IHE-RO Technical Committee
Face-to-face Meeting
Stockholm, Sweden
May 3-6 and May 12, 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.*

Hours:

Tuesday, 5/03/2011	8:30am – 6:00pm
Wednesday: 5/04/2011	8:30am – 6:00pm
Thursday: 5/05/2011	8:30am – 6:00pm
Friday: 5/06/2011	8:30am – 6:00pm
Thursday, 5/12/2011	8:30am – 12:00pm

Attendance X = in person, W = via Webex

Name	Company	Email	5/3	5/4	5/5	5/6	5/12
Bruce Curran	RI Hosp./ASTRO	bcurran1@lifespan.org	X	X	X	X	X
Stuart Swerdloff	Elekta	stuart.swerdloff@elekta.com	X	X	X	X	
Walter Bosch	Wash. U./ATC	bosch@wustl.edu	X	X	X	X	X
Rishabh Kapoor	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
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Meeting Minutes

I. Call to Order @ 9:10 am, 3 May 2011
   A. Approval of Agenda – approved without objection
   B. Approval of minutes from April 21 conference call. – approved without objection

II. Agenda Items (from Meeting Minutes, Jan 24-28):
   [http://wiki.ihe.net/index.php?title=Radiation_Oncology_Technical_Committee]
   A. Patient Registration for CT Sim (0.5 day)
   B. Safety (1.5 day)
   C. IPDW (0.5 day)
   D. DPDW (0.5 day)
   E. Structure Templates (0.5)
   F. Misc (0.5)
   G. Other Business
      1. IHE-RO Leadership Meeting Report
      2. IHE-RO Planning Committee Update – New Profiles
      3. ASTRO / FDA – Possible role of IHE-RO in Regulatory Testing?

III. Timetable:
   a. 05/03:
      i. Patient Registration for CT Sim
      ii. Structure Set Templates

   b. 05/04:
      i. Safety Related Profile
   c. 05/05:
      i. Safety Related Profile
      ii. IPDW
         1. Vote on Trial Implementation
   d. 05/06:
      i. DPDW

ii. ARTI profile
iii. Approval of MMR-RO and TDW Final Text

e. 05/12: Half Day
i. Follow up to Domain Pre-Testing
ii. Set agenda for next TC meeting (June 16 TCON)
1. Change future Connectathons to be earlier in year?
iii. Other Business

IV. Business

A. Patient Registration for CT Sim (0.5 day)

1. Radiation Oncology Workflow Exchange with HIS Use Case on Wiki
   a. Working Group: Rishabh Kapoor Rishabh Kapoor, Jeff West, Chris Ising, Kamal Gogineni, Madhavi Kapa
   b. Tcons have discussed the current support for demographic information exchange by CT Sim systems: vendors support Modality Worklist; next call to examine whether DICOM Modality Worklist can be used to support RT workflow and what (HL-7) alternatives exist for this purpose.
   c. Variation of Workflow models: North American, European, Japanese
2. TC Feedback
   a. Preliminary sketch of Profile with HIS, TMS, Modality, Contourer, G-Planner Actors
      i. Transfer (HL7) of demographics from HIS → TMS (Patient Registration, Patient Update transactions)
      ii. Schedule image acquisition (Modality Worklist) on imaging modality TMS → Modality
      iii. Schedule segmentation (UPS) TMS → Contourer
      iv. Schedule geometric planning (UPS) TMS → Geometric Planner
3. ACTION: Rishabh to create BBS thread for public record of activity for this group
4. Next T-con for this working group on May 12.

B. Structure Templates (Walter Bosch)

1. Reviewed document from January Meeting (110502a)
   a. New model allows structure set specific to a protocol to be defined
   b. What are the profile actors and transactions?
      i. Template Producer / Consumer?
      ii. Enduring references across Structure Set Users
      iii. Is it that there is a Standard Source and only readers?
   c. What constitutes a conformal structure set?
      i. Minimal set of structures, can be additional structures
2. Long discussion on problem 3 (see PC Use Case on IHE-RO wiki), may involve different structure sets at different points of planning process
   a. Do we need to? (enabling certain structures (e.g. carina) at certain process points)
   b. Would have multiple SSets for each patient, according to the process step
      i. How do you do the accounting / tracking?
      ii. If we want to sort them, may need a SSet process tracking tag to sort on
3. Method of encoding template could be XML or perhaps a Structured Report

a. An SR would be useful for sending along with a segmentation instruction. However it's not patient-oriented, so not likely to be in a PACS or archive.
b. We believe that a URI can be used to point to a file
c. ACTION: Need to verify functionality of a URI to pull a non-DICOM Template file (noted as likely not a solution in later discussions)

