MAN MUMJAA) Cognizant Engineer (Signature)	rev. 01 Date: 4/27/93
The Safet document	<u>TION STATUS: COMPLETE</u> ty-Related design information contains has been verified to be correct eview using Checklists <u>No 9</u> of Q7	by means of

Name Independent Reviewer

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Cognizant

APPROVED BY:

MARTIN GRE

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Manager (Print Name) Cognizant

Date (Signature) ineering Manager

28/93

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File No: 009-OPS92-073 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 07

Parameter: Containment Pressure

Step Value(s): Use(s):

< CCW Pressure To compare containment pressure with CCW pressure prior to, or after restoring CCW to the containment.

Engineering Limit(s):

None.

Bases for Engineering Limit(s):

There are no associated engineering limits for the comparison of parameters. Since no value is specified in the comparison, no value will be assigned to the engineering limit.

After a Containment Isolation Actuation Signal (CIAS) isolates the non-critical loop of Component Cooling Water (CCW), the RCPs must be secured (Ref 1). When conditions are suitable, CCW is returned to service and RCPs are started, because forced circulation is a more effecient means of core and Reactor Coolant System heat removal than is natural circulation.

One of the suitability checks is that containment pressure be less than CCW pressure, thus demonstrating that leakage across a CCW line break would be into the containment, not into the CCW system. Leakage into the CCW system constitutes a potential radiological release path (Ref 2).

File No: 009-OPS92-073 Revision: 01 Page: 3 of 3

Assumptions:

| rev. 01

1. In accordance with NES&L Quality Procedure S023-XXIV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1

| rev. 01

2. In accordance with NES&L Quality Procedure S023-XXIV-7-15, documents that are not Primary or Secondary Design documents may be used as reference documents if justification is provided. The references noted below are formal engineering correspondence between the design principals (e.g., NSSS vendor architect, etc,) and SCE. Their use as reference material is justified when the basis for the engineering limit is "operational experience" or "engineering judgement", and no Primary or Secondary Design Document exists.

Ref: 2

References:

1. San Onofre 2 & 3 Updated FSAR, Section 9.2.2.2.3.4, Rev 8.

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2. <u>Operating Instruction SO23-14-5</u>, <u>Bases and Deviation</u> <u>Document</u>, Rev. 3.

VER QAP 3.10 REVISION I PAGE 4 OF 5	ke used, and if applicable. Lev. 01	× ×	5		7			₹ 	<u>}</u>						2 2	-
ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101 CHECKLIST NO. 9 REVIEW OF OTHER DESIGN INCLIMENTE	3) shall be considered whenever this checkler to be $0.05 - 0.75$ 92 - 0.73	the inputs correctly selected and incorporated into the design? material presented sufficiently detailed as to purpose mained	 Astumptions necessary to perform the design activity adecustery functions. 	ications when the detailed design activities are completed?	Are the applicable codes, standards and regulatory requirements specified? Modenda property identified and and regulatory requirements including lesue and	Here applicable construction and operating experience been construction	e design interface requirements been satisfied?	 adjustment factors, uncertainties, and empirical correlations been corrective 	is the output (results and conclusions) reasonable compared to incred	specified perts, equipment, and processes suitable for the required ap-	Are the specified materials compatible with each other and the design environmental conditions to which the material will be emmanded	quete maintenance features and requirements hean anothers	sublity and other design provisions adequate for performance of needed	parts accessibility been provided to perform the in-service impection to be required during the relax way	Has the design property considered radiation exposure to the public and plant personne?	•
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EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL

ASEA BROWN BOVEN QAM-101

QAP 3.10 **REVISION 1** PAGE 5 OF 5

- Are the acceptance criteris incorporated in the design documents sufficient to allow 17. verification that design requirements have been antisfactorily accomplished?
- 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified?
- 19. Are adequate handling, storage, cleaning and shipping requirements specified?
- 20. Are adequate identification requirements specified?
- 21. Has an appropriate the page been used?
- Are all pages sequentially numbered and marked with a valid number?
- is the presentation legible and reproducible? 23.
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by
- 25. Are requirements for record preparation review, approval, retention, etc., adequately

OK NIA

Comments/Remarks:

22.

MARTIN GRA 93 Independent Reviewer: Name/Signature/Date

EXHIBIT 3.10-1

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File No: 009-0PS92-115 Revision: 00 1 of 2 Page:

Date

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

San Onofre 2&3 Southern California Edison PLANT: CLIENT: C-E JOB NUMBER: 2001216 PROJECT: ISOPS II Support

Engineering Limit and Bases Group 08 DOCUMENT: Module 05

Containment Pressure PARAMETER:

PREPARED BY:

John M. Flaherty Cognizant Engineer ,(Print Name) Date: 4/12/197 Cognizant Engineer (Signature)

VERIFICATION STATUS: COMPLETE The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists No 9 of QAM-101.

MARTIN GREER Signature

Independent Reviewer

APPROVED BY:

Name

53 ing Manager (Print Name) Cognizant Engl

ineering Manager (Signature) Cognizan

File No: 009-OPS92-115 Revision: 00 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05 Group: 08

Parameter: Containment Pressure

Step Value(s): Use(s):

< 3.4 PSIG	To confirm that an event other than an LOFW is not taking place.
< 3.4 PSIG	To determine if event re-diagnosis is required.

