

Project:	TRICON v10 NUCLEAR QUALIFICATION PROJECT
-----------------	---


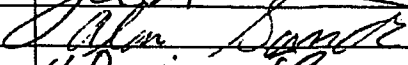
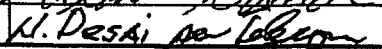
Non -Proprietary copy per 10CFR2.390
 - Areas of proprietary information have been redacted.
 - Designation letter corresponds to Triconex proprietary policy categories (Ref. transmittal number NRC-V10-09-001, Affidavit, Section 4.)

MASTER CONFIGURATION LIST

Document No: 9600164-540

Revision 22

August 07, 2009

	Name	Signature	Title
Author:	Frank Kloer		Project Engineer
Reviewer:	Alan Sands		Project QA Engineer
Approval:	Naresh Desai		Project Manager

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	2 of 30	Date:	08/07/09

a

REVISION HISTORY

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	3 of 30	Date:	08/07/09

a

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	4 of 30	Date:	08/07/09

a

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	5 of 30	Date:	08/07/09

a

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	6 of 30	Date:	08/07/09

TABLE OF CONTENTS

REQUIREMENTS DOCUMENTS AND PLANS7

PROCUREMENT DOCUMENTS8

ANALYSES AND CALCULATIONS9

SPECIFICATIONS AND DESCRIPTIONS11

TEST PROCEDURES12

TEST REPORTS13

EXECUTED TEST PROCEDURES15

TSAP VERIFICATION AND VALIDATION DOCUMENTS17

OTHER PROJECT DOCUMENTS18

SOFTWARE19

TRICON-UNDER-TEST (TUT) MODULE CONFIGURATION DATA20

TRICON-UNDER-TEST (TUT) SPARES DATA22

TRICON-UNDER-TEST (TUT) CONNECTING CABLES25

TRICON-UNDER-TEST (TUT) RTD ETP SIGNAL CONDITIONERS26

TRICON-UNDER-TEST (TUT) CONFIGURATION27

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	7 of 30	Date:	08/07/09

REQUIREMENTS DOCUMENTS AND PLANS

Document Description	Document Number	Revision	Date
Nuclear Qualification Quality Plan	9600164-002	3	11/08/06
Master Test Plan	9600164-500	4	05/02/07
Software Quality Assurance Plan	9600164-537	0	07/24/06

a



Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	8 of 30	Date:	08/07/09

PROCUREMENT DOCUMENTS

a

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	9 of 30	Date:	08/07/09

ANALYSES AND CALCULATIONS

Document Description	Document Number	Revision	Date
Analog Input/Output Machine Count Calculations	9600164-730 0		12/05/06
Maximum Response Time Calculations	9600164-731 0		12/05/06
External Termination Panel Interface Cable Similarity Analysis	9600164-538 0		05/22/07
Failure Modes and Effects Analysis	9600164-531	0	05/23/07
Reliability/Availability Study	9600164-532	0	05/23/07
Change Impact Analysis	9600164-542	0	7/24/07

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	10 of 30	Date:	08/07/09

DRAWINGS

a.

Document Number	Document Description	Revision	Date
	Wiring Schedule		
9600164-700 W			
9600164-100, Sht 1 - 5			
9600164-102, Sht 1 - 4			
9600164-103, Sht 1 - 2			
9600164-105, Sht 1 - 2			
9600164-200, Sht 1			
9600164-201, Sht 1 - 2			
9600164-202, Sht 1			
9600164-203, Sht 1 - 2			
9600164-204, Sht 1 - 2			
9600164-205, Sht 1 - 2			
9600164-206, Sht 1			
9600164-207, Sht 1			
9600164-300, Sht 1			
9600164-600, Sht 1 - 2			
9600164-601, Sht 1			
9600164-602, Sht 1 - 4			
9600164-603, Sht 1 - 3			
9600164-604, Sht 1			
9600164-605, Sht 1			
9600164-606, Sht 1 - 3			
9600164-607, Sht 1			
9600164-608, Sht 1 - 8			
9600164-609, Sht 1 - 3			
9600164-610, Sht 1 - 6			
9600164-611, Sht 1 - 3			
9600164-612, Sht 1			
9600164-613, Sht 1 - 5			
9600164-614, Sht 1 - 11			