4. Do Structure Templates acquire a UID (Does it need to)?
   a. Naming Authority (would need ORG root)
   b. How do users create standardized templates on their own?
      i. Need E-R Diagram to help solidify PC use case(s)
      ii. Full ID of a structure is by Template UID + TBD
5. Actors
   a. Template Producer
   b. Template Consumer
   c. Template-Aware Contourer (communicates privately with Template Consumer)
6. There was much discussion on structure ID (Problem 1) vs Business Rules (Use Case Problem 3 & 4)
7. It was decided that Process steps (Business Rules) should not be in the Structure Template File
8. The Template will be a set of attributes followed by a list of structures with their attributes
9. TC Resolution: Identify Structures using the Code Sequence Macro in RT ROI Identification Code Sequence (3006,0086). Template contains entries for the Code Sequence Macro that can be plugged into the Code Sequence.
   a. Multiple Code Schemes can be used in a template to allow mixture of Protocol Template and local (or other) extensions, e.g., for dose-steering structures, treatment accessories, etc.
   b. This resolution handles problems #1, 2, and 4 in PC Use Case (see IHE-RO wiki)
   c. Actors would be a Template Consumer, Template Producer and a new Contourer
      i. For Consumer there is no output (testing done on output from Contourer)
      ii. Template Consumer will have a private interface to a new Contourer.
      iii. Recommendation is to use RT ROI Identification Code Sequence (3006,0086)
      iv. Origin of Code Scheme can be specified in SOP Common, which can accommodate multiple schemes
      v. Template shall be developed in XML
      vi. Is there a place to store the Template UID in the RT SSet? Not really, but will leave in for the time being, likely to be useful later.
      vii. Need to review if Clinical Trials stuff should be in the profile. Could include Clinical Trials ID tag values (optional)
      viii. How to deliver the code schemes to the world; should be XML as well and consistent with format in Template
   d. Suggest problem #3 (application of templates to other RT workflow tasks) be the subject of a separate use case (separate Business Logic specification for each task).

C. IHE-RO Focus Group Meeting, March 3-4, 2011, Gainesville, FL (Bruce Curran)

1. Communicating the goals and process of IHE-RO
2. RFPs – User Oriented Configuration Tool
3. Product compliance issues, including test tools for users
4. FDA / product review issues
5. Mika Miettinen – gap analysis for IHE-RO profiles
6. Suggestion to re-use ARTI with TMS as producer and TDD as consumer – to be evaluated
7. Action Items include:
    a. Purchase IHE-RO.net and IHE-RO.org domains
    b. PRO article
    c. CMS Town Hall meeting presentation (J.R. Palta)
    d. HL7 Use Case
    e. Mika use case for Total Profile
    f. Roster Listserve WG7
    g. RFP text
    h. IHE-RO Business Plan
    i. Clinical adherence – PC document
    j. Grant development
    k. Communication to Physicians
    l. SROA presentation
8. IHE librarian Mary Jungers to review style of profile documents to maintain consistency of IHE documents.
9. IHE Technical Review Board – proposal from subcommittee of IHE Int'l and Testing and Tools Committee: Profiles to be reviewed for technical validity prior to publication. This is still under consideration. There is concern about the technical skill and domain knowledge of reviewers. It is believed that there are problems of inconsistency in some profile documents.

Adjourn for the day 5/3/11 @ 5:55pm

D. Safety (Chris Pauer) – 5/4/11 @ 8:50am

1. Tcon (4/28) provided a review of UPS (DICOM Supp 96) – several QA vendors attended.
2. Review of Quality Assurance with Plan Veto (QAPV) Profile Draft
    a. Intent is to check for catastrophic dosimetric errors and potentially patient positioning errors
    b. Actors: Quality Check Requester, Quality Check Performer, Object Store
    c. Discussion of Model for Quality Check Rules
        i. The proposal identifies four levels of Ruleset Visibility
        ii. Specification of actor internal behavior (business logic)
        iii. What body would be responsible for certifying "standard" Quality Check Rules?
        iv. Interoperability can be tested using obviously bad plans. Certification of Ruleset is a separable issue.
    d. How does one test?
    e. The Quality Check Requester Actor is a component of the last practical step in the treatment delivery chain that has plan information in DICOM.

