IHE-RO Technical Committee
Face-to-Face Meeting
Mountain View, CA
January 24-28, 2011

Technical Committee Chairs:
Bruce Curran, MS, ME
Stuart Swerdloff, PhD

IHERO Task Force Co-Chairs
Jatinder Palta, Ph.D.
Prabhakar Tripuraneni, M.D., F.A.C.R., F.A.S.T.R.O.

Mission Statement: *The American Society for Radiology Oncology (ASTRO) has formed a multi-society Task Force to undertake an initiative to promote the Integration of the Healthcare Enterprise (IHE) – Radiation Oncology (RO), fostering seamless connectivity and integration of radiotherapy equipment and the patient health information systems. The Task Force will include members from ASTRO, RSNA, American Association of Physicists in Medicine (AAPM), the American College of Radiology (ACR) and the Medical Imaging and Technology Alliance (MITA). In addition, members of the International community have also been invited to participate in IHE-RO. The IHE-RO Task Force, in close collaboration with radiotherapy product manufacturers, will develop appropriate integration profiles for radiation therapy and setup a demonstration of seamless communication among the full array of radiotherapy products.*

Attendance X = in person, W = via Webex

Name	Company	Email	1/24	1/25	1/26	1/27	1/28
Bruce Curran	RI Hosp./ASTRO	bcurran1@lifespan.org	X	X	X	X	X
Stuart Swerdloff	Elekta	stuart.swerdloff@elekta.com	X	X	X	X	X
Walter Bosch	Wash. Univ./ATC	bosch@wustl.edu	X	X	X	X	X
	U. Florida	rkapoor@ufl.edu	X	X	X	X	X
Chris Pauer	Tomotherapy	cpauer@tomotherapy.com	X	X	X	X	X
Sue Reilly	Elekta	sue.reilly@elekta.com	X	X	X	X	X
Harold Beunk	Nucletron	harold.beunk@nl.nucletron.com	X	X	X	X	X
David Wikler	IBA	david.wikler@iba_group.com	X	X	X	X	X
Olivier Vierlinck	IBA	Olivier.vierlinck@iba-group.com	X	X	X	X	X
Eli Stevens	Mobius Medical	elis@doselab.com	X	X	X	X	X
Sam Brain	Stanford Univ.	samb@stanford.edu	X	X	X	X	X
Norman Trapp	Siemens	Norman.Trapp@siemens.com	X	X	X	X	X
Koua Yang	Philips	koua.yang@philips.com	X	X	X	X	X
Sanjay Bari	Elekta	sanjay.bari@elekta.com	X	W	X	X	X
	Accuray	jcambra@accuray.com	X	X	X	X	X
Kamal Gogineni	Radion	Kamal.gogineni@radionglobal.com	X			W	
Ulrich Busch	Varian	ulrich.busch@varian.com			X	X	X
	Varian	mika.miettinen@varian.com		X	X		
Scott Mark	Third Way		W				W

Surrender Kapoor	TSG		W	W	W		
Sidrah Abdul	ASTRO		W	W	W	W	
	BrainLAB	christof.schadt@brainlab.com			W	W	
Daniel Yeung	UF Jacksonville					W	W

Meeting Minutes

I. Call to Order [1/24/11 @ 9:05]
   a. Approval of Agenda [no objections]
   b. Approval of minutes form November 2nd, November 4th-6th [no objections]

II. Draft Agenda Items (from Meeting Minutes, 11/04-06):
[http://wiki.ihe.net/index.php?title=Radiation_Oncology_Technical_Committee]
   a. IPDW (<0.5 day)
   b. DPDW (0.5 -1 day)
   c. TF/Supp Cleanup and Approval for ARTI, MMR-RO, TDW (0.5 day)
   d. Safety Related Profile (1-1.5 day)
   e. Structure Set Templates Update (2 hrs)
   f. Pre-planning Workflow (ADT + Sim/Acquisition) (1 day) *renamed to* Patient Registration and Worklist for CT Sim