Engineering Limit(s):

None

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Bases for Engineering Limit(s):

No applicable basis/reference was found (See Ref. 1).

Assumptions:

None

References:

1. EMail Message, "Boiler Plate for References," Paul Curry (SCE) to Bill Watson (ABB C-E), 3/1/93.

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the Independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: 009-0P592-115 ОК N/A 1. Were the inputs correctly selected and incorporated into the design? 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units? $\boldsymbol{\nu}$ 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed? 4. Are the appropriate quality and quality assurance requirements specified? 5. Are the applicable codes, standards and regulatory requirements including issue and addends properly identified, and are their requirements for design met? Have applicable construction and operating experience been considered? 6 7. Have the design interface requirements been satisfied? Was an appropriate design method used? 8 Have the adjustment factors, uncertainties, and empirical correlations been correctly 2 is the output (results and conclusions) reasonable compared to inputs? 10. 11. Are the specified parts, equipment, and processes suitable for the required ap-Are the specified materials compatible with each other and the design environmental 12. conditions to which the material will be exposed? 13. Have adequate maintenance features and requirements been specified? 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair? . 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant He? 16. Has the design properly considered radiation exposure to the public and plant personnel?

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

QAP 3.10 REVISION 1 PAGE 5 OF 5

- 17. Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?
- 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified?
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- .20. Are adequate identification requirements specified?
- 21. Has an appropriate the page been used?
- 22. Are all pages sequentially numbered and marked with a valid number?
- 23. Is the presentation legible and reproducible?
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
- 25. Are requirements for record preparation review, approval, retention. etc., adequately specified?

Comments/Remarks:

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marter Gree 4/28/93

Independent Reviewer: Name/Signature/Date

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File No: 009-0PS92-061 Revision: 00 1 of 2 Page:

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT: Southern California Edison PLANT: San Onofre 2&3 C-E JOB NUMBER: 2001216 **PROJECT:** ISOPS II Support

DOCUMENT: Module 05 Group 09 Engineering Limit and Bases PARAMETER: Containment Pressure

PREPARED BY:

Will B. Dawes Cognizant Engineer (Print Name)

Cognizant Engineer (Signature)

Date: 10-12-92

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists _____ of QAM-101.

Kenneth E. Faulknor

Kennette E Faulten Signature

Date

Name Independent Reviewer

APPROVED BY:

<u>Josefh 1 Congo</u> Cognizant Engineering Manager (Print Name)

10/15/92-Dete

eognizant Engineering Manager (Signature)

File No: 009-0PS92-061 Revision: 00 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 09

Parameter: Containment Pressure

Step Value(s): Use(s):

NOT RISING To verify conditions inside containment are normal.

Engineering Limit(s):

None.

Bases for Engineering Limit(s):

There are no associated engineering limits for the trending of parameters. Since no value is specified in the trend, no value will be assigned to the engineering limit. Usually, when an operator is instructed to trend an indication, the indication is used in conjunction with other parameters to corroborate the condition of a safety function. An operator is not required to perform a safety related action on the trending of a single parameter by itself in the EOIs. Where the trending of a parameter, the values given for the operating limits on that evaluated for their engineering limits.

Assumptions:

None.

References:

None.

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Tile/Number/Revision: Mod 5 Group 9 Containment Pressure/ 009-0PS 92-061 / Rev. 00

- 1. Were the inputs correctly selected and incorporated into the design?
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- 8. Was an appropriate design method used?

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- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?
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- 16. Has the design properly considered radiation exposure to the public and plant personnel?

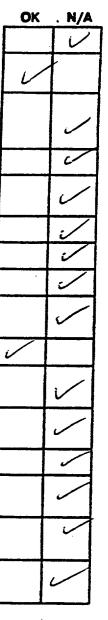


EXHIBIT 3.10-1

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL EA BOOWN BOVERI QAM-101

QAP 3.10 **REVISION 1** PAGE 5 OF 5

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- 17. Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?
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- Are all pages sequentially numbered and marked with a valid number? 22.
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- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
- 25. Are requirements for record preparation review, approval, retention. etc., adequately **Specified**?

Nonp Comments/Remarks:

Kenneth E. Faulkner / Kenneth E. Faultener / 10/11/82

Independent Reviewer: Name/Signature/Date

13

File No: 009-0PS92-085 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 05 Group 11 Engineering Limit and Bases **PARAMETER:** Containment Pressure

PREPARED BY:

John M. Flaherty Cognizant Engineer (Print Name) Cognizant Engineer (Signature)

Date: 4

<u>VERIFICATION STATUS: COMPLETE</u> The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists <u>299</u> of QAM-101.

MARTIN GREER Name Signature Date

Independent Reviewer

APPROVED BY:

11

Cognizant Engineering Manager (Print Name)

Cognizant Engineering Manager (Signature)

File No: 009-OPS92-085 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 11

Parameter: Containment Pressure

Step Value(s): Use(s):

< 14 PSIG

To indicate if containment spray (and/or emergency fans) should be operating based on containment pressure.

