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REVISION HISTORY

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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

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PROCUREMENT DOCUMENTS

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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

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DRAWINGS

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Document Number	Document Description	Revision	Date
	Wiring Schedule		
9600164-700			
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			
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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			
Procedure for Environmental Qualification			
Procedure for Radiation Testing			
Procedure for Seismic Qualification			
Procedure for EMI Qualification			

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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	

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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

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National Technical Systems

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

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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

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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

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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

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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

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TRICON-UNDER-TEST (TUT) MODULE CONFIGURATION DATA

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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

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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.

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TRICON-UNDER-TEST (TUT) SPARES DATA

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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
8311, High Density Power Module, 24 VDC
8312, High Density Power Module, 230 VAC
Main Processor:
3008, Enhanced Main Processor 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

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Module Type/Description
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
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

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

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Model
9794-110N
9782-110N
9561-810N
9561-110N
9664-810N
9664-810N
9663-610N
9563-810N
9662-810N
9662-610N
9668-110N
9667-810N
9562-810N
9783-110N
9795-610N
9790-610N
9783-110N
9860-610N
9764-310N
9783-110N
9790-610N
9783-110N

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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

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TRICON-UNDER-TEST (TUT) CONFIGURATION

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CHASSIS #1

|| Spare Module Swap – Surge/Isolation Testing Only

|| Final Testing



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CHASSIS #2

|| Spare Module Swap – Surge/Isolation Testing Only

|| Final Testing

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CHASSIS #3

|| Spare Module Swap – Surge/Isolation Testing Only || Final Testing

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CHASSIS #4

|| Spare Module Swap – Surge/Isolation Testing Only || Final Testing