April 4, 2007

MEMORANDUM TO: W. E. Kemper, Chief
Instrumentation and Electrical Engineering Branch
Division of Engineering, Fuel, and Radiological Research
Office of Nuclear Regulatory Research

FROM: Gabriel Taylor, NSPDP General Engineer /**RA/**
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF TASK WORKING GROUP MEETING WITH THE NUCLEAR REGULATORY COMMISSION AND NUCLEAR INDUSTRY CONCERNING HIGHLY INTEGRATED CONTROL ROOM – COMMUNICATION ISSUES

On March 29, 2007, the Nuclear Regulatory Commission (NRC) staff met with the Nuclear Energy Institute (NEI) and other nuclear industry shareholders as a Task Working Group (TWG) on Highly Integrated Control Room (HICR) – Communications to communicate progress on follow-up actions identified during previous meetings and discuss Video Display Unit (VDU) design concepts. The meeting took place at NRC headquarters located in Rockville, MD. Attachment 1 lists the meeting attendees.

A public meeting notice was issued on March 14, 2007, and was posted on the NRC's external (public) web page (Agencywide Document Access Management System (ADAMS) Accession No. ML070740279, Attachment 2). The notice included the meeting agenda, which was also available as a handout at the meeting. The discussions included; (1) review and prioritization of communication design concepts, (2) inter-channel communication design concepts, (3) VDU design concepts and (4) summarization of actions items and future meeting agenda items.

The meeting started with a quick update by Bill Kemper on the progress and changes that were made by the Digital I&C Steering Committee since the last HICR – Communications TWG meeting on March 8, 2007. A modified project plan that the TWG had been working on in past meetings was approved by the Digital I&C Steering Committee and is attached to this meeting summary (Attachment 4). This approved project plan differs from the project plan that the TWG finalized during its March 8, 2007 meeting, in that several sections will be moved to the overall Digital I&C Project Plan, and some information will no be included. The March 8, 2007 TWG project plan will be retained as a working document for the TWG to use as appropriate (Attachment 5).

Review and Prioritization of Communication Design Concepts

As a follow up action from the March 8, 2007 public meeting, the industry contacts presented a listing of digital I&C communication design priorities that each vendor had identified as important to develop regulatory guidance to license its design. The TWG reviewed this listing and found that several of the issues each vendor indicated overlap one another. As such, the TWG

compiled all of the individual vendor design concept priorities into a single listing (This listing is attached to this meeting summary, Attachment 3). The industry contacts did not identify any items having a higher priority than others and as such the listing places the same high priority on all items. Completion of these activities completed the two milestones in the HICR – Communications Project Plan to: (1) identify communication design concepts and (2) final prioritization of communication design concepts.

Inter-Channel Communication Design Concept Presentation

Joe Murray from Invensys Process Systems presented the TWG with the Tricon system communication design. The purpose of this presentation was to learn the design concepts that one particular vendor used so that the TWG could compare the particular design against guidance being developed to identify areas where the guidance can be improved or if additional guidance needs to be developed to meet the design concepts that various vendors may want to licensee in the near future for new reactors, operating reactors, and/or fuel cycle facilities. (Invensys presentation slides are attached to this meeting summary, Attachment 6)

Mr. Murrays' presentation was broken into two segments, (1) hardware based isolation and independence and (2) software based message validation methodology. The hardware based isolation and independence discussion showed how interdivision, peer-to-peer, safety to non-safety, and cross divisional communications were designed for the Tricon system.[1] The software based message validation methodology presented how the Tricon system maintains data integrity, which is an essential part of ensuring proper inter-channel communications. Mr. Murray presented the credible failures for the Tricon system and then showed the remedial measure which the system incorporated into its design to prevent these failures.