Engineering Limit(s):

Upper Limit: 14 PSIG

Bases for Engineering Limit(s):

14 PSIG is determined to be the upper engineering limit for the containment pressure parameter for this use because it coincides with the Engineered Safety Features Actuation System (ESFAS) trip value (Ref 1 & 2). 14 PSIG is sufficiently high to prevent inadvertent actuation of the Containment Spray System (CSS), but low enough to minimize starting delay time. This parameter is used as acceptance criterion for the Containment Temperature and Pressure (CTP) safety function status check following an energy release to containment that raises containment pressure above 3.4 PSIG. If pressure is greater than 14 PSIG, any of the following three equipment configurations is verified to assure satisfaction of the CTP safety function (Ref 3):

1. Two train operation of Containment Emergency Fan Coolers and Dome Air Circulators with containment temperature and pressure stable or lowering.

File No: 009-0PS92-085 Revision: 01 Page: 3 of 3

2. Two train operation of Containment Spray with containment temperature and pressure stable or lowering.

3. One train of Containment Spray and one train of Emergency Fan Coolers operating with containment temperature and pressure stable or lowering.

The Containment Spray system consists of two redundant trains that together provide 100% of the required heat removal capability following the containment design basis accident. The Emergency Fan Coolers are also redundant trains that together provide 100% capability (Ref 3).

The Containment Cooling Actuation Signal (CCAS) that starts the Fan Coolers and the Containment Spray pumps is generated by the (ESFAS) when containment pressure reaches 3.4 PSIG. Containment Spray valves are opened when ESFAS generates a Containment Spray Actuation Signal (CSAS) when containment pressure reaches 14 PSIG. Since one train of spray may be required to satisfy the safety function, the engineering limit is determined to be the trip value of CSAS (Ref 2).

Assumptions:

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1. In accordance with NES&L Quality Procedure S023-XXIV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1,2,3

References:

- 1. San Onofre Technical Specifications, Unit 2 Amendment 94, Limiting Condition For Operation 3.6.1.4 and its Bases.
- 2. San Onofre Technical Specifications, Unit 3 Amendment 84, Limiting Condition For Operation 3.6.1.4 and its Bases.
- 3. San Onofre 2 & 3 Updated FSAR, Section 6.2, Containment Systems.

QUALITY ASSURANCE PROCEDURES MANUAL ABB COMBUSTION ENGINEERING NUCLEAR POWER QAM-101

PAGE 4 OF 5 **REVISION 1** QAP 3.10

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

the independent Reviewer shall include it in the ruview Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable,

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- Were the inputs contectly selected and incorporated into the design?
- N is the material presented sufficiently detailed as to purpose, method, assumptions, manances, and unit??
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- Are the appropriate quality and quality assurance requirements specified?
- addenda property Identified, and are their requirements for design mat? Are the applicable codes, standards and regulatory requirements including lasue and
- Have applicable construction and operating experience been considered?
- Have the design interface requirements been satisfied?
- æ Was an appropriate design method used?
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- Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?
- õ is the output (results and conclusions) reasonable compared to inputs;
- plication? Are the specified parts, equipment, and processes suitable for the required ap-
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- conditions to which the material will be exposed? Are the specified materials compatible with each other and the design environmental
- ដ Have adequate maintenance features and requirements been specified?
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- Ģ Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant He?
- **16** Has the design properly considered radiation exposure to the public and plant berrouners

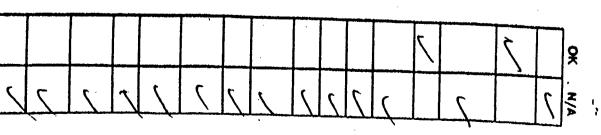


EXHIBIT 3.10-1

ABL COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL

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QAP 3.10 **REVISION 1** PAGE 5 OF 5

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009-0p592-085 0K Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished? 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified? 19. Are adequate handling, storage, cleaning and shipping requirements specified? Are adequate identification requirements specified? Has an appropriate the page been used? Are all pages sequentially numbered and marked with a valid number? is the presentation legible and reproducible? 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change? Are requirements for record preparation review, approval, retention. etc., adequately

Comments/Remarks:

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File No: 009-OPS92-074 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 05 Group 12 Engineering Limit and Bases PARAMETER: Containment Pressure

PREPARED BY:

Date: 4

<u>VERIFICATION STATUS: COMPLETE</u> The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $_{N_0}$ of OAM-101.

ARTIN GRAER Name

Independent Reviewer

Signature Date

APPROVED BY:

ONG don Cogni Manager (Print Name) Pognizant Engineering Manager (Signature)

File No: 009-OPS92-074 Revision: 01 Page: 2 of 3

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 12

Parameter: Containment Pressure

Step Value(s): Use(s):

< 3.4 PSIG To verify expected post-trip containment pressure conditions.

Engineering Limit(s):

Upper Limit: 3.4 PSIG

Bases for Engineering Limit(s):

The step value is used to ensure that Safety Function Status Check acceptance criteria for Containment Isolation and Containment Temperature and Pressure Control are met, either through a success path that verifies containment pressure below the step value, or if above, through success paths that verify that Engineered Safety Features (ESFAS) components have been automatically or manually placed in service (Ref 1).

The proper operation of ESFAS or manual operation of ESFAS components is required to provide the containment capability assumed available in the facility design for the protection and mitigation of accident and transient conditions. The engineering limit is therefore determined to be coincident with the ESFAS trip value (Ref 2 & 3).