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	12 of 30	Date:	08/07/09

TEST PROCEDURES

Document Description	Document Number	Revision	Date
Invensys Triconex			
System Setup & Checkout Procedure	9600164-502	4	04/26/07
Operability Test Procedure	9600164-503	3	01/22/07
Prudency Test Procedure	9600164-504	1	12/19/06
MPR Associates			
Environmental Test Procedure	9600164-506	0	12/12/06
Radiation Exposure Test Procedure	9600164-511	0	12/12/06
Seismic Test Procedure	9600164-507	0	01/15/07
EMI/RFI Test Procedure	9600164-510	0	02/06/07
EFT Test Procedure	9600164-514	0	03/08/07
Surge Withstand Test Procedure	9600164-508	1	03/28/07
ESD Test Procedure	9600164-512	1	04/04/07
Class 1E Isolation Test Procedure	9600164-509	0	03/29/07
National Technical Systems			
<u>Procedure for Environmental Qualification</u>			
<u>Procedure for Radiation Testing TP6</u>			
<u>Procedure for Seismic Qualification</u>			
<u>Procedure for EMI Qualification</u>			

a

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	13 of 30	Date:	08/07/09

TEST REPORTS

Document Description	Document Number	Revision	Date
Setup & Checkout Test Report, Initial Test	9600164-550 1		7/26/07
Setup & Checkout Test Report, Pre-Qualification Test	9600164-551 1		7/26/07
Operability Test Report, Pre-Qualification Test	9600164-560 1		7/26/07
Prudency Test Report, Pre-Qualification Test	9600164-570 1		7/26/07
Setup & Checkout Test Report, Post-Radiation Test	9600164-552 1		7/26/07
Operability Test Report, Post-Radiation Test	9600164-561 1		7/26/07
Prudency Test Report, Post-Radiation Test	9600164-571 1		7/26/07
Operability Test Report, High Temperature	9600164-562 0		7/26/07
Prudency Test Report, High Temperature	9600164-572 0		7/26/07
Operability Test Report, Low Temperature	9600164-563 0		7/26/07
Operability Test Report, Ambient Temperature	9600164-564 0		7/26/07
Setup & Checkout Test Report, Pre-Seismic Chassis 1 & 2	9600164-553 0		7/26/07
Setup & Checkout Test Report, Pre-Seismic Chassis 2 & 3	9600164-554 0		7/26/07
Operability Test Report, Post-Seismic	9600164-565	0	7/26/07
Setup & Checkout Test Report, Pre-EMI/RFI	9600164-555 0		7/26/07
Setup & Checkout Test Report, Performance Proof	9600164-556 0		7/26/07
Operability Test Report, Performance Proof	9600164-566 0		7/26/07
Prudency Test Report, Performance Proof	9600164-573 0		7/26/07
Seven Day Elevated DC Voltage Setup and Checkout Test Report	9600164-557 0		7/26/07
Setup & Checkout Test Report, Pre-Supp IEC 4-16 Test	9600164-556,3.2, 4-16	0 01/23/08	

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	14 of 30	Date:	08/07/09

Operability Test Report, Pre-Supp IEC 4-16 Test	9600164-566,3.1, 4-16	0	01/23/08	
Prudency Test Report, Pre-Supp IEC 4-16 Test	9600164-573,3.1, 4-16	0	01/23/08	
Operability Test Report, Pre-Supp IEC 4-16 Test	9600164-566,3.7, 4-16	0	01/23/08	
Prudency Test Report, Pre-Supp IEC 4-16 Test	9600164-573,3.3, 4-16	0	01/23/08	

MPR Associates

Radiation Exposure Test Report	9600164-533	1		04/30/08
Environmental Test Report	9600164-525	0		07/17/07
Seismic Test Report	9600164-526	0		07/17/07
EFT Test Report	9600164-521	1		04/30/08
ESD Test Report	9600164-522	1		04/30/08
Surge Withstand Test Report	9600164-528	1		04/30/08
Class 1E Isolation Test Report	9600164-529	1		04/30/08
EMI/RFI Test Report	9600164-527	2		04/30/08

National Technical Systems

Seismic Test Report				
Environmental Test Report				
Radiation Exposure Test Report				
EMC Test Report				

a.