f. Suggestion: Add paragraph indicating that the value of the safety check diminishes as you move away from treatment delivery.
    i. Check should be placed as close as practical to the actual treatment delivery.
    ii. Check *must* be performed at a point at which the treatment can be stopped.
g. Profile uses UPS Push capability (Quality Check Performer is SCP)
    i. This approach is expected to work well for QAPV; polling may be more appropriate for other (more asynchronous) quality checks, e.g., after-hours plan checks in a TMS.
    ii. UPS requires retrieval of plan from Object Store. Profile should make clear the importance of retrieval of the actual plan to be delivered.
    iii. Testing the QAPV requires that a failure occurs earlier in the TMS/TDD chain. This may be challenging to test.
    iv. Possible check results
        1. ERROR – check request invalid
        2. CANCELED – could not start check
        3. STARTED → … → CANCELED – could not complete check
        4. STARTED → … → COMPLETED / SUCCESS – check succeeded
        5. STARTED → … → COMPLETED / FAILED – check failed
    v. Review of UPS details for QAPV profile including Request SOP Instance UID, Priority, Input Readiness State, Object Store Location for retrieval of Quality Check input object(s)
    vi. QC Performer must implement UPS SCP
    vii. ACTION: Re-examine how Evaluation Status is communicated (should we use SR?).
h. Scheduled Work Item Code should be specified in the Profile, rather than in vendors' DICOM Conformance Statement.
i. Discussion of definition of Quality Check categories to allow specification of required input objects.
j. Need input from QA check vendors to identify RT Plan content requirements to enable Quality Check to be performed (is there more information required then currentlyin the ARTI Profile):
    i. Requirements for a *deliverable* RT Plan?
    ii. Requirements for a *checkable* RT Plan?

3. Results of discussion
    a. The parameters for plan evaluation are specified at the discretion of the Check Performer within the limits specified in the Profile. The Profile shall support the ability of the Quality Check Requester to issue a *simple* check request, i.e., with all necessary information pre-configured, to do the check.
    b. There may be other cases (at other phases of the workflow) where detailed parameter specification for the check may be useful e.g. TMS acting as a Quality Check Requester.
    c. It may be appropriate for some devices to receive a report of *why* checks passed or failed. There may also be cases where the Quality Check Requester only cares about the status.
        i. It shall be acceptable for the QCR to ignore the report details in this profile.
        ii. Minimum requirement for the QCP is to report success or failure in this profile.

d. Need to more explicitly specify *actions* of the Quality Check Requester for each of the possible results.
e. Note that SUCCESS does *not* mean that the plan is safe, only that no catastrophic error was detected.
f. We want to have the structure of transactions well-defined (even if they are not used in the current QAPV Profile) so they can support more detailed checks.

4. Review PC Use Case: "Pre-treatment Patient QA Checks" (5/4 afternoon)
   a. Classes of QA checks identified in Use Case:
      i. Data integrity check – Round-trip (TPS-TMS) plan comparison
      ii. Data sanity check – Plan correct for hardware? (e.g., jaw position incorrect for cone)
      iii. Clinical sanity check – Correct site / laterality / orientation?
      iv. Independent MU check – MU consistent with dose?
   b. Should the QCP perform checks (and report results) other than the ones specifically requested by the QCR? The QCP would need to report the *reason* for failure. Concern was expressed concerning the interpretation and response to reported evaluation results. Open-ended domain for quality check may place excessive burden of liability on QCP? → The working assumption for the QAPV profile is that only the explicitly requested check is to be performed. (This may be modified for later profiles.) Such an open-ended check would be requested with its own specific code.
   c. Identify inputs for each QA Check Class: (Notation used below: Patient data / *Configuration out-of-band*, [] indicates optional data)
      i. Data Integrity Check (bad data)
         1. Real-time Round-Trip plan comparison – It is not believed that this is a significant issue. Communication infrastructure safeguards are already in place.
            - Plan sent sent by x
            - Plan received received by y
         2. Reconstituted Round-Trip (TPS/TMS) plan comparison
            - Plan sent by x
            - Plan re-formed by y
            - *Rounding tolerance*
            - *Appropriate data filter (what differences are meaningful?)*
         3. Valid DICOM object
            - Plan
      ii. Data Sanity Check (plan is mal-formed or inconsistent with delivery device)
         1. Internal object consistency (e.g., counts match # items in sequences)
            - Plan
            - *DICOM semantic rules (generally not configurable)*
         2. Plan is consistent with TDD capability
            - Plan
            - *TDD Characterizations*
      iii. Clinical Sanity Check (can be delivered, but would harm patient)
         1. Clinically unacceptable plan
            - Plan

- Prescription (is it consistent with Plan)
- [SSet]
- [Images]
- *Clinical Rules*
- *Prescription Knowledge*

2. Inappropriate ROI
   - Structure Set
   - [Imaging]
   - *Clinical Rules*
3. Dose inconsistent for clinical treatment technique and/or fractionation
   - Plan
   - Prescription
   - *Clinical Rules*
   - *Prescription Knowledge*
4. Wrong Site
   - Plan
   - Imaging
   - Structure Set
   - [Prescription]
   - Human Review

iv. MU Checks (dose to reference point)

1. Dose inconsistent with simple patient model
   - Plan
   - *Beam Model*
   - *Rules*
2. Dose inconsistent with complex patient model
   - Plan
   - Imaging
   - Structure Set
   - [Dose]
   - *Beam Model*
   - *Rules*
   - *CT-ED Calc Table?*
   - *Calc Model?*

v. Clinical Logistics – A categorical solution is beyond the scope of this Use Case. Some problems can be mitigated by use of scheduled clinical workflow.

