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Operations Management

Letter No. NRC-V10-10-003

April 6, 2010

PROJ 709

United States Nuclear Regulatory Commission
Mr. Jonathon Rowley, Project Manager
M/S 12D2
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Subject: Nuclear Safety Related Qualification of the Tricon TMR Programmable Logic Controller (PLC) – Update to Qualification Summary Report Submittal and "Application for Withholding Proprietary Information from Public Disclosure" (TAC NO. ME1906)

References:

1. Letter, J. Polcyn (Invensys) to NRC, June 1, 2009, subject: NRC Safety Evaluation Report, "Review of Triconex Corporation Topical Reports 7286-545, Qualification Summary Report, and 7286-546, Amendment 1 to Qualification Summary Report, Revision 1", Letter No. NRC-V10-09-001.
2. Letter, B. Haynes (Invensys) to NRC, December 4, 2009, subject: Nuclear Safety Related Qualification of the Tricon TMR Programmable Logic Controller (PLC) – Update to Qualification Summary Report Submittal – Triconex Product User Guides & Manuals, Letter No. NRC-V10-09-009.

In preparation for the NRC safety evaluation of the V10 Tricon TMR PLC, the staff visited Invensys at its Irvine, California, facility on January 21 and 22, 2010. As part of the information exchange that occurred over the two days, Invensys presented to the staff on various technical issues. The staff provided feedback on the technical presentations, and made a number of useful suggestions on the information the staff would need for the safety evaluation of the V10 Tricon TMR PLC. Invensys committed to submitting the following documents to support the staff review:

(1) A revised topical report on the V10 Tricon TMR PLC, to include a redline-strikeout version that clearly annotates the differences between the V9 and V10 Tricon versions;

(2) An expanded list of V10 Tricon TMR PLC technical documents as specified in ISG6; during the January information exchange, the staff and Invensys performed a line-by-line review of the ISG6 table to finalize the list of documents to submit for the safety evaluation;

(3) A whitepaper, NTX-SER-09-06 describing the process Invensys follows during the development of programmable logic devices, field programmable gate arrays (FPGAs), etc.; the document will address legacy development up to and including V10.5, as well as the process going forward to ensure recent NRC guidance on FPGA-based safety systems is incorporated into future Tricon releases;

(4) A Program Manual that will govern the Tricon TMR PLC nuclear system integration process, including nuclear application software development; this will be a revision to NTX-SER-09-21;

(5) A revision to document SER Maintenance Process, NTX-SER-09-20, that clarifies and enhances the proposed SER maintenance process as compared to previous revisions of the paper;

(6) A revision to the Invensys ISG2 & ISG4 Compliance Paper, NTX-SER-09-10, that incorporates technical details into the discussion on conformance of the V10 Tricon TMR PLC communication features and protocols to the staff guidance on safety system communications; and

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(7) A revision to Tricon V9.5.3 to V10.2.1 Differences Document, NTX-SER-09-05, that provides additional clarity on product software configuration, structure, and development path; and

(8) A revision to the Invensys Cyber Security Program Plan Licensing Topical Report (LTR) that will address anticipated regulatory changes as presented in Draft Guide-1249.

Items 1 and 2 in the above list are enclosed in this letter. For item 2 specifically, two CDs containing an additional 54 documents as listed in the attachment, are enclosed. It is expected that these additional 54 documents along with the documents submitted since September 2009 provide the staff with enough information to accept the submittal package for formal review and approval. The revised documents in items 3 through 8 are amplifications and/or clarifications of technical information already provided to the staff to help minimize requests for additional information during the formal review of the V10 Tricon TMR PLC. Items 3 through 8, above, will be submitted in accordance with the following schedule:

Document	Anticipated Submittal Date
Triconex Development Processes For Programmable Logic Devices In Nuclear-Qualified Products, NTX-SER-09-06, Revision 0	April 9, 2010
Nuclear System Integration Program Manual, NTX-SER-09-21[1], Revision 1	April 16, 2010
Invensys-Triconex SER Maintenance Process, NTX-SER-09-20, Revision 1	April 9, 2010
Tricon Applications in Nuclear Reactor Protection Systems – Compliance with NRC Interim Guidance ISG2 & ISG4, NTX-SER-09-10, Revision 1	April 16, 2010
Differences between the Tricon V9.5.3 System and the Tricon V10.2.1 System, NTX-SER-09-05, Revision 2	April 9, 2010
Invensys Security Program LTR, 7286-545-2-P[2], Revision 1	May 7, 2010

[1]Document formerly titled, "Summary of The Invensys Project Procedures Manual for Safety-Related Work"
[2]Document formerly titled, "Invensys Cyber Security Program Plan Licensing Topical Report"

With the exception of the last document in the above table, the remaining submittals are in final technical review or managerial review for approval. The Invensys Security Program LTR is undergoing significant revision to incorporate recent changes to NRC regulatory positions regarding vendor responsibilities for security of digital safety systems, as proposed in Draft Guide 1249 (Revision 3 to Regulatory Guide 1.152) and presented during the 2010 Regulatory Information Conference.

Invensys is also providing this letter as our "Application for Withholding" pursuant to the provisions of 10 CFR Part 2.390, Paragraph (b)(1). This submittal contains commercial strategic information proprietary to Invensys and customarily held in confidence. As previously identified in this letter, the proprietary material for which this withholding is requested has been specifically identified. In accordance with 10 CFR Part 2.390, Affidavit No. TCXNRC-10-01 accompanies this transmittal and sets forth the basis for which the identified proprietary information may be withheld from public disclosure. Accordingly, it is respectfully requested that the specified information which is proprietary to Invensys be withheld from public disclosure in accordance with 10 CFR Part 2.390.

Invensys has given its best effort to address all of the staff's comments and questions pertinent to the V10 Tricon TMR PLC to ensure an expeditious safety evaluation. However, we recognize that additional information may be required by the staff. We look forward to supporting the staff on this important effort.

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Operations Management

Letter No. NRC-V10-10-003

Correspondence with regard to this transmittal should be directed to the following:

Mr. Brian Haynes
Project Manager
Invensys
15345 Barranca Parkway
Irvine, California 92618

If there are any questions on this submittal or any of its enclosures, please contact me at (949) 885-0778.

Sincerely,

Brian Haynes
Project Manager
Invensys

cc: Ms. Stacey Rosenberg, Branch Chief – NRR – CDs Only
Mr. Jonathon Rowley, Project Manager – NRR – CDs Only
Mr. William Kemper, Branch Chief – NRR – CDs Only
Mr. Richard Lilleston – Invensys – Letter Only
Mr. Andy Sykes – Invensys – Letter Only
Mr. Steve Blair – Invensys – Letter Only
Mr. Clayton Scott – Invensys – Letter Only