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	15 of 30	Date:	08/07/09

EXECUTED TEST PROCEDURES

Document Description	Document Number	Executed Revision	TRB Approval
Invensys Triconex			
Setup & Checkout Procedure, Initial Test	9600164-502-3.1	0/ICN001	07/23/07
Setup & Checkout Procedure, Pre-Qualification Test	9600164-502-3.2	1/ICN001	07/23/07
Operability Test Procedure, Pre-Qualification Test	9600164-503-3.1	1/ICN001	07/23/07
Prudency Test Procedure, Pre-Qualification Test	9600164-504-3.1	0/ICN001	07/23/07
Setup & Checkout Procedure, Post-Radiation Test	9600164-502-3.3	2	07/17/07
Operability Test Procedure, Post-Radiation Test	9600164-503-3.2	2	07/17/07
Prudency Test Procedure, Post-Radiation Test	9600164-504-3.2	1	07/17/07
Operability Test Procedure, HT Environmental Test	9600164-503-3.3	2	07/17/07
Prudency Test Procedure, Environmental Test	9600164-504-3.3	1	07/17/07
Operability Test Procedure, LT Environmental Test	9600164-503-3.4	2	07/17/07
Operability Test Procedure, AT Environmental Test	9600164-503-3.5	2/ICN001	07/17/07
Setup & Checkout Procedure, Pre-Seismic Test (1&2)	9600164-502-3.4	3	07/17/07
Setup & Checkout Procedure, Pre-Seismic Test (3&4)	9600164-502-3.5	3	07/17/07
Operability Test Procedure, Post-Seismic Test	9600164-503-3.6	3	07/17/07
Setup & Checkout Procedure, Pre-EMI/RFI Test	9600164-502-3.6	3	07/23/07
Setup & Checkout Procedure, Perf.-Proof Test	9600164-502-3.11	4	07/23/07
Operability Test Procedure, Perf.-Proof Test	9600164-503-3.7	3	07/23/07
Prudency Test Procedure, Perf.-Proof Test	9600164-504-3.4	1	07/23/07
Setup & Checkout Procedure, Elevated DC Test	9600164-502-3.12	4	07/23/07
Setup & Checkout Procedure, Pre-Qual., Supp. 4-16	9600164-502-3.2, Supp 4-16	4 01/25/08	
Operability Test Procedure, Pre-Qual., Supp. 4-16	9600164-503-3.1, Supp 4-16	3 01/25/08	
Prudency Test Procedure, Pre-Qual., Supp. 4-16	9600164-504-3.1, Supp 4-16	1 01/25/08	
Operability Test Procedure, Perf.-Proof, Supp. 4-16	9600164-503-3.7, Supp. 4-16	3 01/25/08	
Prudency Test Procedure, Perf.-Proof, Supp. 4-16	9600164-504-3.3, Supp. 4-16	1 01/25/08	
MPR Associates			
Environmental Test Procedure	9600164-506	0	07/17/07
Radiation Exposure Test Procedure	9600164-511	0	07/17/07
Seismic Test Procedure	9600164-507	0	07/17/07
EMI/RFI Test Procedure	9600164-510	0	07/23/07
EFT Test Procedure	9600164-514	0	07/17/07

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	16 of 30	Date:	08/07/09

Surge Withstand Test Procedure	9600164-508	1	07/17/07
ESD Test Procedure	9600164-512	1	07/17/07
Class 1E Isolation Test Procedure	9600164-509	0	07/17/07

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	17 of 30	Date:	08/07/09

TSAP VERIFICATION AND VALIDATION DOCUMENTS

Document Description	Document Number	Revision	Date
TSAP Software Verification and Validation Plan	9600164-513	2	12/01/06
TSAP V&V Requirements Phase Summary Report	9600164-710	0	10/04/06
TSAP V&V Design Phase Summary Report	9600164-711	0	11/17/06
TSAP V&V Implementation Phase Summary Report	9600164-712	0	11/20/06
TSAP V&V Test Phase Summary Report	9600164-713	0	12/01/06
TSAP Verification Specification & Plan	9600164-714	0	11/10/06
TSAP Validation Test Specification & Plan	9600164-715	0	11/10/06
TSAP Software Validation Test (SVT) Procedure	9600164-716	0	11/20/06
TSAP Software Validation Test Report	9600164-717	0	11/30/06
Executed TSAP SVT Procedure	9600164-716	0	11/30/06
TSAP IEEE 1012 Software Traceability Analysis	9600164-720	0	11/29/06
TSAP Final V&V Report	9600164-536	0	12/07/06
TSAP Software Development Checklist	9600164-515	0	12/08/06