III. Timetable:
   a. 01/24:
      - TF/Supp Cleanup & Approval
      - Structure Set Templates
      - Patient Registration and Worklist for CT Sim
   b. 01/25:
      - Safety Related Profile
   c. 01/26:
      - Safety Related Profile
      - Final review / approval of Vol 2 section of ARTI profile for CP
      - Patient Registration and Worklist for CT Sim Use Case sub-group
   d. 01/27:
      - DPDW
      - IPDW
   e. 01/28:
      - Set agenda for next meeting
      - Review Action Items from this meeting
        1. Working group for patient safety
      - Review Schedule of upcoming meetings and Tcons
        1. TCONs for judging (after Domain Pre-Testing)
      - Other items as time permits
        1. Profiles/Actors for 2011 Domain Pre-testing
        2. Profiles/Actors for 2011 Connectathon
        3. Test tools
        4. Approval of Supplements MMR-RO and TDW Final Text

IV. TF/Supp Cleanup & Approval – Review of Sue Reilly spreadsheet summary ("For Bruce Sue Updates 30Dec10.xlsx") [1/24/11 @ 9:15]

a. Block Mounting Position (PATIENT_SIDE/SOURCE_SIDE) – ARTI profile requires source side mounting of blocks and Oncentra supports only source-side blocks. **ACTION: change Attribute Note for Block Mounting Position (300A,00FB) from "Shall be SOURCE_SIDE" to "Shall be present (shall be handled safely for all enumerated values not supported"**

b. Leaf Position Boundaries (300A,00BE) in Basic Static – Allow use for jaws? Should type be O+* or blank? **ACTION: Refer to WG-7, change Attribute Note for Leaf Position Boundaries (300A,00BE) from "May or may not be present for jaws" to "May or may not be present for jaws. <u>May be ignored for jaws</u>." Type is "O+*" (Make consistent for all beam types). Refer to DICOM WG-7. BHC to draft CP.**

c. Table Top Pitch Rotation Direction **ACTION: Make R+* for consistency**

d. Referenced Dose Reference Sequence (300C,0050) – needed for target dose accumulation. This shortcoming in trial-implementation version of the profile was identified in Domain Pre-Testing in Granada, June 2010. (Not tested in 2010 Connectathon.) **ACTION: Add requirement for Referenced Dose Reference Sequence and Cumulative Dose Reference Coefficient (R+*). To be flagged as significant in Change Proposal. Also notate Connectathon results and updated profile appropriately to identify change.**

e. Review of TF document ("IHE_RO_Supplement_Advanced_RT_Objects_Interoperability-TFVol2__1.2.7-TI-Ver6.docx")

- Document has been reorganized to centralize requirements wording for optional beam modifiers that is consistent across beam types.
- Gantry Pitch Angle (300A,014A) – Type: O+* Note: "If not present, shall be assumed to be nominal position. If present, may not be ignored."
- **ACTION: Add statement to TF header, clarifying semantics of the phrase, "May not be ignored."**
- Clarified requirements for Gantry Rotation Direction (300A, 011F) to disallow bi-directional motion, but allow "NONE" in the final CP.
- Stereotactic Beam Technique – **ACTION: Improve descriptive text for the Stereotactic Beam Type to clarify the behavior differences (use of applicator for photon beam). Also applies to Stereotactic Arc Beam.**
- Beam Limiting Device Angle (300A,0120) **–** Specific Rules have been removed (requirements in DICOM standard).
- Beam Limiting Device Rotation Direction (300A,0121) **– ACTION: Remove constraints on Beam Limiting Device Rotation Direction (requirements as in DICOM standard). Add statement that if CW or CCW may not be ignored.**

- Final Cumulative Meterset Weight (300A,010E) and Cumulative Meterset Weight (300A,0134) – **ACTION: Keep Presence: R+*, Specific Rules: (blank).**
- Table Top rotations (R+*) must all be constant, rotation directions (R+*) must all be NONE, Eccentric Axis Distance (O+*) must constant, if present.

f. Bruce to post updated TF to meeting thread on BBS; TC members to review before Wed. 1/26 and provide feedback for final review in Wed. morning.

g. Final review / approval of Vol 2 section of ARTI, MMR-RO profile for CP [1/26/11 @ 13:50]