Video Display Unit Design Concepts

Ken Scarola from Mitsubishi Heavy Industries (MHI) provided the TWG with a presentation on VDU design concepts. (This presentation was provided as a handout during the meeting, Attachment 7). Mr. Scarolas' presentation provided the TWG with an understanding of the purpose, benefits and implementation concepts for multi-channel non-safety VDUs to facilitate better TWG communication during the development of related guidance. Mr. Scarola provided the TWG with a lot of information that the TWG plans to review and use to develop regulatory guidance.

Action Item Summary & Future Meeting Agenda Items for HICR – Communications TWG

Three item actions were identified during this meeting, as follows

Item #	Description of Action Item	Responsibility
1	Confer with NRC HICR-HF TWG members on the use of non-safety VDUs to control reactor operations during all plant conditions when available. Is this an appropriate decision from the human factors point of view?	NRC

[1] No proprietary information was disclosed during this meeting.

Item #	Description of Action Item	Responsibility
2	Provide feedback from Invensys and other vendors to the TWG on draft revisions to IEEE 7-4.3.2, on credible failures as it relates to communication independence.	NEI
3	Work through NRC project manager (Paul Rebstock) to provide ORNL with information from other countries guidance and use of inter-channel communications and VDU design concepts.	NEI

The next HICR – Communications TWG meeting will be April 24, 2007, and the tentative subject matter for this meeting will be to follow-up on the actions items listed directly above, continue discussions on VDU design concepts, and begin discussions on priority module design concepts.

Attachments:
1. Meeting Attendees
2. Meeting Notice
3. High Priority Issues for Digital I&C HICRc
4. S.C. Approved HICR – Communications Project Plan
5. HICR – Communication Working Document
6. Invensys presentation slides (ADAMS Accession No. ML070930390)
7. MHI presentation handout (ADAMS Accession No. ML070930405)

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ADAMS ACCESSION NO. ML

OFFICE	NRR/EICB/NSPDP	RES/IEEEB/BC
NAME	GTaylor	WKemper
DATE	4 / 4 / 2007	4 / 4 / 2007

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DISTRIBUTION FOR MEETING SUMMARY:

Dated: March 29, 2007

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GShukla

External E-mail
kah@nei.org
kak@nei.org

LIST OF ATTENDEES

MEETING REGARDING TASK WORKING GROUP ON

HIGHLY INTEGRATED CONTROL ROOM – COMMUNICATION ISSUES

THURSDAY, MARCH 29, 2007

NAME	ORGANIZATION
G. Taylor	NRC/NRR
R. Beacom	NRC/NRO
G. Singh	NRC/NRR
R. Kisner	ORNL
S. Small	Areva NP
J. Shook	Areva NP
R. Wood	ORNL
W. Bowers	Exelon
K. Scarola	NAE-MNES
S. Hanada	MNES
K. Keithline	NEI
P. Rebstock	NRC/RES
W. Kemper	NRC/RES
E. Coffman	NRC/NRO
T. Hayes	Westinghouse
R. Jarrett	TVA
J. Murray	Invensys
R. Stattel	GE
M. Gibson	Progress Energy
M. Gasparovic	Westinghouse
D. Herrell	MPR Assoc.
W. Smith	NRC/NMSS

JOINING MEETING VIA TELECONFERENCE BRIDGE LINE

NAME	ORGANIZATION
D. Chase	Scientech
D. Blanchard	AREI

NRC = Nuclear Regulatory Commission
NRR = Office of Nuclear Reactor Regulation
NRO = Office of New Reactors
NMSS = Nuclear Material Safety and Safeguards
RES = Office of Nuclear Regulatory Research
NEI = Nuclear Energy Institute
TVA = Tennessee Valley Authority
ORNL = Oak Ridge National Labs

ATTACHMENT 1

March 14, 2007

MEMORANDUM TO: William Kemper, Chief
Instrumentation and Electrical Engineering Branch
Division of Fuel, Engineering, and Radiological Research
Office of Nuclear Regulatory Research

FROM: Gabriel J. Taylor, Project Manager **/RA/**
Instrumentation and Controls Branch
Division of Engineering
Office of Nuclear Reactor Regulation