File No: 009-OPS92-074 Revision: 01 Page: 3 of 3

Assumptions:

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1. In accordance with NES&L Quality Procedure S023-XXIV-7-15, documents that are not Primary or Secondary Design documents may be used as reference documents if justification is provided. The references noted below are formal engineering correspondence between the design principals (e.g., NSSS vendor architect, etc.) and SCE. Their use as reference material is justified when the basis for the engineering limit is "operational experience" or "engineering judgement", and no Primary or Secondary Design Document exists.

Ref: 1

2. In accordance with NES&L Quality Procedure SO23-XXIV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 2,3

References:

- 1. Emergency Operating Instruction SO-23-12-9, <u>Functional</u> <u>Recovery, Bases and Deviation Documents</u>, Rev. 3.
- 2. San Onofre Technical Specifications, Unit 2 Amendment 94, Limiting Condition For Operation 3.6.1.4 and its Bases.
- 3. San Onofre Technical Specifications, Unit 3 Amendment 84, Limiting Condition For Operation 3.6.1.4 and its Bases.

USTION ENGINEERING N SSURANCE PROCEDURES CHECKLIST NO. 9 REVIEW OF OTHER DESIGN DO	the considered where a little considered where a little considered where a little considered where a little constraint of the constraint o	incorporated into the d	ed as to purpose, m	the design activity . Attumptions (dent vities are commister	ance requirements	Astory requirement	iperience been oo	etisfied?	empirical correla	ble compared to	nses suitable for th	ch other and the d of?	dements been ep	dequete for perfor	erform the in-servi	
		1. Were the inputs correctly selected and	 Is the material presented sufficiently detail references, and units? 	 Are the assumptions necessary to perform : and reasonable? Where necessary, are the revertications when the detailed design acti- 	 Are the appropriate quality and quality assure 		 Here applicable construction and operating a 	4			··· •		Here adequate maintenance features and req	Are accessibility and other design provisions a maintenance and repair?	Her adequate accessibility been provided to p expected to be required during the many sets	Has the design properly considered radiation amount of a

EXHIBIT 3.10-1

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL

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QAP 3.10 REVISION 1 PAGE 5 OF 5

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- 17. Are the acceptance oriteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?
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- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
- 25. Are requirements for record preparation review, approval, retention. etc., adequately specified?

Comments/Remarks:

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Lien 4/28/83 independent Reviewer: Name/Signature/Date

File No: 009-OPS92-076 Revision: 00 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 05 Group 14 Engineering Limit and Bases

PARAMETER: Containment Pressure

PREPARED BY: <u>Will B. Dawes</u> Cognizant Engineer (Print Name)

Cognizant Engineer (Signature) Date: 10 26.92

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists ______ of QAM-101.

Patrie Name

Signature

10-26-92

Independent Reviewer

APPROVED BY:

2

Cogn Manager (Print Name) Cogni (Signature) Engineering

File No: 009-OPS92-076 Revision: 00 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

1.

Group: 14

Parameter:

Containment Pressure

Step Value(s): Use(s):

STABLE OR LOWERING To determine if containment pressure is stable or lowering in order to allow continued use of the present success path, or direct the operator to a different success path.

1.1

Engineering Limit(s):

None.

Bases for Engineering Limit(s):

There are no associated engineering limits for the trending of parameters. Since no value is specified in the trend, no value will be assigned to the engineering limit. Usually, when an operator is instructed to trend an indication, the indication is used in conjunction with other parameters to corroborate the condition of a safety function. An operator is not required to perform a safety related action on the trending of a single parameter by itself in the EOIs. Where the trending of a parameter, the values given for the operating limits on that evaluated for their engineering limits.

Assumptions:

None.

References:

None.

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL OAM-101

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: Modula 05 Broup 14 / 009-075 90-076 /00

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
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- 8. Was an appropriate design method used?

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- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?
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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL EA BOWN BOVEN QAM-101

QAP 3.10 REVISION 1 PAGE 5 OF 5

- Are the acceptance criteria incorporated in the design documents sufficient to allow 17. verification that design requirements have been satisfactorily accomplished?
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Comments/Remarks:

Patal Junk 10-26-92 Patrick I Forre

independent Reviewer: Name/Signature/Date

EXHIBIT 3.10-1

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File No: 009-0PS92-083 Revision: 00 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

 CLIENT:
 Southern California Edison
 PLANT:
 San Onofre 2&3

 PROJECT:
 ISOPS II Support
 C-E JOB NUMBER: 2001216

 DOCUMENT:
 Module 05
 Group 15
 Engineering Limit and Bases

 PARAMETER:
 Containment Pressure

 PREPARED BY:
 Will B. Dawes

 Cognizant Engineer (Print Name)

Cognizant Engineer (Signature)

Date: 10-20-92

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VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists ______ of QAM-101.

Petricle J Ferry Name

Independent Reviewer

//---Signature Date

APPROVED BY:

Cognizant gingering Manager (Print Name) Cogni Mahagei (Signature)

File No: 009-OPS92-083 Revision: 00 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

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Group: 15

Parameter: Containment Pressure

Step Value(s): Use(s):

CONSTANT OR LOWERING To evaluate the effectiveness of the present success path for control of containment temperature and pressure.

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STABLE OR LOWERING

Engineering Limit(s):

None.