- Change Proposal (when approved) will be used for all future testing.
- Inconsistency between Referenced Series Sequence (0008,11115) requirements in MMR-RO Profile and DICOM standard: The DICOM Standard has changed: the Referenced Series Sequence (0008,1115) was a Type 1 – this was problematic if there was nothing to reference (i.e., when no image instances are referenced and only frames of reference are referenced). It is now a Type 1C (required if instances are referenced). No further change is required.
- Beam Meterset (300A,0086) data element was overlooked in ARTI Profile. **Include Beam Meterset (300A,0086) as R+ in the CP.**
- Support for optional features (beam modifiers) in ARTI Profile: A manufacturer's integration statement *must* list optional features (beam modifiers) that are supported by an actor. **Modify supplement to identify optional features and add information in Vol. 1 indicating how to specify optional features in an Integration Statement.**
- **Compensators to be allowed in Step and Shoot Plans.**
- **Applicator Type (300A,0109) in Stereotactic Plan and Stereotactic Arc Plan: Add new Defined Terms PHOTON_SQUARE, PHOTON_RECT, PHOTON_CIRC.**
- **Block Mounting Position (300A,00FB): Eliminate requirement that this element have the value SOURCE_SIDE. Type remains R+.**
- **ACTION: Supplement text to be updated and circulated for review and approval.**

V. Structure Set Templates Use Case [1/24/11 @13:30]

a. Discussion of Structure Name Template document (W. Bosch 1/24/11)

b. Structure Name definition specified by (a) Nomenclature scheme/version, (b) Protocol/sub-protocol (patient subset), and (c) Structure (ROI)

c. Add Structure Definition UID

- Need a structured/coordinated means to assign a UID for each (Nomenclature Scheme, Version, Protocol, Sub-protocol, Structure) tuple

- Use DICOM RT ROI Identification Code Sequence (3006,0086) to store ROI Definition UID? Possible issue: definition of this sequence in DICOM PS3.3 2009 is not completely consistent. (Baseline CID 96 could not be found in 2009 standard.)
- Use Clinical Trials ID tags for protocol?

d. Encoding in RT Structure Set
    - Encode Standard Structure Name as ROI Name
    - Encode Structure Definition UID as RT ROI Identification Code Sequence

e. Outstanding Issues/Next Steps
    - Encoding of template – look at what IHE-ITI has done (XML, etc.)
    - Encoding of Structure Definition UID in DICOM WG-7 (CID 96?)
    - Confirm compatibility with 2nd Gen RT objects
    - Check consistency with existing IHE-RO Profiles, esp., those dealing with contouring
    - What to do with TP Optimization Structures that are used to steer dose by specifying constraints on inverse planning optimization (e.g., Ring)?
    - Implications for scheduled workflow (prescription, segmentation)
    - Where/how to store Nomenclature Scheme/Protocol ID used to define structures. Alternatively, perform reverse look-up of nomenclature/protocol from Structure Definition UID.

VI. Patient Registration and Worklist for CT Sim Use Case [1/24/11 @ 15:30]

a. Patient Demographics transfer to CT Sim. Discussion in San Diego (Nov 2010) about sending ADT information to CT Sim (via TMS)
    - Actors could include CT Sim, TMS, and HIS
    - It seems likely that a considerable portion of this profile could be adapted from IHE-RAD Scheduled Workflow Profile.
    - TMS to CT Sim messaging can use DICOM Modality Worklist

b. What is the Scope of this Use Case? Demographics transfer? CT Sim? Billing? Scheduling? → Patient Registration and Update is the Big Thing

c. Is the message from ADT (to TMS) a Patient Registration or a Patient Update? The ADT may send a Patient Registration message (even if the patient has already been entered in the TMS). Should the TMS reject the Registration? Should it treat the Registration as an Update (reconciliation)?

d. Next steps/open questions
    - Are TMS vendors interested in making this happen?
    - Contacts for HIS vendors to open lines of communication
    - Contacts for CT Sim vendors (Siemens, Philips, GE) for connectathon (and to confirm support for Modality Worklist in CT Sim products)
    - Is HL7 version 2.5 acceptable to HIS vendors?

e. Sub-group to develop profile (chair TBD)
    - Norman Trapp (chair pro-tem)
    - Koua Yang
    - Kamal Gogineni
    - Jeff West

- Uli Busch (or designate)
- Sam Brain
- Rishabh Kapoor

f. **ACTION: Norman to call meeting of sub-group, elect chair.**

VII. Safety Related Profile [1/25/11 @ 9:40]

a. Review of Patient Safety Related Profile from the Nov 2010 TC meeting in San Diego. Comments from Sha Chang regarding AQuA were presented: validation of data transferred from TPS to TMS. Software interlocks are more effective than user training in preventing errors. Requires "forcing function". Focus use case on *automated* checking of data in a *multi-vendor* environment.