Attachment/Enclosures

ATTACHMENT 1
Enclosure Listing – CD 10 & 11 Content

Enclosure Description	*CD10**	*CD11*	*[filename] [size MB]*
Enclosure 1: - Affidavit #TCXNRC-10-01	X	X	*[134_Affidavit10_1.pdf] [0.3]*
Enclosure 2: New Supplemental Documents/ISG6			
MDM 12.1, Production Order Tag Report*	X	---	*[080_MDM_12_1_P.pdf] [0.5]*
QPM 2.1, Quality Planning*	X	---	*[081_QPM_2_1_P.pdf] [0.5]*
QPM 13.2, Product Discrepancies*	X	---	*[082_QPM_13_2_P.pdf] [0.5]*
EDM 11.03, Process and Product Quality Assurance*	X	---	*[083_EDM_11_03_P.pdf] [0.5]*
EDM 12.00, Product Development Process*	X	---	*[084_EDM_12_00_P.pdf] [0.7]*
EDM 12.10, Project Planning*	X	---	*[085_EDM_12_10_P.pdf] [0.6]*
EDM 12.50, Requirements Management*	X	---	*[086_EDM_12_50_P.pdf] [0.6]*
EDM 20.00, Configuration Management*	X	---	*[087_EDM_20_00_P.pdf] [0.6]*
EDM 21.30, Change Impact Analysis*	X	---	*[088_EDM_21_30_P.pdf] [0.6]*
EDM 24.00, Software Configuration and Change Control*	X	---	*[089_EDM_24_00_P.pdf] [0.5]*
EDM 74.00, Nuclear Qualification of Triconex Products*	X	---	*[090_EDM_74_00_P.pdf] [0.7]*
EDM 76.00, Dedication of Products for Nuclear Service*	X	---	*[091_EDM_76_00_P.pdf] [0.6]*
EDM 90.00, Product Verification*	X	---	*[092_EDM_90_00_P.pdf] [0.6]*
EDM 90.10, Product Validation (New since V9 SER)*	X	---	*[093_EDM_90_10_P.pdf] [0.6]*
EDM 90.30, Control of Tools and Test Software*	X	---	*[094_EDM_90_30_P.pdf] [0.6]*
9100055-001, Nuclear Dedicated Parts List*	X	---	*[095_NDPL_P.pdf] [0.8]*
9100055-103, DPE-03*	X	---	*[096_DPE03_P.pdf] [0.8]*
9100055-105, DPE-05*	X	---	*[097_DPE05_P.pdf] [0.4]*
9600164-534, System Accuracy Specifications	X	X	*[098_SysAccSpec.pdf] [1.2]*
9100112-001, Safety Concepts*	X	---	*[099_SafetyConcepts_P.pdf] [1.9]*
9100042-002, NGIO System Architecture Specification*	X	---	*[100_NGIOSysArch_P.pdf] [1.4]*
6200152-002, TCM System Architecture Specification*	X	---	*[101_TCMSysArch_P.pdf] [1.0]*
6200106-001, ETSX Software Architecture Specification*	X	---	*[102_ETSXSArch_P.pdf] [1.0]*
9100113-001, Safety Requirements*	X	---	*[103_SafetyReqmts_P.pdf] [0.6]*
7100222-001, Tricon Main Processor Hardware Design Spec*	X	---	*[104_MPHWDesSpec_P.pdf] [3.9]*
9100042-001, NGIO System Requirements Specification*	X	---	*[105_NGIOSysReq_P.pdf] [0.7]*
6200152-001, TCM System Requirements Specification*	X	---	*[106_TCMSysReq_P.pdf] [0.8]*
6200156-001, NGIO Core Software Architecture and Des Spec*	X	---	*[107_NGIOCoreArch_P.pdf] [1.0]*
6200152-004, TCOM Software Design Specification*	X	---	*[108_TCOMSWDes_P.pdf] [1.9]*
9100046-001, NGIO EPP, Engineering Project Plan*	X	---	*[109_NGIOEPP_P.pdf] [0.7]*
6200155-001, NGIO Core Software Reqmts Specification*	X	---	*[110_NGIOCoreSRS _P.pdf] [0.9]*
6200152-003, TCOM Software Requirements Specification*	X	---	*[111_TCOMSRS_P.pdf] [0.7]*
6200033-001, TriStation 1131 Software Requirements Spec*	X	---	*[112_TS1131SRS1_P.pdf] [1.0]*
6200033-002, TriStation 1131 V4.1 Software Reqmts Spec*	X	---	*[113_TS1131SRS2 _P.pdf] [0.4]*
9100098-001, NGIO Core H/W Requirements Specification*	X	---	*[114_NGIOCoreHRS_P.pdf] [0.6]*
9100098-002, NGIO Core H/W Design Specification*	X	---	*[115_NGIOCoreHDS_P.pdf] [0.9]*
6200159-001, NGIO Core Software Test Plan*	X	---	*[116_NGIOCoreSTP_P.pdf] [0.5]*
6500155-000, TCM Software Test Plan*	X	---	*[117_TCMSTP_P.pdf] [0.5]*
TCM A Traceability Report.doc*	X	---	*[118_TCMATrace_P.pdf] [0.9]*
Traceability Matrix NGIO CORE SYRS to NGIORVP.doc*	X	---	*[119_NGIOCoreTrace_P.pdf] [0.6]*
Traceability Matrix NGAI SYRS to NGAIRVP.doc*	X	---	*[120_NGAISysTrace_P.pdf] [0.5]*