SUBJECT: PUBLIC MEETING WITH THE NUCLEAR ENERGY INSTITUTE (NEI) AND NUCLEAR POWER INDUSTRIES REGARDING HIGHLY-INTEGRATED CONTROL ROOM - COMMUNICATION ISSUES (TASK WORKING GROUP)

DATE, TIME: Thursday, March 29, 2007
9:00am – 4:00pm

LOCATION: U.S. Nuclear Regulatory Commission
Two White Flint North
11555 Rockville Pike, Room T-7A1
Rockville, Maryland 20852

PURPOSE: NRC staff and industry representatives will discuss current Digital I&C issues in the area of highly integrated control room – communications.

CATEGORY 2:* This is a Category 2 Meeting. The public is invited to participate in this meeting by discussing regulatory issues with the NRC at designated points identified on the agenda.

PARTCIPANTS: Refer To Enclosure For A List of Participants

Project No. 689

Enclosure: Agenda

CONTACT: Gabriel J. Taylor, NRR
GJT@NRC.GOV 301-415-3166

* Commission's Policy Statement on "Enhancing Public Participation in NRC Meetings," 67 *Federal Register* 36920, May 28, 2002

ATTACHMENT 2

AGENDA FOR MARCH 29, 2007 PUBLIC MEETING

BETWEEN NUCLEAR POWER INDUSTRIES AND

THE U.S. NUCLEAR REGULATORY COMMISSSION REGARDING

HIGHLY INTEGRATED CONTROL ROOM – COMMUNICATIONS

Time (approx)	**Topic**	**Lead**
9:00	Introductory Remarks	NRC
9:15	Review Objective of Meeting	NRC/NEI
9:30	Follow-Up of Action Items from Previous Meetings • Review of Communication Design Concepts • Prioritization of Communication Design Concepts	ALL
11:00	Discussion of Video Display Unit (VDU) Design Concepts	ALL
12:00	Lunch	
12:45	Continue Discussion of VDU Design Concepts	ALL
3:15	Summarize Action Items	ALL
3:30	Planning for Next Meeting	ALL
3:50	Public Questions and Comments	NRC
4:00	Closing and Adjournment	NRC

Participants:

NRC	NEI
William Kemper	Kimberly Keithline
Paul Rebstock	Wes Bowers
Gursharan Singh	Ron Jarrett
Royce Beacom	

ENCLOSURE
ATTACHMENT 2

High priority issues for Digital I&C HICRc

(***all have same priority assuming draft RIS is available September 2007***)

1. Communication between safety divisions.
   - Functional Independence
   - Message Integrity

2. Control of both safety and non-safety components from a non-safety workstation (VDU)
   - via Non-safety function computer and priority module, or directly from a non-safety HMI to a safety function computer
   - component or group control

3. Human-Machine Interface (HMI) to multiple divisions of safety digital systems (Safety and Non-safety HMI)

4. Operating a reactor using information displayed on a non-safety VDU for all plant conditions

5. Requirements for priority modules

6. Safety HMI control of non-safety components

7. Design requirements (e.g., Quality and Qualification) for Non-Safety devices involved in inter-channel communication
   - Non-safety VDU
   - Shared sensors

8. Communication involving diverse non-safety systems

9. Safety Communication Protocols
   - Profibus between safety divisions
   - Ethernet between digital safety systems and safety HMI

HIGHLY INTEGRATED CONTROL ROOM-COMMUNICATIONS ISSUES PROJECT PLAN

1 BACKGROUND

The Highly Integrated Control Room-Communications Issues (HICRc) Task Working Group (TWG) will address HICR design issues related to communications involving digital equipment in nuclear safety service. This action is needed to support development of the design and procurement specification for simulators for new plants and for the design and implementation of digital retrofits at existing plants. Specifically, this TWG will address all communication design provisions between safety divisions[2], and between safety and non safety divisions. In this context, "communication" means any transmittal or reception of data, information, or commands.