1. Wrong patient
2. Wrong plan
3. Wrong position
4. Wrong image data
5. Wrong beam data

d. QA Check Classes that the TC believes it has committed to

i. MU Check: Dose inconsistent with simple patient model.

5. Storage of Results of Secondary Check Results (Uli Busch)

a. DICOM WG-7 has proposed the use of the DICOM Structure Report mechanism for storing Secondary Check Results.

6. Discussion of weak QA Vendor involvement in QA Profile development and implementation (5/6/2011 @ 12:05pm)
   a. ACTION: Bruce to contact Gary Ezell (AAPM president) and suggest letter from AAPM leadership to QA vendors
   b. ACTION: Stuart to contact Stephen Vastagh (NEMA) regarding mini-course at AAPM aimed at vendors; e.g., joint invitation from Stephen Vastagh and Gary Ezell to a presentation on Patient Safety & Plan QA Check.
   c. It was noted that QA vendors may not have strong engineering support for DICOM workflow infrastructure (beyond file parsing).

E. Connectathon Timing Discussion (5/4/11 @ 11:30am) – move Connectathon earlier in the year (e.g., in spring) as a better match to (1) vendor release cycle and (2) ASTRO budget cycle (better for test tool procurement/development/testing process)?

1. Ideally, test tools ready ~6 months prior to Connectathon
2. Profile development is very rushed. Do we want to lengthen profile development cycle to 3 years?
3. Discussion of alternative IHE-RO annual meeting schedule:
   a. Connectathon (5 days) + Meeting (3-5 days) in Mar 15-30
   b. Domain Pre-Testing (3-5 days) + Meeting (3-5 days) in early Sept.
   c. ASTRO meeting (joint meeting with PC 2hrs) in early Oct to mid Nov
   d. Fall Meeting (5 days) in mid-Nov or early Dec
4. Profiles/Test-tool cycle
   a. Voted to public comment in early Dec
   b. Voted to trial implementation in Mar → send to RSNA for review
   c. Test tools RFP in Apr-May
   d. Test tools delivered Sep
5. Do both formal and informal testing twice a year?
   a. Requires announcement 9 months before and IHE approval 6 months before
   b. Concern regarding test partners for re-testing at *two* events per year.
6. Conclusions:
   a. General consensus is to move to this schedule, starting in 2013. Need to decide how to transition.
   b. Also a concern that Pre-testing would evolve to second full Connectathon.
   c. Action: Bruce to discuss with Sidrah and Barbara

Adjourn for the day 5/4/11 @ 5:50pm

F. IPDW (5/5/2011 @ 9:00am)

1. Review of Version 1.5 of Integrated Positioning and Delivery Workflow Integration Profile
   a. Imaging, Positioning, etc. workflow steps are *optional*. Location for storage of *results* of these steps is still under discussion. Multiple PS are placed In Progress by PDS. Order of execution is suggested by TMS, but controlled by PDS.
   b. Treat Step is *optional* to cover the "image only" case.
   c. The PDS must place *all* of the Worklist Steps for a treatment session In Progress.