Traceability Matrix NGDO SYRS to NGDORVP.doc*	X	---	*[121_NGDOSysTrace_P.pdf] [0.5]*
9600127-004, System Test Procedure*	X	---	*[122_SysTestProc004_P.pdf] [9.2]*
9600158-002, Tricon V10.1 Sys Functional Validation Proc*	X	---	*[123_10_1SysValProc_P.pdf] [0.9]*
9600038-001, Tricon V9+ I/O Modules Functional Val Proc*	X	---	*[124_V9_IOValProc _P.pdf] [1.1]*
6500106-003, Enh Tricon Sys Executive Software Test Descr*	X	---	*[125_SysExecSTD_P.pdf] [12.5]*
6200157-001, NGIO Core Software Test Description*	X	---	*[126_NGIOSTD_P.pdf] [0.8]*
6500155-011, TCM TSAA Software Test Description*	X	---	*[127_TCM_TSAASTD_P.pdf] [0.8]*
V&V Final Report Tricon V10.2 and V10.2.1*	X	---	*[128_V&VRep_10_2_1_P.pdf] [8.9]*
SQA Validation Summary Report Tricon I/O 451-515, V9.X *	X	---	*[129_SQAValSummaryRep_P.pdf] [9.7]*
Tricon V10.1 Validation Report*	X	---	*[130_ValRep_10_1_P.pdf] [1.1]*
6200003-195, Tricon V10.2 Release - Software Release Def*	X	---	*[131_SRD_10_2_P.pdf] [0.7]*
6200003-196, Tricon V10.2.1 Release - Software Release Def*	X	---	*[132_SRD_10_2_1_P.pdf] [0.6]*
Dedication Package Example – 022210*	X	---	*[133_DedicationPkg_P.pdf] [1.1]*
<u>Enclosure 3: Revised Topical Report</u>			
Topical Report 7286-545-1, Rev 2	X	X	*[135_TR_Rev2.pdf] [1.5]*
Topical Report 7286-545-1, Rev 2, Appendix A, Comp Matrix	X	X	*[136_TR_Rev2_AppA.pdf] [0.8]*
Topical Report 7286-545-1, Rev 2, Appendix B, App Guide	X	X	*[137_TR_Rev2_AppB.pdf] [0.7]*

*) Document Contains Invensys Proprietary material
**) Non-proprietary version of Proprietary document (redacted)

Notes:
(a) CD#10 contains Proprietary Documents (among all files). CD#11 contains only Non-Proprietary Documents (Publicly Available).
(b) Non-Proprietary Versions of the Documents in Enclosure 2 are not provided due to their predominantly proprietary content.

AFFIDAVIT No. TCXNRC-10-01
Re: Request for Withholding from Public Disclosure per 10CFR2.390

STATE OF CALIFORNIA)
) ss
COUNTY OF ORANGE)

I, Michael Kieu, being duly sworn, hereby say and depose:

1. I am Director of Safety and Critical Control Development at Invensys, and as such I have been specifically delegated the function of reviewing company proprietary information sought to be withheld from public disclosure in connection with the nuclear safety related qualification of the TRICON Programmable Logic Controller (PLC) system and am authorized to apply for its withholding on behalf of Invensys.