There are clear potential advantages to the implementation of some types of cross-divisional communication within digital systems. However, preservation of adequate independence for digital systems communications is essential. The objective of this task working group is to evaluate cross-divisional communication interactions and to clarify design and licensing criteria by which beneficial interactions may be accomplished while maintaining adequate safety margin.

2 SCOPE

The following types of communication interactions will be addressed by the TWG:

1. Communication among redundant electrical divisions
2. Communication between any safety division and anything external to that division
3. Control of safety equipment in multiple divisions from a single workstation
4. Control of safety equipment from a nonsafety workstation
5. Commingling of safety and nonsafety controls or indications on a single workstation
6. Connection of nonsafety programming, maintenance, and test equipment to redundant safety divisions during operation

The following are explicitly excluded from the scope of this task:

1. Communication within a single safety division
2. Communications which do not involve a safety channel

Cyber-Security, Diversity and Defense-in-Depth, and Human Factors (HF) considerations are all closely related to the general concept of cross-divisional communications. However, these issues are being addressed by other TWGs. Therefore coordination with each associated TWG

[2] The terms "channel" and "division" are used herein in accordance with the definitions of those terms in IEEE 603-1991.

will be necessary to ensure that HICRc TWG activities are consistent with, and supportive of, the solutions that they will provide.

Except as specifically addressed in the resolution of the issues identified above, physical separation and electrical isolation requirements for digital equipment are the same as for non-digital equipment. Physical separation and electrical isolation will not be addressed separately in this task. Similarly, seismic and environmental qualification requirements are not included in this task.

3 PROBLEM STATEMENT

Industry and NRC guidance documents, listed below, do not define at a sufficient level of detail the expectation for inter-divisional communications independence.

- Industry Standards (e.g. IEEE 7-4.3.2-2003, "IEEE Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations") do not provide sufficient guidance for inter-divisional communications independence within digital systems.
- NRC Regulatory guidance (e.g. Regulatory Guide 1.152, "Criteria for Digital Computers in Safety Systems of Nuclear Power Plants") do not provide explicit guidance for inter-divisional communications independence within digital systems.
- The protection system division separation and isolation requirements in existing regulations (10CFR50.55a (h),"Protection and Safety Systems," which incorporates IEEE603-1991, "Criteria for Safety Systems for Nuclear Power Generating Stations," among other things) do not define for digital systems "the degree [of independence] necessary to retain the capability to accomplish the safety function during and following any design basis event requiring that safety function."
- Standard Review Plan Chapter 7 includes conflicting guidance regarding communication independence.

4 DELIVERABLES

1. Issue interim guidance that will document an acceptable degree of communications independence for digital systems.
2. Facilitate a revision to IEEE 7-4.3.2.
3. Revise Regulatory Guide 1.152.
4. Update Standard Review Plan to provide acceptable regulatory and licensing criteria for communications independence of digital systems.

5 MILESTONES, ASSIGNMENTS, AND DELIVERABLES

Milestones and Deliverables	deliverable	Due Date (2007 or as-noted) Fcst / Actual	Lead	Support
Near-Term				
Initial TWG meeting			NRC	NEI
Statement of fundamental restrictions & requirements - draft			NRC	NEI
Statement of fundamental restrictions & requirements - final			NRC	NEI
Identify communication design concepts			NEI	NRC
Final prioritization of communication design concepts[3]			NEI	NRC
NRC RES Project results available (not final report)			NRC	n/a
Develop regulatory & design guidance with basis for each type of interaction			NRC	NEI
Develop guidance outline & acceptance criteria			NRC	NEI
Industry review & comment on guidance outline & acceptance criteria			NEI	n/a
Develop initial draft of guidance recommendations			NRC	NEI
Final draft of guidance recommendations submitted for use in developing draft interim guidance			NRC	n/a
Develop draft interim guidance			NRC	n/a
Issue the approved interim guidance	✓		NRC	n/a
Long-Term				
Work with IEEE on modifications to 7-4.3.2 – anticipate issue by:	✓		NEI	n/a
Revise RG 1.152	✓		NRC	n/a
Revise SRP	✓		NRC	n/a

[3] Completion of this milestone will provide industry input to the scope of communications design concepts that will be addressed by the TWG.