Bases for Engineering Limit(s):

There are no associated engineering limits for the trending of parameters. Since no value is specified in the trend, no value will be assigned to the engineering limit. Usually, when an operator is instructed to trend an indication, the indication is used in conjunction with other parameters to corroborate the condition of a safety function. An operator is not required to perform a safety related action on the trending of a single parameter by itself in the EOIs. Where the trending of a parameter is combined with specified operating limits on that parameter, the values given for the operating limits are evaluated for their engineering limits.

Assumptions:

None.

References:

None.

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Tile/Number/Revision: Module 05 Broup 15 / 009-08592 -083/00

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda properly identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- 7. Have the design interface requirements been satisfied?
- 8. Was an appropriate design method used?

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- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required application?
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair?
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?
- 16. Has the design properly considered radiation exposure to the public and plant personnel?

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QAM-101	QUALITY ASSURANCE PROCEDURES MANUAL	ABB COMBUSTION ENGINEERING NUCLEAR POWER

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QAP 3.10 REVISION 1 PAGE 5 OF 5

	Comments/Remarks:	25. Are requirements for record preparation review, approval, retention. etc., adequately specified?	24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?	23. Is the presentation legible and reproducible?	22. Are all pages sequentially numbered and marked with a valid number?	21. Has an appropriate the page been used?	20. Are adequate identification requirements specified?	19. Are adequate handling, storage, cleaning and shipping requirements specified?	18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified?	17. Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactority accomplished?
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EXHIBIT 3.10-1

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File No: 009-OPS92-106 Revision: 00 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER: 2001216

DOCUMENT: Module 05 Group 16 Engineering Limit and Bases

PARAMETER: Containment Pressure

PREPARED BY:

Will B. Dawes Cognizant Engineer (Print Name)

Cognizant Engineer (Signature)

Date: 11-3-92

VERIFICATION STATUS: COMPLETE

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $\underline{9}$ of QAM-101.

Kenneth E. Faulkarr Name Independent Reviewer Kenneth E. Falkner Signature

APPROVED BY:

Engineering Manager (Print Name) Cognizant Manager (Signature) Cogniza

<u>11/5/42</u> Date

File No: 009-OPS92-106 Revision: 00 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 16

Parameter: Containment Pressure

Step Value(s): Use(s):

< 3.4 PSIG To determine if event re-diagnosis is required during performance of the SBO procedure.

Engineering Limit(s):

Upper Limit: 9.2 PSIG

Bases for Engineering Limit(s):

The limit is based on the maximum expected containment pressure during a Station Blackout (SBO) event with a four hour duration (Ref 1). Pressure greater than 9.2 PSIG is an indication that an event other than an SBO is occurring, and that transition to another event based procedure, or to the functional recovery procedure is required.

Assumptions:

1. 11 GPM RCS leak rate prior to the SBO event.

 100 GPM leak rate during the SBO event due to failure of all Reactor Coolant Pump seals.

References:

 Memo from Paul Curry to Bill Watson, October 30, 1992, regarding unissued SCE Calculation N-4080-025, which determines peak containment pressure following a four hour station blackout.

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL OAM-101

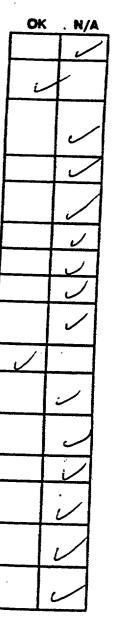
CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checidist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checidist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: Mod. 5 Group 16 Containment Pressure/ 009-0P592-106/ Rev. 00 -

- 1. Were the inputs correctly selected and incorporated into the design?
- is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda properly identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- 7. Have the design interface requirements been satisfied?
- 8. Was an appropriate design method used?
- 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?
- 10. Is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required application?
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair?
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?
- 16. Has the design properly considered radiation exposure to the public and plant personnel?



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File No: 009-OPS92-092 Revision: 01 Page: 1 of 3

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 05 Group 01 Engineering Limit and Bases

PARAMETER: Containment Temperature

PREPARED BY: John M. Flaherty rev. 01 Cognizant, Engineer (Print Name) Date: ' Engineer (Signature) Cognizan

<u>VERIFICATION STATUS: COMPLETE</u> The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists <u>No 7</u> of QAM-101.

MARTIN GREER Name

Independent Reviewer

Signature

APPROVED BY:

Coan Engineer ing Manager (Print Name) Cognizant (Engineering Manager (Signature)

File No: 009-OPS92-092 Revision: 01 Page: 2 of 3

SONGS 223 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 01

Parameter: Containment Temperature

Step Value(s): Use(s):

 $< 120^{\circ}F$

To verify expected post-trip containment temperature conditions.

< 120'F To determine if containment conditions indicate an event other than SGTR is in progress.

< 120°F To confirm that an event other than an LOFW is not taking place.

< 120°F

To verify containment temperature < 120°F and direct event re-diagnoses if it is not.

Engineering Limit(s):

Upper Limit: 120°F

Bases for Engineering Limit(s):

This value was selected to verify that containment temperature remains below the upper limit for normal containment temperature. In the absence of a loss of coolant accident or a steam or feed line break inside containment, an energy release to the containment is not expected (Ref 4). If an energy release is indicated, a re-diagnosis of the plant conditions is directed, and the in-use procedure is exited in favor of the proper eventbased procedure, or the functional recovery procedure.