2. Changes to profile since Jan 2011 TC meeting (see also Change History in Profile)
   a. Treat step is now optional
   b. Support for Conventional, Ion, Brachy modalities
   c. Check SOP class UIDs
   d. Split progress updates into (1) RO-26: UPS Progress Update for Treatment and (2) RO-xx UPS Progress Update for Non-Treatment Steps (n of m completed)
   e. Update Referenced Standard section since Supp 96 and Supp 74 are now FT.
   f. Completed table "Required SOP Class Support for Performing Device SCU" in case of radiation exposure for CT dose reporting (per REM profile)
   g. Removed "Required Input Sequence Content" to synchronize with TDW profile
   h. Clarify RO-19 that setting the UPS in progress means that the performing device takes ownership of PS. It does not mean that the activity of the step has been started.
3. Extended discussion of "Surrogate Plans" used for TDW Profile.
4. The issue of plan data becoming stale due to changes in machine characteristics or tuning parameters was discussed. How can the consistency of plans with the current characteristics of the delivery device be assured? This has implications for DICOM 2nd Gen RT (Radiation) IODs.
5. **ACTION:** (Uli) Post the differences of Supp 96 and 74 between versions used in TDW and FT version.
6. **ACTION:** (Uli) Incorporate the consistency checks for local plan storage identified in the June 8, 2010 Granada TC meeting (see "Appropriate Response to Error Conditions (Treatment Delivery Workflow) [6/8/2010 @ 10:15]" in meeting minutes) into the IPDW and DPDW profiles before these profiles are promoted to trial implementation status. These consistency checks are be performed between retrieved and cached plan data (and among retrieved object instances). → Text to be added to RT Plan Retrieval transaction.
7. The IPDW Profile does not restrict the number and content of steps to be performed in a treatment session.
   a. The profile supports inclusion of multiple, imaging, patient positioning, verification, and plan delivery steps. Some TMS allow only a single plan to be scheduled in a treatment session.
   b. Profile testing shall support the real-world capabilities of TMS and PDS Actors and demonstrate that clinically meaningful workflow steps can be scheduled and performed by these Actors. A TMS must support at least one of each clinically meaningful imaging, positioning, delivery mode of the PDS with which it is to inter-operate. (Capabilities of TMS and PDS are to be documented in their DICOM Conformance Statements.)
8. Discussion of unscheduled (*ad hoc* or implicit) procedures are currently out of scope for this profile. The profile does not restrict the behavior of the PDS, but only scheduled procedure steps can be reported.
   a. All scheduled worklist steps for a session must be displayed by the delivery device. This is implied by "R"/"R+" (no "*") requirements for attributes in Table 3.17-1 "Worklist Query for Positioning and Delivery" Query Key Return.
   b. The PDS could schedule an *ad hoc* procedure step on the TMS. The PDS might not be able to provide information regarding input data (e.g., reference images) used for with the procedure step, but this approach would support recording of the

procedure step and reference to images, etc. produced. This approach should be considered for the IPDW Profile.

c. ACTION: Uli to draft specification for *ad hoc* scheduling using N-Create.
d. Concern was expressed that adding this capability to the IPDW profile would add delays to its approval and implementation.

9. Uli reviewed changes to Profile text.
   a. DEPENDENCY: DICOM SOP Classes for RT Patient Positioning Instruction and Results IODs defined in the Patient Positioning Supplement being developed in WG-7 are expected to be available by end of 2011. <u>These are needed before the IPDW Profile can be approved for Trial Implementation.</u>
   b. Discussion of the storage location(s) for output objects produced by the PDS.
      i. There was general agreement that the *location(s)* of the output object store should be defined by the provider of the TMS Actor.
      ii. OPEN ISSUE: Is/are there one or multiple output object storage location(s)? Perhaps, one per SOP Class? Per Profile Transaction?
      iii. Solution Options discussed:
         1. All output objects are stored to the TMS. The TMS re-routes to additional stores
         2. Storage locations are specified per SOP Class
            - The TMS specifies one or more storage locations (per SOP Class) for output objects. (Specification is out of band for the profile.)
            - The PDS must be able to configure output locations (to agree with the TMS configuration) separately for each of the SOP Classes of output objects it produces.
      iv. ACTION: (Uli) Draft IPDW Profile text for both options outlined above.
10. IPDW Sample Conformance Statement (5/6/11 @ 12:00pm)
    a. Specifies what functionality a PDS provides and what Worklist Procedure Steps can be scheduled.
    b. Procedure-Step-Specific requirements for input information sequence content and expected output information sequence content.

G. DPDW (5/5/11 @ 4:15pm)

1. Uli reviewed the scope of the DPDW Profile and updates since the Jan 2011 TC meeting. Current version is 1.6.
2. A sub-group (Uli Busch, Christof Schadt, Norman Trapp, Andrea Morgan, Sanjay Bari, David Wikler, Michael Auger) is continuing to work on the supplement. Next meeting is scheduled for May 24. Uli will post Version 1.7 of the Supplement prior to this meeting (approx. May 18).