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will be necessary to ensure that HICRc TWG activities are consistent with, and supportive of, the solutions that they will provide.

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- Standard Review Plan Chapter 7 includes conflicting guidance regarding communication independence.

4 GOALS & CRITERIA FOR SUCCESS

The goal of this TWG is to:

1. Establish criteria permitting a safety channel to accept information and commands from sources outside its electrical safety division while retaining separation, isolation, and functional independence in accordance with existing requirements.
2. Develop a document describing the design and licensing guidance needed to implement the criteria developed in goal #1.
3. Assess need for alteration of existing regulations. Include consideration of timing issues relative to anticipated licensing submittals vs. time required to accomplish the recommended rulemaking.
4. Produce recommendations for alteration of existing regulatory guidance, if appropriate, for clarification of particular provisions applicable to digital systems.

5. Prepare recommendations for one or more Regulatory Information Summaries (RIS) (or other vehicle as designated by the Digital I&C Steering Committee (DI&CSC)) to disseminate and facilitate the implementation of the TWG recommendations, as approved by the DI&CSC.
6. Make recommendations for modification of industry standards as needed.

The TWG will consider the possibility that the needs of new and existing facilities are different, and will include accommodation of such differences in the final documentation if necessary. It is initially anticipated that there will be no difference in the guidance for new and existing facilities.

Final guidance relating to control room design is needed to support final specification and design of the simulators for new plants. It is anticipated that the first simulators will need to be ordered in mid-2009, and that about 18 months will be required between the time the guidance is issued and the first simulators are ordered. The guidance is therefore needed by early 2008. To allow for a reasonable amount of schedule float, the TWG anticipates completing its work by mid-2007.

It is noted that support of simulator procurement requires only that the conceptual design of the control room be completed. It does not require that the details of the internal workings of the operator interfaces be fully developed. The efforts of this TWG will influence the nature and layout of the control room in that requirements relating to the disposition and application of operator interface workstations could be affected, but those influences will be limited to whether various operator-interface design provisions will or will not be considered acceptable (for example, whether or under what design constraints it might be acceptable for a single control station to include both safety and nonsafety functions). The efforts of other TWG will have greater influence upon control room design and layout, such as the TWG working on Diversity and Defense-in-Depth (D3) requirements, and the TWG working on details of Human-Machine Interfaces (HMI) from a Human Factors (HF) standpoint.

The HICRc TWG will focus on issues related to the technical aspects of communications. It will not specifically address the application of such communications provisions in regard to D3 or HF considerations, and will not specifically address cyber-security concerns. HICRc TWG will interact with the TWG that are addressing those issues.

In the near term (defined as in support of simulator procurement for the first of the anticipated new plants), the TWG will produce recommendations for guidelines describing appropriate design provisions and limitations. These guidelines will include a statement of the fundamental requirements and specific regulatory criteria that must be observed. The HICRc TWG will also provide recommendations for revisions to RG1.152, IEEE 7-4.3.2, applicable Standard Review plan sections, and other regulatory guidance and industry standards as deemed necessary.

These recommendations will be considered “long-term” and will be addressed by the NRC independently of the TWG and probably at a time following the disbandment of the TWG.
The TWG will give due consideration to the burdens (e.g., costs, labor) that might be imposed upon both applicants and NRC staff as a result of specific guidance. For example, acceptance of a certain provision might require detailed staff review in an area not presently subject to such review. This would impose a burden upon an applicant in that additional materials must be assembled for inclusion in the application package, some of which may be proprietary and thus require the development of a redacted version as well as the full version, and upon the NRC in the actual review of the subject details. The cost of such a provision in terms of resources,

review effort, and review time extension should be considered in relation to the potential benefits of such an approach relative to an approach that is simpler from a regulatory point of view.