120'F is based on engineering judgement as the maximum temperature which will be observed without an energy release to containment. This value coincides with the containment

File No: 009-OPS92-092 Revision: 01 Page: 3 of 3

temperature limit specified in Technical Specification 3.6.1.5, Limiting Condition for Operation (LCO) on Containment Temperature (Ref 1 and 2). The limitation ensures that overall average containment air temperature does not exceed conditions assumed in the accident analyses, thus limiting component temperatures to their design temperatures or below (Ref 3).

Assumptions:

| rev. 01

1. In accordance with NES&L Quality Procedure S023-XXIV-7-15, the references noted below are considered to be Secondary Design documents. Their use as reference documents for the engineering limit basis is assumed to be justified based on ensuring that the engineering limit is consistent with the current design basis and operating license.

Ref: 1,2,3

| rev. 01

2. The references noted below are assumed to be Secondary Design documents. This assumption is justified based on the fact that they describe strategies which have been reviewed and commented on by the NRC.

Ref: 4

References:

- 1. San Onofre Technical Specifications, Unit 2 Amendment 94, Limiting Condition For Operation 3.6.1.4 and its Bases.
- 2. San Onofre Technical Specifications, Unit 3 Amendment 84, Limiting Condition For Operation 3.6.1.4 and its Bases.
- 3. <u>San Onofre 2 & 3 Updated FSAR</u>, Section 6.2, Containment Systems, Rev 8.
- 4. CEN-152, <u>Emergency Procedure Guidelines</u>, Rev. 3.

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL

QAP 3.10 REVISION 1 PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checklist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checklist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document The/Number/Revision:_ 009-0ps92-692 _ --OK 1. Were the inputs correctly selected and incorporated into the design? N/A 2. Is the material presented sufficiently detailed as to purpose, method, assumptions, 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed? L 4. Are the appropriate quality and quality assurance requirements specified? 5. Are the applicable codes, standards and regulatory requirements including issue and addenda property identified, and are their requirements for design met? 6. Here applicable construction and operating experience been considered? Have the design interface requirements been satisfied? 7. 8. Was an appropriate design method used? 9. Have the adjustment factors, uncertainties, and empirical correlations been correctly 10. Is the output (results and conclusions) reasonable compared to inputs? 11. Are the specified parts, equipment, and processes suitable for the required ap-12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed? 13. Here adequate maintenance features and requirements been specified? 14. Are accessibility and other design provisions adequate for performance of needed 15. Here adequate accessibility been provided to perform the in-service inspection expected to be required during the plant file? 16. Has the design properly considered radiation exposure to the public and plant



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Comments/Remarks

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Independent Reviewer: Name/Signature/Date

EXHIBIT 3.10-1

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File No: 009-OPS92-075 Revision: 00 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 05 Group 02 Engineering Limit and Bases **PARAMETER:** Containment Temperature

PREPARED BY:

John M. Flaherty Cognizant/Engineer (Frint Name) Date: 4/2 Cognizant Engineer (Signature)

<u>VERIFICATION STATUS: COMPLETE</u> The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists <u>No</u> of QAM-101. <u>MARTIN CRER</u> <u>Mark Mun</u> <u>Yudfs</u>

Independent Reviewer

Signature

APPROVED BY:

Cognizant ng Manager (Print Name) (Cognizant Ergineering Manager (Signature)

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File No: 009-OPS92-075 Revision: 00 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 02

Parameter: Containment Temperature

Step Value(s): Use(s):

< 215 •F To verify containment temperature and pressure criteria are satisfied for CIAS termination.

Engineering Limit(s):

None

Bases for Engineering Limit(s):

No applicable basis/reference was found (See Ref. 1).

Assumptions:

None

References:

1. EMail Message, "Boiler Plate for References," Paul Curry (SCE) to Bill Watson (ABB C-E), 3/1/93.



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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL .

QAP 3.10 **REVISION 1** PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checidist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checidist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

	Document Title/Number/Revision: 009-0P592 -075	Res.01	<u> </u>
	· · · ·	ОК	_** . N/A
	 Were the inputs correctly selected and incorporated into the design? 		
2	 Is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units? 		
•	Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed?		7
4	Are the appropriate quality and quality assurance requirements specified?		
5 .	Are the applicable codes, standards and regulatory requirements including issue and addenda properly identified, and are their requirements for design met?		
6.	Have applicable construction and operating experience been considered?		
7.	Have the design interface requirements been satisfied?		
8.	Was an appropriate design method used?		~
8.	Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?		
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11.	Are the specified parts, equipment, and processes suitable for the required application?		
12	Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?		
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14.	Are accessibility and other design provisions adequate for performance of needed maintenance and repair?		4
15.	Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant ille?		