2. The information sought to be withheld is contained in the document(s) described below:

   (See Attachment 1 listing of documents)

   Each of the indicated documents contains information considered to be proprietary. Proprietary material in the enclosed documents is indicated by brackets [ ] or other similar markings as required by 10CFR2.390(b)(1)(i)(B). Non-proprietary versions of selected documents (with specific proprietary parts removed) are also being provided, as indicated in the associated Transmittal letter.

   This information is a collection of key documents associated with ongoing upgrade and maintenance of qualification of the Tricon PLC. This will allow the NRC to verify compliance with current regulatory requirements in support an update to the SER for the Tricon PLC System and associated Triconex Topical Report 7286-545-1-A.

3. I am making this affidavit in conformance with the provisions of 10CFR Part 2.390 of the Commission's regulations and in conjunction with the Invensys Triconex application for withholding accompanying this Affidavit.

4. I have personal knowledge of the criteria and procedures utilized by Invensys in designating information as a trade secret, privileged, or as confidential commercial or financial information. Some examples of categories of information which fit into the definition of proprietary information are:

   a) Information which discloses process, method, or apparatus, including supporting data and analyses, where prevention of its use by Invensys Triconex's competitors without license or contract from Invensys constitutes a competitive economic advantage over other companies in the industry.
   b) Information, which if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product.

c) Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of Invensys, its customers, its partners, or its suppliers.
d) Information which reveals aspects of past, present, or future Invensys Triconex customer-funded development plans or programs, of potential commercial value to Invensys.
e) Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.
f) Information obtained through Invensys Triconex actions which could reveal additional insights into Nuclear safety related PLC equipment qualification processes and regulatory proceedings, and which are not otherwise readily obtainable by a competitor.

Information to be withheld is considered to be proprietary based on the reasons set forth in paragraphs 4 (a), (b), and (f) above.

5. These documents describe the details of a program to qualify Triconex equipment which has undergone nuclear qualification testing. Product design and development details are also represented. Invensys Triconex is the first manufacturer of a PLC to fully implement the requirements set forth in the EPRI TR-107330, which has been endorsed by the Commission in an SER. Invensys Triconex has expended a significant amount of money and effort involving numerous contractors over a 12 year time period to develop and implement an ongoing successful approach to its qualification and test program. Information developed relating to test plans, approaches, equipment, specific problems encountered, licensing perspectives, and lessons learned has significant value because of the resources expended to successfully accomplish this process and the usefulness of this knowledge to potential competitors.

   Specific test data showing compliance with requirements and demonstrating technical capability of the equipment has substantial commercial value because it provides the basis for qualifying Triconex equipment to be sold for safety-related digital upgrades to nuclear plants. Existing options for digital upgrades in the nuclear industry are limited. We believe that ongoing successful nuclear qualification upgrades of the Invensys Triconex products, already well known in non-nuclear applications, will continue to give Invensys a competitive advantage in this field.

   Disclosure of information in these documents would cause substantial harm to the competitive position of the Invensys, as there are other competing companies who wish to develop, qualify, and sell digital control systems for safety related application in nuclear power plants. Competing firms could use our experience, successful approaches, and technical information to facilitate their own equipment qualification efforts and/or product design without compensating Invensys.

6. Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
   (i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Invensys.
   (ii) The information is of a type customarily held in confidence by Invensys and not customarily disclosed to the public. Invensys has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Invensys policy and provide the rational basis required.
   (iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10CFR Part 2.390, it is to be received in confidence by the Commission.
   (iv) This information is not readily available in public sources.

(v) Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Invensys, because it would enhance the ability of competitors to provide similar design of PLC or qualify similar equipment using similar project methods, equipment, testing approach, contractors, or licensing approaches. As described in section 5, this information is the result of considerable expense to Invensys and has great value in that it will assist Invensys in providing Triconex digital upgrade equipment and services to a new, expanding markets not currently served by the company.