b. Possible safety related use cases
   - Round-trip data transfer check
   - Workflow Automation of Manual QA checks
   - <u>Plan consistency/sanity check: Do the specified MUs make sense?</u>

c. **Round-trip Data Transfer check:** Opportunity for data loss at several points in workflow: (a) Export of plan from TPS as DICOM RT Plan, (b) Import of plan into TMS (at time of approval), and Export of plan from TMS for delivery. Complication: plan may be modified in TMS. Difficult to detect *meaningful* changes in a plan. The cost of fingerprinting plans is high. There are better ways to do this (other options should address the same concerns).

d. **Workflow Automation of Manual QA.** Application of UPS workflow to support manual QA/approval automation. Multiple plan approvals needed and can be used to interlock treatment delivery by Dosimetrist, Physicist, and Physician. Some of this functionality is now supported within TMS environments. This is likely a straightforward extension/variation of automated QA.

e. **Dose/MU consistency check:**
   - Can be adapted from existing IHE-RO ARTI and UPS-based delivery workflow profiles.
   - Requires treatment machine characterization.
   - Need to define how workflow instruction and results are communicated.
   - Support for development and testing of QA checker actor products could (a) use ARTI plan data, corrupt it while maintaining DICOM conformance (e.g., drop MLC or wedge), and (b) adapt UPS-based delivery workflow test tools to develop a reference implementation for QA workflow.
   - State-less versus stateful QA checker model: State-less approach performs dosimetric "sanity" check of plans without reference to history of plan parameters. Stateful compares plan with historic plans to identify parametric changes. The latter is much harder to do and it is not clear that it is worthwhile.
   - MU checker can evaluate plan meterset with respect to nominal Beam Dose and Beam Dose Specification Point in RT Plan. **N.B., the Beam Meterset (300A,0086) data element is not required/constrained in the ARTI Profile.**

- In addition to plan MU sanity checker at TPS, TMS, TDS, a generic QA checking structure could support (a) contour checker at TPS, (b) IMRT QA checker in TMS, (c) in-vivo or real-time dosimetry check.
- Identify and exploit redundant information in DICOM RT Plan and between plan and delivery equipment that can be used to check consistency.

f. Review of treatment errors/accidents and their sources:
    - Dynamic MLC missing from data used to perform delivery. The RT Plan provided to the treatment machine was in error and treatment was delivered with clinically harmful data. **A dose/MU consistency checker would detect this error.**
    - Wedge incorrectly programmed into treatment delivery machine. **Wedge-in-place *vs.* missing would be detected by a dose/MU checker, an error in wedge orientation would not.** Current products have been designed to prevent this failure mode.
    - Machine-mounted treatment aids defined in the plan (received by the machine) were incorrectly placed or missing on the machine during delivery. Errors range from minor (wedge orientation error) to major (wrong field size for SRS cone). Many of the devices involved have no physical interlocks. **A dose/MU consistency checker will *not* detect this error. A machine parameter verifier and/or physical interlocks can be used to detect and prevent this error. The DPDW Profile includes aspects that address this error, but complete development and implementation of this profile are not expected in the timeframe desired. The ARTI profile defines the content of plan that a TDD must be capable of interpreting. Current TDDs can use this profile as guidance for interpreting the contents of a plan and handling its content safely.**
    - Incorrect calibration of treatment resulting from use of incorrect measuring device or incorrect analysis tool. **A dose/MU consistency checker will *not* detect this error *unless* the calibration data used for the consistency checker is independently derived *or* "golden beam" data are used for the MU checker. Addressing this issue is outside the scope of the IHE-RO to address.**
    - QA policies (esp. plan QA) were not in place or were not followed. **A dose/MU consistency checker *may* detect this error. Constructing departmental workflow to implement better-structured approvals and the ability to inhibit treatment if approvals are not done will address this problem, but this is a long-term solution.**
    - The TPS does not provide all information required for treatment. Manual insertion of this information in the TMS can introduce errors. **A dose/MU consistency checker *may* detect this error.**

g. The lack of content profiling for treatment delivery (RT Plan, RT Beams Treatment Record) data represents a gap to be filled. Filling this gap will help to address safety issues.

h. Primary Task is to inspect RT Plan object: Self consistent? Sufficiently specified? Safe to proceed? Result: (No) error(s) detected

i. RT Plan Tests:
   - **Simple Meterset validation from dose D (point dose calc)**
   - Complex Meterset validation from dose D (3D dose calc)
   - Plan Comparison
   - IMRT QA Check
   - Region of Interest Checker
   - Real-time Dose Check

j. Open Questions:
   - What information is needed (in the RT Plan) to permit effective checking? E.g., Beam Meterset?
   - Do we need multiple dose reference points in the RT Plan to be able to perform dose/MU consistency check?
   - What means must be provided to communicate results of the check? Evidence object?