16. Has the design properly considered radiation exposure to the public and plant

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL

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QAP 3.10 **REVISION 1** PAGE 5 OF 5

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- Are the acceptance criteria incorporated in the design documents sufficient to allow 17. verification that design requirements have been satisfactorily accomplished?
- 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified?
- Are adequate handling, storage, cleaning and shipping requirements specified? 19.
- Are adequate identification requirements specified? 20.
- 21. Has an appropriate title page been used?
- Are all pages sequentially numbered and marked with a valid number? 22
- is the presentation legible and reproducible? 23
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
- 25. Are requirements for record preparation review, approval, retention. etc., adequately

Comments/Remarks:

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TIN CREER / Martin Green 4/28/93 Independent Reviewer: Name/Signature/Date

EXHIBIT 3.10-1

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File No: 009-OPS92-173 Revision: 00 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 05 Group 03 Engineering Limit and Bases **PARAMETER:** Containment Temperature

PREPARED BY:

John M. Flaherty Cognizant, Engineer (Print Name) Cognizant Engineer (\$ignature)

Date: 479

VERIFICATION STATUS: COMPLETEThe Safety-Related design information contained in this
document has been verified to be correct by means of
Design Review using ChecklistsMatticeNo. 9
of QAM-101.MatticeMatticeMameSignatureNameSignatureIndependent Reviewer

APPROVED BY:

Cognizant Engineering Manager (Print Name)

Cognizant Engineering Manager (Signature)

File No: 009-OPS92-173 Revision: 00 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 03

Parameter: Containment Temperature

Step Value(s): Use(s):

< 215 'F To determine if CSAS should have actuated or should be actuated.

< 215 °F To evaluate the need to initiate containment spray operation.

STABLE OR To evaluate the need to initiate containment LOWERING spray operation.

< 215 °F To verify that CCAS is the appropriate success
path (via containment temp < 215 F and stable)
or direct the operator to a different success
path.</pre>

STABLE OR To verify that CCAS is the appropriate success LOWERING path (via containment temp < 215 F and stable) or direct the operator to a different success path.

Engineering Limit(s):

None

Bases for Engineering Limit(s):

No applicable basis/reference was found (See Ref. 1)

Assumptions:

None

References:

1.

EMail Message, "Boiler Plate for References," Paul Curry (SCE) to Bill Watson (ABB C-E), 3/1/93.

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

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QAP 3.10 REVISION 1 PAGE 4 OF 5

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CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

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A R B COMBUSTION ENCINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL	QAP 3.10 REVISION 1 PAGE 5 OF 5
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EXHIBIT 3.10-1	

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File No: 009-OPS92-078 Revision: 00 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 05 Group 04 Engineering Limit and Bases PARAMETER: Containment Temperature

PREPARED BY:

Will B. Dawes Cognizant Engineer (Print Name)

Cognizant Engineer (Signature)

Date: 11-1 92

VERIFICATION STATUS: COMPLETE

Cogniza

The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists $\underline{\Psi}$ of QAM-101.

Name

Signature

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Signature)

-92 Date

Independent Reviewer

APPROVED BY:

Cognizant ering Manager (Print Name)

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11/5/02

File No: 009-OPS92-078 Revision: 00 Page: 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 04

Parameter: Containment Temperature

Step Value(s): Use(s):

NOT RISING To verify conditions inside containment to be normal.

Engineering Limit(s):

None.

Bases for Engineering Limit(s):

There are no associated engineering limits for the trending of parameters. Since no value is specified in the trend, no value will be assigned to the engineering limit. Usually, when an operator is instructed to trend an indication, the indication is used in conjunction with other parameters to corroborate the condition of a safety function. An operator is not required to perform a safety related action on the trending of a single parameter by itself in the EOIs. Where the trending of a parameter, the values given for the operating limits on that evaluated for their engineering limits.

Assumptions:

None.

References:

None.

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checidist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checidist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

Document Title/Number/Revision: Module 05 Group 04/009-0P392-075/Revision:

- 1. Were the inputs correctly selected and incorporated into the design?
- 2. is the material presented sufficiently detailed as to purpose, method, assumptions, references, and units?
- 3. Are the assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent revertications when the detailed design activities are completed?
- 4. Are the appropriate quality and quality assurance requirements specified?
- 5. Are the applicable codes, standards and regulatory requirements including issue and addenda properly identified, and are their requirements for design met?
- 6. Have applicable construction and operating experience been considered?
- 7. Have the design interface requirements been satisfied?
- 8. Was an appropriate design method used?
- 8. Have the adjustment factors, uncertainties, and empirical correlations been correctly applied?
- 10. is the output (results and conclusions) reasonable compared to inputs?
- 11. Are the specified parts, equipment, and processes suitable for the required application?
- 12. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
- 13. Have adequate maintenance features and requirements been specified?
- 14. Are accessibility and other design provisions adequate for performance of needed maintenance and repair?
- 15. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?
- 16. Has the design properly considered radiation exposure to the public and plant personnel?

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL OAM-101

QAP 3.10 REVISION 1 PAGE 5 OF 5

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- 17. Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?
- 18. Have adequate pre-operational and subsequent periodic test requirements been appropriately specified?
- 19. Are adequate handling, storage, cleaning and shipping requirements specified?
- 20. Are adequate identification requirements specified?
- 21. Has an appropriate title page been used?
- 22. Are all pages sequentially numbered and marked with a valid number?
- 23. Is the presentation legible and reproducible?
- 24. Have all cross-outs or overstrikes in the documentation been initialed and dated by the author of the change?
- 25. Are requirements for record preparation review, approval, retention. etc., adequately specified?