H. Old profiles (Bruce Curran, 5/5/2011 @ 4:25pm)

1. Basic Radiation Therapy Objects: Correction Proposal (cleanup). TF Revision 1.7
   a. Revision includes meeting the most current specifications for formatting of the TF, including Boilerplate.
   b. Volume 1 Content Corrections:
      i. Use of Retrieve vs. Retrieval in transaction names (made consistent). Basic Process Flow diagram needs to be redrawn to make Retrieve/Retrieval consistent in the diagram.

ii. Elimination of RO-9 (Dosimetric Plan Retrieval) from Dosimetric Planner Actor

c. Volume 2 Content Corrections:
   i. Use of Retrieve vs. Retrieval in transaction names (made consistent)
   ii. Listing of actors in a transaction no longer references the actor as being specific to a profile
   iii. Made use of bold and italics consistent (formatting/style consistency).
   iv. Typographic corrections. Grammatical corrections.
   v. ACTION: Bruce to publish the CP and resulting TF for Public Comment

2. Discussion of versioning:
   a. 1.7 for Basic RT Objects
   b. 2.x when including MM-RO
   c. we will skip 3 (it was a mess) and go to 4 when we have TDW supplement in final text
   d. After this, we will fold in Supplements when they reach final text
3. Discussion of ARTI
   a. Inconsistencies have been noted in this profile (differences between content of Vol. 1 and Vol. 2) 3 Comments/Change Proposal Requests on BBS
   b. Bruce and Sue Reilly did cleanup to make the supplement internally consistent
   c. Eight IHE Change Proposals (5 for Vol. 1, 3 for Vol. 2) to replace sections of the Supplement with corrected versions.
   d. "IHE_RO_Supplement_Advanced_RT_Objects_Interoperability-TFVol2_1.2.9-TI.xlsx" spreadsheet was reviewed.
   e. The defined terms for the High Dose Technique data element are NORMAL, HDR, and TBI. NORMAL is being deprecated by WG-7. ACTION: Add a note to indicate that the High-Dose Technique Type (300A,00C7) element should *not* be present for the NORMAL case.
   f. Use of Non-Standard Fluence Mode beams would require that the Primary Fluence Mode Sequence (3002,0050), which is currently Type 3, be mandatory in order to reliably mark beams as un-flattened beams. The Primary Fluence Mode Sequence (3002,0050) would need to be present (i.e., of type R) with
      i. Fluence Mode (3002,0051) = NON_STANDARD
      ii. Fluence Mode ID (3002,0052) = FFF (or some such)

      However, … making a required sequence *optional* (conditioned on an expectation that the delivery device supports Non-Standard Fluence Mode (FFF) delivery) is problematic.
   g. ACTION: Initiate a CP to add a "Fluence Mode Beam Modifier" option to those Beam Techniques appropriate. (This data element has an enumerated value of NON_STANDARD.) Need to explicitly list those Beam Techniques, for which NON_STANDARD Fluence Mode is known to be appropriate, and those for which it is known to be inappropriate.
   h. ACTION: Remove R+ for Source to Wedge Tray Distance (300A,00DA) for the Virtual Wedge Beam Technique.

Adjourn for the day May 5 @ 6:05pm
Resume 5/6 @ 8:20am

4. ARTI Discussion (continued) 5/6 @ 8:20am

a. Discussion of Beam Meterset attribute. ACTION: Add requirement of R+ for Beam Meterset (300A,0086) in all Beam Techniques
b. Discussion of display of attributes for a TMS Consumer Actor. Conclusion: there are no *graphic* (i.e., image) display requirements on TMS; however, numerical and text values must be displayed in a clinically useful form as required in the TMS application user interface.
c. Discussion of Patient Setup module (for fixed SSD). Conclusion: If data elements in the Patient Setup Module are required for a given Beam Technique, then the Patient Setup Module must be present for that Beam Technique.
d. A question regarding interpretation of Cumulative Meterset Weight in Plan CP sequence was discussed. It was noted that the values of Cumulative Meterset Weight are *cumulative* that increase monotonically from zero to the value of Final Cumulative Meterset Weight.

5. Extension of the ARTI Profile to cover sending of plans from a TMS Producer to a TDD Consumer. (Closes a gap identified by the PC.)
   a. Discussion of attribute requirements for "deliverable" and "QA-checkable" plans
   b. A TMS→TDD Profile needs to be a *new* profile. This profile needs transactions that, at minimum, need to include/correspond to ARTI transactions.
   c. Data object(s) required for QA checks must be specified *explicitly* in this profile.
   d. How to deal with Beam Technique Options in the new profile? What happens when the TDD supports an option, but the TMS does not? (Does this result in safe operation with reduced feature set?) Discussion of Bolus Option. DECISION: The Bolus, Block, Compensator, Fluence Mode Options would apply to the new profile.
   e. DECISION: This profile will *not* include a "Stub Plan" used for TDW Profile.
   f. DECISION: Include Treatment Record content requirements for TDD → TMS transactions.
   g. ACTION: report to PC that an advanced RT delivery and verification content profile appears to be feasible and request prioritization of development of this profile.
   h. ACTION: Specify content of Treatment Record for this new profile
6. Discussion of "Stub Plan" (i.e., "Scheduling Plan") *content* requirements for "plan-by-reference" in workflow profiles. Content requirements are expressed in IHE-RO TC Granada June 2010 minutes.
   a. Where should these requirements be specified? The new TMS→TDD Content Profile? Another new "minimum content" TPS→TMS→TDD profile?
      i. Concern was expressed that a "Stub Plan" profile might be abused for treatment techniques whose plan content is fully represented by TPS → TMS → TDS profiles.
      ii. DECISION:
         1. Actors: Define TDD-specific Producer and Consumer Actors (use 2nd gen radiation beam IODs for titles):
            - Helical-tomotherapy Delivery Device
            - Robotic-arm Delivery Device
            - Multi-source Device with Isocentric Focus
         2. Transactions: Store and Retrieve plans *and* treatment records