7. The foregoing statements are true and correct to the best of my knowledge, information, and belief.

Michael Kieu
Director, Safety and Critical Control Development
Invensys

Sworn to and subscribed before me

this 1 day of April, 2010

Notary Public

State of California
County of Orange
Subscribed and sworn to (or affirmed) before me
on this 1 day of April, 2010
by V. Matheson,
proved to me on the basis of satisfactory evidence
to be the person(s) who appeared before me.
Signature (Seal)

V. MATHESON
COMM. # 1862131
NOTARY PUBLIC-CALIFORNIA
ORANGE COUNTY
My Comm. Expires AUG 21, 2013

Attachment 1: Listing of Proprietary Documents Covered by this Affidavit

(1) *MDM 12.1, Production Order Tag Report*
(2) *QPM 2.1, Quality Planning*
(3) *QPM 13.2, Product Discrepancies*
(4) *EDM 11.03, Process and Product Quality Assurance*
(5) *EDM 12.00, Product Development Process*
(6) *EDM 12.10, Project Planning*
(7) *EDM 12.50, Requirements Management*
(8) *EDM 20.00, Configuration Management*
(9) *EDM 21.30, Change Impact Analysis*
(10) *EDM 24.00, Software Configuration and Change Control*
(11) *EDM 74.00, Nuclear Qualification of Triconex Products*
(12) *EDM 76.00, Dedication of Products for Nuclear Service*
(13) *EDM 90.00, Product Verification*
(14) *EDM 90.10, Product Validation (New since V9 SER)*
(15) *EDM 90.30, Control of Tools and Test Software*
(16) *9100055-001, Nuclear Dedicated Parts List*
(17) *9100055-103, DPE-03*
(18) *9100055-105, DPE-05*
(19) *9100112-001, Safety Concepts*
(20) *9100042-002, NGIO System Architecture Specification*
(21) *6200152-002, TCM System Architecture Specification*
(22) *6200106-001, ETSX Software Architecture Specification*
(23) *9100113-001, Safety Requirements*
(24) *7100222-001, Tricon Main Processor Hardware Design Spec*
(25) *9100042-001, NGIO System Requirements Specification*
(26) *6200152-001, TCM System Requirements Specification*
(27) *6200156-001, NGIO Core Software Architecture and Des Spec*
(28) *6200152-004, TCOM Software Design Specification*
(29) *9100046-001, NGIO EPP, Engineering Project Plan*
(30) *6200155-001, NGIO Core Software Reqmts Specification*
(31) *6200152-003, TCOM Software Requirements Specification*
(32) *6200033-001, TriStation 1131 Software Requirements Spec*
(33) *6200033-002, TriStation 1131 V4.1 Software Reqmts Spec*
(34) *9100098-001, NGIO Core H/W Requirements Specification*
(35) *9100098-002, NGIO Core H/W Design Specification*
(36) *6200159-001, NGIO Core Software Test Plan*
(37) *6500155-000, TCM Software Test Plan*
(38) *TCM A Traceability Report.doc*
(39) *Traceability Matrix NGIO CORE SYRS to NGIORVP.doc*
(40) *Traceability Matrix NGAI SYRS to NGAIRVP.doc*
(41) *Traceability Matrix NGDO SYRS to NGDORVP.doc*
(42) *9600127-004, System Test Procedure*
(43) *9600158-002, Tricon V10.1 Sys Functional Validation Proc*
(44) *9600038-001, Tricon V9+ I/O Modules Functional Val Proc*
(45) *6500106-003, Enh Tricon Sys Executive Software Test Descr*
(46) *6200157-001, NGIO Core Software Test Description*
(47) *6500155-011, TCM TSAA Software Test Description*
(48) *V&V Final Report Tricon V10.2 and V10.2.1*
(49) *SQA Validation Summary Report Tricon I/O 451-515, V9.X*
(50) *Tricon V10.1 Validation Report*
(51) *6200003-195, Tricon V10.2 Release - Software Release Def*
(52) *6200003-196, Tricon V10.2.1 Release - Software Release Def*
(53) *Dedication Package Example – 022210*

[Refer to associated Transmittal Letter for further document information]