In addition, it is anticipated that the TWG will make all reasonable efforts to provide guidance that will not involve significant changes in NRC policy and will not require rulemaking. It is anticipated that industry objectives can be met within the existing regulations.

4.1 Critical Path and Steps to Success

In order to accomplish its mission, the HICRc TWG will need to have timely access to detailed information concerning each proposed reactor design. The TWG will make every reasonable effort to obtain specific design information needed to support its work. However, if extended correspondence with reactor vendors is required in an effort to obtain the needed information, or if information availability is restricted by intellectual property rights issues or other issues, the TWG may recommend deferral of review of the respective vendor design details until such design details are made available, or recommend other compensatory action to the NRC Digital I&C Steering Committee. In such a case, the TWG would proceed on the basis of generic considerations. The NRC Digital I&C Steering Committee should be advised promptly if such a situation occurs.

The primary efforts of the TWG will include the following:

1. Develop a statement describing the existing regulatory requirements and regulatory guidance associated with cross-divisional interactions, without consideration of specific proposed designs. This statement will establish the recommended boundaries for the ultimate products of the HICRc TWG.
2. Develop a detailed and prioritized listing of the types of interactions to be considered by the TWG. The TWG will address the associated design and licensing issues in accordance with this prioritization. To support the development and prioritization of this listing, the industry members will advise the TWG as a whole as to their best estimate of the types of cross-channel interactions that have actually been proposed or planned, with indication of the level of interest in the use of each type. The industry members may obtain this information through informal polling of selected vendors and facilities, or by whatever means they determine to be appropriate. Consideration should include new plants, existing plants, and fuel cycle facilities. The objective of this advice is to ensure that the TWG addresses the types of interactions that are of greatest interest to industry. For example, perhaps many system designers plan to use scratchpad-based data exchange and some but very few plan to use Ethernet-based direct communication between safety processors: then the TWG would address the more widespread practice first and the less widespread practice later. If it determines that some type of interaction is planned for use by only a very few suppliers but that that type of interaction is highly desirable or problematical, the TWG may choose to address that issue early in order to get the word out that that type of interaction may be easy or difficult to license.[5] The industry member advice should consider such issues as, for example:

[5] This prioritization will not preclude or affect NRC consideration of interactions proposed in license requests that have already been submitted or that are submitted in the future. License requests that fall outside the recommendations of the TWG or that are contrary to them will be considered by the NRC on a case-by-case basis.

- sharing a control station associated with one safety division by other safety or non-safety divisions
- provision of hard controls and indicators (physical switches, indicating lights, analog indicators, etc.) on computer-based control consoles or on panels dedicated to the support of manual actuations
- use of, and licensing credit taken for, manual actuation systems
- intended flow of data and commands into and out of each safety division from external sources
- commingling of safety and non-safety functions or processes in a single processor or software package, and commingling of safety functions from different divisions

3. Identify consensus standards applicable to this issue.
4. Develop recommendations for licensing guidance and associated bases for each specific type of interaction that is included in the TWG scope of consideration.
5. Provide recommendations for one or more RIS (or other vehicle as directed by the NRC Digital I&C Steering Committee) for approval by the NRC DI&CSC to document the regulatory and design guidance for communications independence of digital systems. The recommendations should include specific acceptance criteria for types of interactions found to be acceptable, and is also to include descriptions of types of interactions found to be unacceptable.