3. Content: Define minimal, well-formed DICOM conformant plans needed to safely reference plans locally stored on the TDD and record the treatment records needed to report delivery.

iii. ACTION: Draft proposal for presentation to PC at May 2011 meeting.

7. Summary of ARTI CPs:
   a. Bundled CPs to include changes for Dynamic wedge, High Dose Rate, Beam Meterset
   b. New CP for addition of requirement for Dose Reference Coefficient, Dose Reference Sequence
   c. New CP for addition of Fluence Mode Modifier Option

I. Logistics for Domain Pre-Testing
   1. Equipment set-up for Domain Pre-Test starting at 9:00am on Sat. 5/7/11
   2. Test data for ARTI with instances for each vendor
   3. Access to corridors restricted to entry-way and Elekta 9th floor meeting room.
   4. Stuart's mobile phone: +1-424-298-0099

J. Approval of MMR-RO Final Text (deferred)

K. Approval of TDW Final Text (5/6/2011 @ 1:00pm)
   1. Objection based on request to include RT Ion Plan delivery
      a. Would require CP to include Ion delivery as an option and make appropriate changes to include appropriate SOP Classes. This would create a substantial delay finalizing the TDW profile.
      b. Alternative is to wait for IPDW Profile.
   2. Motion to Approve TDW Profile as Final Text. Seconded. Approved unanimously by all voting members present. Will be folded into TF after review and after approval of CPs for current TF (Volume 1).

L. Misc
   1. Question regarding requirement for Dose Viewer Actor to import CT image series (5/6/2011 @ 1:15pm)
      a. Does this imply a requirement to accept non-uniformly spaced CT image planes?
      b. Decision: All Actors in the BRT Profile (including the Dose Viewer) *must* be capable of accepting non-uniformly spaced CT image planes.
      c. ACTION: (Bruce) Add clarification regarding non-uniform CT slice spacing to the appropriate CP for 2007 BRT profile. Also, clarify that the Use Case for Dosimetric Planner in Vol.1 does address treatment delivery or export to a treatment management system.

IHE-RO TC in recess as of 5/6 @ 1:45 pm

M. Follow up to Domain Pre-Testing (05/12: Half Day)
   1. Ways in which the Domain Pre-Testing could be improved
      a. Better adherence to planning instructions

b. More structured "dry-run" for connectathon?
c. Pre-configured/pre-loaded Archive? Standard patient names and IDs.
d. ACTION: Data sub-group (Walter, Rishabh, Stuart, Sanjay, Ashutosh) to investigate pre-loading testing archive for connectathon and pre-testing
    i. Pro-actively create *reference data set* for each profile for testing and test-tool development and validation
        1. ACTION: Bruce to establish a working group for each profile to provide test data sets (per-profile and with known variations)
        2. Dose Compositing: Rishabh, Koua, Christof, Walter
    ii. Requires more formal registration and commitments to test and possibly, use of Kudu to manage tests.
    iii. Patient ID convention: PROF YY {PC} NN VV
        1. PROF = profile
        2. YY = year
        3. {PC} = P (pre-testing) | C (connectathon)
        4. NN = dataset #
        5. VV = vendor/system code
e. Software version and re-testing discussion
    i. It is *inappropriate* to update and Integration Statement to a new version *without* re-testing.
f. Profiles expected to be tested in 2011 Connectathon:
    ARTI, TDW, BRT, MMRO, DC(?)