k. Homework 1/25
   - **What actors are needed for the Safety profile?**
   - **Review revised ARTI Profile Supplement document for vote on approval.**

l. Safety Profile Actor discussion [1/26/11 @ 8:45]
   - Actors (Revised Proposal):
     1. Check Requestor
        a. Issues a request (UPS?) to an entity for a validation check to be performed. Will accumulate a list of the data elements required for the check and pass 'pointers' to those entities in the request.
        b. Receives a 'check performance' status from the Check Performer (and possibly evidence?).
     2. Check Performer
        a. Receives a request (UPS?) for a validation check to be performed and performs it (if appropriate). Returns an appropriate value (can't do, failure, no errors found, …) and potentially supporting evidence (SR, …). Request will include 'pointers' to files, objects, etc. that are necessary to the check to be performed.
        b. Issues a status response on the check to the Check Requestor. May also produce evidence, which can be stored in the archive or …
     3. Archive (infrastructure)
        a. May have objects necessary to the Check Request stored on it

b. May receive Check Performed evidence for storage

- Discussion
  1. Data supplied to Check Performer by Check Requestor (pass by value) or retrieved from an Archive (pass by reference)? Passing by value assures that the data checked are the actual instance(s) held by the requestor, but requires *communication* of data between actors in the profile (not just to/from an archive)? This has implications for testing.
  2. How is Quality Check *evidence* to be maintained? Structured Report? Need to <u>maintain evidence *outside* the data object(s) checked</u>.
  3. Concern was expressed that *requiring* the use of an Archive to supply data is not consistent with current practice in many clinics and may limit the applicability of the Profile.
  4. Data can be supplied to the Check Performer *both* directly (by value) and indirectly (by reference). Data passed by value are pushed to the Checker actor's storage SCP and <u>the Checker's own AE title is used the UPS Worklist Input Information Sequence to indicate that the data are to be retrieved (locally) from the Checker itself</u>.
  5. Should the *initiation* or the *completion* of a workflow step (or *both*) be interlocked? Both models are viable.
  6. Do we need to define *classes* of Check Performers? How specific? How granular?
  7. Do we need a seprate IHE-RO *content profile* to define what needs to be in the RT Plan for delivery (e.g., require Beam Meterset data)? This could be derived from ARTI Profile with the addition of requirements for deliverable plans. Could also include content requirements in a baseline Plan Deliverabilty Check?
  8. Do we want to restrict the scope to the specific TDD "time out" use case for now? Is it sufficient to provide the *means* to solve the Safety problem? Do we need to define explicitly the workflow context ("time out") of the QA Check? → **Consensus: include *both* in the Profile:**
     a. Specialized MU/Dose Plan Validator
     b. **Generic Peer-to-Peer Check Performer**

  9. For future discussion
     a. Need to define what constitutes *evidence*.
     b. Structured, Semantic Checksum of RT Plan Information as a low-cost security token (digital signature) on core data in a plan. (Must be selective about what data elements are included and consistent in how data elements are encoded.)

  10. Information required to perform MU/Dose Plan Validation

a. RT Plan
b. CT Image?
c. RT Structure Set?
d. RT Dose?
e. Evaluation criteria (out-of-band configuration?)
f. Machine characterization (out-of-band configuration?)

11. Behavior of MU/Dose Plan Validator
    a. Role of Validator is to detect *catastrophic* errors. ("plan veto') ideally at the last workflow step at which a RT Plan instance exists.
    b. Reporting of check result, i.e., go/no-go for treatment. (Reporting of MUs calculated by Checker, MUs in the plan, %error, etc. is out-of-scope for this profile.)
    c. Evaluation criteria from out-of-band configuration file (per TDD, treatment technique?) Could use Nominal Beam Dose to select agreement criterion.
    d. Granularity of MU/Dose check response: reject *entire* plan if *any* beam fails check.
    e. Should the Plan Check instruction support selection of a subset of beams within the RT Plan instance (like Beams Delivery Instruction)? NO. The *entire* plan is the unit of work.
    f. Task is internal consistency check, comparing MUs listed in the plan with MUs calculated by Checker from Beam Dose, etc. Insufficient data exists in the RT Plan to re-calculate MUs in some cases, e.g., for Arc plans. In such cases, additional data will be needed. The Checker must parse the plan and retrieve the additional data needed, e.g., RT Structure Set, CT Image Series, RT Dose, …
        i. **What happens when there is insufficient information in available instances to compute MUs? E.g., Arc plans without RT Structure Set. In such cases, no check can be performed, and the appropriate response from Checker is Procedure Step Cancelled (definite "don't know").**
        ii. Do we need a separate Actor (with content requirements for SSD, depth information…) to address the situation in which there is no RT Structure Set? Could also require that this information is *always* required *if* there is no Structure Set.
        iii. **We need input from QA vendors regarding the information required to perform check.**
        iv. In performing QA for Tomo and Accuray (and other non-C-arm-Linac devices, what data are used to convey plan content? Should the scope of the