5 REFERENCES

1. NEI whitepaper
   - comments by Invensys
   - comments by Mike Waterman
   - comments by Gary Johnson (via HL Dec11)
2. RG 1.152
3. SRP7.1-D
   - latest draft
   - comments by NEI (Feb7)
   - comments by Wes Bowers
   - also consider associated SRP sections
4. IEEE 7-4.3.2
   - draft from late January IEEE meeting
5. IEEE 603
6. Public meetings concerning HICRc (NRC slides, NEI slides, action items list as applicable)
   - Dec 12, 2006
   - Feb 2, 2007 (HICRc portion only)
   - Feb 23, 2007
   - March 8, 2007
   - March 29, 2007
   - April 24, 2007
   - May 15, 2007
   - June 5, 2007
   - June 28, 2007
   -

6 TASK WORKING GROUP (TWG) MEMBERSHIP

NRC representatives:

William Kemper	(RES, TWG manager)
Paul Rebstock	(RES, TWG technical lead)
Gush Singh	(NRR)
Royce Beacom	(NRO)
Will Smith	(NMSS)

Industry representatives:

Wes Bowers	(Exelon)
Ron Jarrett	(TVA)
Kimberly Keithline	(NEI)

7 RESPONSIBILITIES AND MILESTONES

7.1 NRC Representatives

The NRC representatives are responsible for the development of this Project Plan.
The NRC representatives will draft all TWG deliverables except as explicitly agreed by the TWG as a whole.

7.2 Industry Representatives

The industry representatives are responsible for providing information to the NRC as to:

- whether the scope of this TWG and the activities described in the draft Project Plan address all of the industry concerns relating to safety system communications that must be addressed to support ordering new plant simulators by mid 2009
- whether the deliverables described in the draft Project Plan will support an efficient regulatory process
- whether the schedule expressed in the draft Project Plan and the industry schedules for associated activities are compatible with one another

In addition, it is the responsibility of the industry representatives to interact as necessary with reactor vendors and others to obtain design information needed to support the work of the TWG as described herein

The industry representatives are invited to provide comment and discussion concerning the items within the purview of this TWG, and to offer comments and other input on all TWG deliverables, in the interest of ensuring that industry's needs are appropriately addressed.

7.3 Milestones, Assignments, and Deliverables

Milestones and Deliverables	deliverable	Due Date (2007 or as-noted)	F<u>cst</u> / <u>A</u>ctual	Lead	Support
Near-Term					
Initial TWG meeting		*Feb 23*	A	NRC	NEI
Statement of fundamental restrictions & requirements - draft	✓	*March 8*	A	NRC	NEI
Statement of fundamental restrictions & requirements - final	✓	*March 8*	A	NRC	NEI
Submit final draft of HICRc Project Plan for integration into DI&C plan	✓	*March 16*	A	NRC	NEI
DI&C-SC endorsement of HICRc Project Plan			F	NA	n/a
Identify communication design concepts		*March 22*	F	NEI	NRC
Final prioritization of communication design concepts	✓	*March 29*	F	NEI	NRC
NRC RES Project results available (not final report)		*June 1*	F	NRC	n/a
Develop regulatory & design requirements with basis for each type of interaction	✓	*June 1*	F	NRC	NEI
Develop guidance outline & acceptance criteria	✓	*June 15*	F	NRC	NEI
Document basis for rule change recommendations	✓	*June 15*	F	NRC	NEI
Industry review & comment on guidance outline & acceptance criteria	✓	*June 22*		NEI	n/a
Develop initial draft of guidance recommendations	✓	*June 29*	F	NRC	NEI
Final draft of guidance recommendations submitted for use in developing draft Regulatory Information Summary	✓	*July 31*	F	NRC	n/a
Develop draft Regulatory Information Summary(s)	✓	*Sept 7*	F	NRC	n/a
DI&C-SC endorses draft Regulatory Information Summary(s)	✓	*Sept 14*	F	NRC	NEI
Issue the approved Regulatory Information Summary(s)	✓	*Sept 28 (tentative projection)*	F	NRC	n/a
Long-Term					
work with IEEE on modifications to 7-4.3.2 – anticipate issue by:				NEI	n/a
revise RG 1.152				NRC	n/a
revise SRP				NRC	n/a