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	18 of 30	Date:	08/07/09

OTHER PROJECT DOCUMENTS

Document Description	Document Number	Revision	Date
Equipment Qualification (EQ) Summary Report	9600164-545	3	08/03/09
System Description	9600164-541	0	07/26/07
System Accuracy Specification	9600164-534	0	07/26/07
Nuclear Qualification Equipment List	9100150-001	1.0	07/30/07
Software Qualification Report	9600164-535	1	08/05/09
Critical Digital Review	9600164-539	1	08/04/09
Supplemental Test Plan	9600164-800	0	01/14/08

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	19 of 30	Date:	08/07/09

SOFTWARE

Type	Identification		Version
Programming Software	TriStation 1131		4.1.437
Module Firmware	Module Type	Firmware	Level
4200, 3701 3708E, 3511 3805E 3601T, 3603T 3636T 3623T	3008	ETSX	6198 (Build 92)
	3008	IOCOM	6054 (Build 92)
	4352A	TCM	6136 (Build 92)
	4201	RXM	3310
		AI/NITC	5661
	3703E	EIAI/ITC	5916
		EPI	5647
	3501T, 3502E, 3503E	EDI	5909
		EAO	5897
	3607E	EDO	5781
		TSDO	5502
		ERO	5777
		TSDO2	5940
	3721	AI(DIFF)	6200 (Build 92)
3625	DO(SUPV)	6213 (Build 92)	
Application Software			
Test Software	DAS:		
Test Aids	Triconex Triconex		

a

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	20 of 30	Date:	08/07/09

TRICON-UNDER-TEST (TUT) MODULE CONFIGURATION DATA

a

Module Type/Description
Chassis:
8110, High Density (HD) Main Chassis
8111, HD Expansion Chassis
8112, HD Remote Expansion Chassis
Power Supply:
8310, HD Power Module, 115 VAC/DC
8311, HD Power Module, 24 VDC
8312, HD Power Module, 230 VAC
Main Processor (MP):
3008, Enhanced MP III, v10, 16Mb
Remote Extender:
4200, Remote Extender Module
4201, Remote Extender Module
Communication:
4352A, Tricon Communication Module
Analog Input:
3701, AI Module, 0-10 VDC
3703E, AI Module, 0-10 VDC
3721, AI Module, 0-5 VDC
Analog Output:
3805E, AO Module, 4-20 mA
Digital Input:
3501T, DI Module, 115 VAC/DC
3502E, DI Module, 48 VAC/DC
3503E, DI Module, 24VAC/DC
Digital Output:
3601T, DO Module, 115 VAC
3603T, DO Module, 120 VDC
3623T, SDO Module, 120 VDC

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	21 of 30	Date:	08/07/09

a.

Module Type/Description
3607E, DO Module, 48 VDC
3625, DO Module, 24 VDC
Pulse Input:
3511, PI Pulse Input Module
Thermocouple:
3708E, AI Thermocouple Input Module
Relay Output:
3636T, RO Module, NO, Simplex
Miscellaneous:
8105, Blank I/O Slot Panel
8107, Seismic Balance Module
Chassis Mounting Brackets

*Tested with the prototype 3000182-001, Revision J welded chassis.

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	22 of 30	Date:	08/07/09

TRICON-UNDER-TEST (TUT) SPARES DATA

a

Module Type/Description
Chassis:
8110, High Density Main Chassis
8111, High Density Expansion Chassis
8112, High Density Remote Expansion Chassis
Power Supply:
8310, High Density Power Module, 115 VAC/DC
H0680298
H0687925
H0681706
H0681709
8311, High Density Power Module, 24 VDC
H0687943
8312, High Density Power Module, 230 VAC
H0682324
J0681015
J0681283
Main Processor:
3008, Enhanced Main Processor III, v10, 16Mb
Remote Extender:
4200, Remote Extender Module
I0609268
4201, Remote Extender Module
F0600486
Communication:
4352A, Tricon Communication Module
D0607837
B0601123
Analog Input:
3701, AI Module, 0-10 VDC
3703E, AI Module, 0-10 VDC