current profile be narrowed to C-arm linacs (ARTI Profile) only? May also include Ion Plan?

v. What about non-DICOM-based TDDs? R&V system could synthesize DICOM RT Plan and send to Checker.

g. **Open question: Which UPS model should we use?** The simple UPS Push Model (Checker is SCP, Requester is SCU) is more natural for the Peer-to-Peer MU/Dose Checker, but the Pull Model is more consistent with delivery workflow and will likely be needed for the Scheduled Checker later.

VIII. DPDW Profile

a. Draft Supplement (IHE-RO_DPDW_Supplement_1.6.doc dated 2010-11-12) splits DPDW into four profiles: (a) (Communication of TSM to TMS) Integration Profile, (b) Discrete Positioning Workflow Integration Profile (positioning prior to treatment), (c) Discrete Delivery Workflow Profile, and (c) Discrete Delivery and Monitoring Workflow Integration Profile. The author has taken this approach to manage the complexity of options in writing the Supplement.

b. **Profile Organization:** Concerns were raised regarding the fact that the draft splits positioning and delivery into separate profiles. It was agreed that this topic would need to be revisited by the TC well before (1-3 months) the Supplement goes out for Public Comment.

c. **Actors:** The current model decomposes workflow into distinct Archive, TMS, TDD, PPD(s), TSM, PPVS, and PPRS Actors.
   - Actor Definitions are in Volume 1, Appendix A
   - Profile development will continue with this set of actors. However, combining some pairs of Actors may be reconsidered, if exposing the internal communication within products that fulfill the role of such Actor pairs is judged to be unreasonable.

d. Substantial work remains in defining Transactions.

e. **The topic of storage and retrieval for delivery workflow profiles needs to be discussed with respect to**
   - Multiplicity of storage actors?
   - Configuration?
   - Role of TMS as Storage? TMS relationship to Archive?

f. **Day Zero Use Case** ("dry run", i.e., Positioning and Imaging Only): Need to ensure that the closure occurs on Session End with or without treatment delivery. I.e., when the patient leaves the room the session is ended.

g. Extensive discussion of integrating Safety Profile in delivery workflow
   - Add Check Performer Actor to DPDW Profile (and all other treatment delivery profiles). A Validation Request Transaction is to occur between TDD and Check Performer Actors just before (as near as practical) treatment. The TC has not yet reached consensus as to whether this transaction should ultimately be *required* or *optional*.
   - Integration of other QA Checks (Validation of Patient Position, etc.) should also be considered.

h. The Machine Parameter Verifier Actor needs to be included in the DPDW Profile. (Its use may be optional.) The behavior of this actor is defined in DICOM Supplement 74.
i. A **DPDW sub-group** is to be activated to continue work on this Profile.
    - Uli Busch (chair)
    -
    - David Wikler
    - Sanjay Bari
    - Norman Trapp
j. Discussion of Workflow Profile Testing Issues (Bosch, Curran): concerns regarding the large number of Actors involved in this profile.
    - Can we use Test Tools to take the place of Actors in a Connectathon?
    - What fan-in/fan-out is acceptable?