Comments/Remarks: _

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Independent Reviewer: Name/Signature/Date

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File No: 009-OPS92-148 Revision: 00 Page: 1 of 2

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

CLIENT:Southern California EdisonPLANT:San Onofre 2&3PROJECT:ISOPS II SupportC-E JOB NUMBER:2001216

DOCUMENT: Module 05 Group 05 Engineering Limit and Bases **PARAMETER:** Containment Temperature

PREPARED BY:	John M. Flaherty		
	Cognizant Engineer (Print Name)		11
	for Whatston	Date:	4/27/93
	Cognizant Engineer (Signature)	•	· · · · · · · · · · · · · · · · · · ·

<u>VERIFICATION STATUS: COMPLETE</u> The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists <u>Mo 9</u> of QAM-101.

ARTIN GREER Name Signature Independent Reviewer

2006-9. MY

APPROVED BY:

10 J. R. Congdon Cognizant Engineering Manager (Print Name) 100 mahn Cognizant/Engineering Mangger (Signature)

 File No:
 009-OPS92-148

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 Page:
 2 of 2

SONGS 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

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Group: 05

Parameter: Containment Temperature

Step Value(s): Use(s):

< 145 'F To determine if event re-diagnosis is required.

< 145 'F To determine if the success path in use (contaiment temperature < 145 F) is acceptable, or direct the operator to a different success path.

Engineering Limit(s):

None

Bases for Engineering Limit(s):

No applicable Basis/Reference was found (See Ref. 1).

Assumptions:

None

References:

1.

EMail Message, "Boiler Plate for References," Paul Curry (SCE) to Bill Watson (ABB C-E), 3/1/93.

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Document Title/Number/Revision:_

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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

QAP 3.10 **REVISION 1** PAGE 4 OF 5

CHECKLIST NO. 9

REVIEW OF OTHER DESIGN DOCUMENTS

Checidist 1 (Exhibit 3.3-1 of QAP 3.3) shall be considered whenever this Checidist is used, and if applicable, the independent Reviewer shall include it in the reviewer's statement.

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	 Were the inputs correctly selected and incorporated into the design? 		
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5 .	addenda properly identified, and are their requirements for design mat?		
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7.	Have the design interface requirements been satisfied?		
8.	Was an appropriate design method used?		-
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12	Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?		
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14.	Are accessibility and other design provisions adequate for performance of needed maintenance and repair?		
15.	Hiss adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?		7
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Has the design properly considered radiation exposure to the public and plant **16**. personnel?

ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL 0AM-101

QAP 3.10 REVISION 1 PAGE 5 OF 5

- 17. Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?
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Comments/Remarks: ____

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Independent Reviewer: Name/Signature/Date

EXHIBIT 3.10-1

4/28/93

File No: 009-0PS92-138 **Revision:** 01 1 of 3 Page:

ABB COMBUSTION ENGINEERING ENGINEERING LIMIT DOCUMENT COVER SHEET

San Onofre 2&3 **CLIENT:** Southern California Edison PLANT: C-E JOB NUMBER: 2001216 PROJECT: ISOPS II Support

Group 06 Engineering Limit and Bases DOCUMENT: Module 05 **PARAMETER:** Containment Temperature

PREPARED BY:__ Joseph R. Congdon Cognizant Engineer (Print Name) Court Date: 4/28/43 Cognizant Engineer (Signature)

VERIFICATION STATUS: COMPLETE The Safety-Related design information contained in this document has been verified to be correct by means of Design Review using Checklists <u>Mo 9</u> of QAM-101.

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MARTIN GREER Name Independent Reviewer

APPROVED BY:

(Print Name) Cognizant Manager Cognizant Engineering Manager (Signature)

File No: 009-OPS92-138 Revision: 01 Page: 2 of 3

SONGE 2&3 INSTRUMENT SUITABILITY STUDY EMERGENCY OPERATING PROCEDURES

ENGINEERING LIMIT BASES DOCUMENT

Module: 05

Group: 06

Parameter: Containment Temperature

Step Value(s): Use(s):

CONSTANT OR To evaluate the effectiveness of the present LOWERING success path for control of containment temperature and pressure.

RISING To evaluate the effectiveness of the present success path for control of containment temperature and pressure.

STABLE OR To evaluate the effectiveness of the present LOWERING success path for control of containment temperature and pressure.

STABLE OR To determine if containment temperature is LOWERING stable or lowering in order to allow continued use of the present success path, or direct the operator to a different success path.

Engineering Limit(s):

None.

Bases for Engineering Limit(s):

There are no associated engineering limits for the trending of parameters. Since no value is specified in the trend, no value will be assigned to the engineering limit. Usually, when an operator is instructed to trend an indication, the indication is used in conjunction with other parameters to corroborate the condition of a safety function. An operator is not required to perform a safety related action on the trending of a single parameter by itself in the EOIs. Where the trending of a parameter, the values given for the operating limits on that evaluated for their engineering limits.

File No: 009-OPS92-138 Revision: 01 Page: 3 of 3

Assumptions:

None.

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References:

None.

CHECKLIST NO. 9 REVIEW OF OTHER DESIGN DOCUMENTS (Exhibit 3.3-1 of OAP 3.3) shall be considered whenever this Checklist is used, and if applicable.	l (applicab
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ABB COMBUSTION ENGINEERING NUCLEAR POWER QUALITY ASSURANCE PROCEDURES MANUAL QAM-101

QAP 3.10 REVISION 1 PAGE 5 OF 5

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Comments/Remarks:

marter Lee MARTIN GREER 4/24/93

Independent Reviewer: Name/Signature/Date

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