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	23 of 30	Date:	08/07/09

a

Module Type/Description
3721, AI Module, 0-5 VDC
J0633054
I0638928
Analog Output:
3805E, AO Module, 4-20 mA
Digital Input:
3501T, DI Module, 115 VAC/DC
K0619309
3502E, DI Module, 48 VAC/DC
3503E, DI Module, 24VAC/DC
A0711386
Digital Output:
3601T, DO Module, 115 VAC
3603T, DO Module, 120 VDC
F0629348
F0627970
3623T, SDO Module, 120 VDC
G0626631
3607E, DO Module, 48 VDC
3625, DO Module, 24 VDC
D06P6732
Pulse Input:
3511, PI Pulse Input Module
Thermocouple:
3708E, AI Thermocouple Input Module
Relay Output:
3636T, RO Module, NO, Simplex

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	24 of 30	Date:	08/07/09

TRICON-UNDER-TEST (TUT) EXTERNAL TERMINATION PANELS (ETP)

a

Model
9794-110N PI
9782-110N AI
9561-810N DI
9561-110N DI
9664-810N DO
9664-810N DO
9663-610N DO
9563-810N DI
9662-810N DO
9662-610N DO
9668-110N RO
9667-810N DO
9562-810N DI
9783-110N AI
9795-610N AI
9790-610N AI
9783-110N AI
9860-610N AO
9764-310N AI
9783-110N AI
9790-610N AI
9783-110N AI

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	25 of 30	Date:	08/07/09

TRICON-UNDER-TEST (TUT) CONNECTING CABLES

a.

Part Number
4000050-006
4000056-006
4000142-510N
4000142-510N
4000140-110N
4000140-110N
4000141-110N
4000141-110N
4000141-110N
4000140-310N
4000093-310
4000094-310
4000141-310N
4000094-110
4000141-110N
4000141-210N
4000093-210
4000140-210N
4000103-510
4000103-510
4000142-510N
4000142-510N
4000157-510N
4000142-510N
4000142-510N
4000142-510N
4000142-510N
4000142-510N

Document:	9600164-540	Title:	Master Configuration List		
Revision:	22	Page:	26 of 30	Date:	08/07/09

TRICON-UNDER-TEST (TUT) RTD ETP SIGNAL CONDITIONERS

Part Number	Rev.	Description	Assembly/Model Number	Qty
1600083-200	0	Signal Conditioner (0 to 200 °C) Pt	7B34-CUSTOM	2
1600083-600	0	Signal Conditioner (0 to 600 °C) Pt	7B34-CUSTOM	2
1600024-010	0	Signal Conditioner (-100 to 100 °C) Pt	7B34-01-1	2
1600024-020	0	Signal Conditioner (0 to 100 °C) Pt	7B34-02-1	2
1600024-030	0	Signal Conditioner (0 to 200 °C) Pt	7B34-03-1	2
1600024-040	0	Signal Conditioner (0 to 600 °C) Pt	7B34-04-1	2
1600082-001	0	Signal Conditioner (0 to 100 mV)	7B30-02-1	2
1600081-001	0	Signal Conditioner (0 to 120 °C) Cu	7B14-C-02-1	2

Document:	9600164-510	Title:	Master Configuration List		
Revision:	21	Page:	27 of 30	Date:	01/25/08

TRICON-UNDER-TEST (TUT) CONFIGURATION

a

CHASSIS #1

|| Spare Module Swap – Surge/Isolation Testing Only

|| Final Testing



Document:	9600164-540	Title:	Master Configuration List		
Revision:	21	Page:	28 of 30	Date:	01/16/08

CHASSIS #2

|| Spare Module Swap – Surge/Isolation Testing Only

|| Final Testing

a



Document:	9600164-540	Title:	Master Configuration List		
Revision:	21	Page:	29 of 30	Date:	01/16/08

CHASSIS #3

|| Spare Module Swap – Surge/Isolation Testing Only

|| Final Testing

a



Document:	9600164-540	Title:	Master Configuration List		
Revision:	21	Page:	30 of 30	Date:	01/16/08

CHASSIS #4

|| Spare Module Swap – Surge/Isolation Testing Only

|| Final Testing

a