IX. IPDW Profile

a. Draft Supplement (IHE-RO_IPDW_Supplement_1.3.doc) was reviewed by the TC.
b. Profile to reference final versions of DICOM Supp 96 and Supp 74.
c. In IHE Radiology TF Vol. 1, Rev. 9, the last paragraph in sect 3.2 (Scheduled Workflow Integration Profile Options): "The Evidence Creator, Acquisition Modality and Image Manager/ Image Archive will likely support a variety of DICOM SOP Classes. It is expected that this level of optionality will be documented by a reference in the IHE Integration Statement (see appendix D)."
d. **Day Zero Use Case** ("dry run", i.e., Positioning and Imaging Only): Change Treatment Step to be *conditional*, required when there is no other positioning step. (To be documented in Integration Statement by reference to DICOM Conformance Statement). Likewise, the Positioning Step is also *conditional*, required if there is no Treatment.
e. How to support Ion Beam and Brachytherapy in Treat Step?
    - We could (a) define separate Actors or (b) allow optional support for treatment modalities? **Consensus: (b) i.e., keep Actors as they are with optional support for convertional, ion, and brachytherpy. Support for optional features to be documented in the Integration Statement for TMS and PDS.**
    - Need to include RT Ion Plan, RT Ion Beams Treatment Record, RT Brachy Application Setups Delivery Instruction (currently in development), RT Brachy Session Record, and RT Ion Beams Treatment Record in Input Information Sequence for PDS Actor and Transactions to retrieve and store these SOP classes.
    - Note that several of the workflow instruction IODs referenced by this profile are defined in DICOM Supp 147 (currently in draft).
f. In 2.2.4.1.1 (Trigger Events) add language indicating that the PDS must use RO-17 to set the treatment session IN PROGRESS before proceeding with the first UPS. *All* UPS for the treatment session must be locked (set IN PROGRESS) before *any* is started (N-SET 0).
g. In 1.1.4.2.2 (Non-Treat Steps) add: A PDS must be capable of at least one of the procedures of the type defined in this section.

h. How does the PDS know it has retrieved *all* of the UPS for a treatment session?
    - The N-SET 0 transaction for the first workflow step will fail unless *all* of the UPS have been set IN PROGRESS.
    - What if a session consists of multiple plans (needed for robust delivery of multi-iso-center therapy, e.g., breast). → Procedure Steps for each plan are grouped by scheduled delivery time.
    - Consider adding a Manifest PS, or identifying UPS within a session as N of M, where N = 1, 2, … , M.

i. Support for Dose Reporting for Radiation Exposure to be required if the progress indicator of acquisition UPS involving dose delivery is >0 and no treatment record is present for the dose delivered. Dose reporting (DICOM SR) objects are needed to satisfy regulatory requirements.

j. Progress Update for Treat and Non-treat Steps

k. Changes to Profile necessitated by changes in DICOM Supp 96 (ownership of UPS).

X. Next IHE-RO TC Meeting May 3-6, 2011 (before Domain Pre-Testing in Stockholm)

a. Agenda
    - Patient Registration for CT Sim (0.5 day)
    - Safety (1.5 day)
    - IPDW (0.5 day)
    - DPDW (0.5 day)
    - Structure Templates (0.5)
    - Misc (0.5)

b. ACTION (Stuart): Send out logistics for meeting

XI. Safety Sub-group

a. Members
    - Chris Pauer (chair pro-tem)
    -
    -
    - Uli Busch
    - Koua Yang
    -
    - Norman Trapp
    - Mattias Birkner (IBA)
    - Eli Stevens (Mobius)

b. Meetings
    - Sub-group T-con (Feb 7)
    - IHE-RO TC T-con, Feb 17, 2011

XII. Action Items [1/28/11 @ 9:00]

a. Define working group for Patient Safety Profile (Chris as Chair Pro-tem)

b. Bruce to recruit additional Safety Check vendors (ASTRO, AAPM)

c. Stuart to send out logistics for May meeting (Strockholm)

d. Norman to set up PRW/CT Sim (request via Sidrah)

e. **Uli to work with DPDW to get scheduled meetings**
f. **Bruce/Sue to finish ARTI revisions for CP**
g. **Walter to review SSTemplates coding with IHE-ITI (Rob Horn)**
h. **Uli to finish IPDW, be ready for public comment vote in May**
i. **Uli to find "primer" / resources on Supp 96 / worklists**
j. **Bruce to draft DICOM CP for Leaf Position Boundaries to WG-7**
k. **Rishabh to work on acquisition of Dose Compositing Test Data**
l. **Stuart to remove Dosimetric Plan Retrieval RO-9 from Geometric Planner Transactions**
m. **Norman to reformat MMRO Integration Profile as Supplement**
n. **Bruce to create BBS thread for MMRO document.**
o. **Uli to update TDW Integration Profile Supplement as Ver 1.2**