2. Discussion on Test Tools for 2011. Do we need them?
    a. Consensus recommendation: no new test tools until we have appropriate, valid test data sets.
    b. Establish working groups per profile to create test datasets (see above).
3. Minutes review.
    a. Create BBS thread for Rad Onc CT Sim Use Case: Done. Additional ACTION: Bruce to work with Farhana to reorganize BBS to add three new major threads for Meetings, Minutes, and Profiles
    b. Need to verify functionality of a URI to pull a non-DICOM Template file (noted as likely not a solution in later discussions) → ACTION: Bruce to refer question to WG-7 chair/vice-chair.
    c. Bruce to contact Gary Ezell (AAPM president) and suggest letter from AAPM leadership to QA vendors. Stuart to contact Stephen Vastagh (NEMA) regarding mini-course at AAPM aimed at vendors; e.g., joint invitation from Stephen Vastagh and Gary Ezell to a presentation on Patient Safety & Plan QA Check. Done. Patient Safety session planned for AAPM 2011 meeting.
    d. Discussion of alternative IHE-RO annual meeting schedule. ACTION: Bruce to discuss with Sidrah and Barbara
    e. IPDW: Imaging, Positioning, etc. workflow steps are *optional.* Location for storage of *results* of these steps is still under discussion..
    f. IPDW: The PDS could schedule an *ad hoc* procedure step on the TMS. The PDS might not be able to provide information regarding input data (e.g., reference images) used for with the procedure step, but this approach would support recording of the procedure step and reference to images, etc. produced. This approach should be considered for the IPDW Profile. ACTION: Uli to draft specification for *ad hoc* scheduling using N-Create.

g. IPDW: Storage location for output objects. OPEN ISSUE: Is/are there one or multiple output object storage location(s)? ACTION: (Uli) Draft IPDW Profile text for both options outlined above.
h. BRTO: Typographic corrections. Grammatical corrections. ACTION: Bruce to publish the CP and resulting TF for Public Comment
i. ARTI:
    i. ACTION: Add a note to indicate that the High-Dose Technique Type (300A,00C7) element should *not* be present for the NORMAL case.
    ii. ACTION: Initiate a CP to add a "Fluence Mode Beam Modifier" option to those Beam Techniques appropriate. (This data element has an enumerated value of NON_STANDARD.) Need to explicitly list those Beam Techniques, for which NON_STANDARD Fluence Mode is known to be appropriate, and those for which it is known to be inappropriate.
    iii. ACTION: Remove R+ for Source to Wedge Tray Distance (300A,00DA) for the Virtual Wedge Beam Technique.
    iv. ACTION: Add requirement of R+ for Beam Meterset (300A,0086) in all Beam Techniques
    v. Conclusion: there are no *graphic* (i.e., image) display requirements on TMS; however, numerical and text values must be displayed in a clinically useful form as required in the TMS application user interface.
    vi. Conclusion: If data elements in the Patient Setup Module are required for a given Beam Technique, then the Patient Setup Module must be present for that Beam Technique.
j. Extension of the ARTI Profile to cover sending of plans from a TMS Producer to a TDD Consumer. (Closes a gap identified by the PC.)
    i. ACTION: report to PC that an advanced RT delivery and verification content profile appears to be feasible and request prioritization of development of this profile.
    ii. ACTION: Specify content of Treatment Record for this new profile
k. TDW Profile approved as Final Text.
l. ACTION: (Bruce) Add clarification regarding non-uniform CT slice spacing to the appropriate CP for 2007 BRT profile. Also, clarify that the Use Case for Dosimetric Planner in Vol.1 does address treatment delivery or export to a treatment management system.

N. Other Business
1. IHE-RO Planning Committee Update – New Profiles
2. ASTRO / FDA – Possible role of IHE-RO in Regulatory Testing?

V. Face-to-face Meetings:

- **Connectathon 2011** – ASTRO HQ, Fairfax, VA, **Sept. 12-18, 2011**
    1. Setup Sept 12
    2. Testing Sept. 13-16
    3. TC meeting Sept 17-18 (ends noon on Sunday)
- **ASTRO 2011** (confirmed) – Miami, FL, Thurs 10/6/11 – Noon Sat 10/8/11
- **Domain Pre-Testing (May 2012)**

a. Emphasis on QAPV Profile
b. Venue in U.S. (tentatively, St. Louis)

- **Connectathon 2012 tentatively Sept 2012, ASTRO HQ**
- **Connectathon 2013 tentatively May 2013, ASTRO HQ**
- **Connectathon 2011** – ASTRO HQ, Fairfax, VA, **Sept. 12-18, 2011**

VI. IHE-RO Future Teleconferences:

1. Thursday, June 16, 1:00 – 2:30pm ET
   - Agenda: (a) Review QAPV, (b) Discuss AAPM developer session, (c) review results of PC Use Case prioritization
2. Thursday, July 21, 1:00 – 2:30pm ET
3. Thursday, August 18, 1:00 – 2:30pm ET

VII. Adjourn 5/12/11 @ 10:30