XIII. TCONs for Judging (after Domain Pre-Testing)

XIV. Profiles / Actors for Domain Pre-Testing
a. Dose Displayer (Basic)
b. General Dose View (Dose Comp)
c. TMS (ARTI)
d. TMS (IPDW)
e. TDD (TDW)
f. All objects (revised ARTI)
g. Contourer (Basic)
h. Available for others
- Basic (all)
- ARTI (all)
- TDW (TMS)
- MMRO (all)
- Archives (all)

XV. Profiles / Actors for 2011 Connectathon
a. All objects (revised ARTI)
b. Dose Displayer (Basic)
c. General Dose Viewer (Dose Comp)
d. TMS (ARTI)
e. Contourer (Basic)
f. All (MMRO)

XVI. Test Tool Development
a. 2nd Revision of ARTI Test Tools
- Revised objects for Test Data

b. Dose Compositing (doesn't appear to be needed for 2011)
- Acquire Test Data in preparation for Test Tools development

c. Possible Patient Safety Profile towards end of year
- How to define objects for Test Tools?

XVII. Approval of MMRO and TDW supplements to Final Text

a. No approval at this time.
b. Document status
    - Basic RT is in TF Ver. 1.6 (Final Text) on Wiki (to be revised as 1.7)
    - The next Version of the TF will be 4.0.
    - *Version 2.0, now defunct includes MMRO*
    - *Version 3.0, now defunct, included IPDW*
    - IPDW is now in Supp ver. 1.3 (to be revised as vers. 1.4) in IPDW ("Integrated Positioning and Delivery Profile" thread on BBS)
    - DPDW is now in Supp ver. 1.6 (to be revised as vers. 1.7) in DPDW ("Discrete Positioning and Delivery Profile" thread on BBS)
    - Dose Compositing is now in Supp vers 1.0 (Trial Implementation) in Dose Compositing Issues thread on BBS
    - TDW is now in Supp ver 1.1 ("Version 1.1-TI Rev 4" in "Treatment Delivery Workflow Supplement" thread on BBS) – check that this calls out changes to Supp 96 (Uli to update as Ver. 1.2)
    - ARTI is now in Supp 1.2.9 (CP to Revise Document) to be posted to "Advanced RT Objects Interoperability Supplement" thread on BBS)
    - MMRO (Trial Implementation) to be posted to BBS
    - Enterprise Schedule Integration (Draft)
c. BBS Thread Names to be cleaned up (Bruce to request changes from Farhana)

XVIII. Future Meetings
a. IHE-RO Technical Committee Face-to-Face Meetings
    - **Domain Pre-testing** May 3-12, 2011 (TC meeting May 3-6, Setup May 7, Testing May 9-11, Half-day wrap-up meeting May 12) - *confirmed*
        1. Venue: Elekta (Stockholm)
        2. Hours: 8:30am – 6:00pm
        3. Stuart to distribute logistics via Sidrah
        4. Profiles: Dose Compositing, IPDW, new actors on old profiles

    - **Connectathon 2011** – ASTRO HQ, Fairfax, VA, **Sept. 12-18, 2011**
      NOTE: New Dates
        1. Setup Sept 12
        2. Testing Sept. 13-16
        3. TC meeting Sept 17-18 (ends noon on Sunday)

    - **ASTRO 2011** - Thurs Oct 6 – Noon Sat Oct 8 (in Miami) - *confirmed*

b. IHE-RO TC Future Teleconferences
    - Thursday, February 17, 12:00 – 2:00pm ET
    - Thursday, March 17, 12:00 – 2:00pm ET
    - Thursday, April 21, 12:00 – 2:00pm ET
    - Thursday, June 16, 12:00 – 2:00pm ET
    - Thursday, July 21, 12:00 – 2:00pm ET
    - Thursday, August 18, 12:00 – 2:00pm ET

c. Related meetings

- ESTRO
    1. ESTRO Physics Conf. May 8-12, 2011, London
    2. ESTRO Ann Mtg. Sept 23-27, 2011, Stockholm, SW
- AAPM Annual Meeting
    - July 31-Aug 4, 2011, Vancouver, BC
- ASTRO Annual Meeting
    - Oct 31 – Nov 4, 2010 in San Diego, CA
    - Oct 2-6, 2011, Miami, FL

- PTCOG, May 8-15, 2011 in Philadelphia
- WG-7
    - Dec 7-10, 2010 (MITA, Washington, DC)
    - Mar 29-Apr 1, 2011 (Munich)

XIX. Adjourn [1/28/11 @ 11:30]