DICOM Correction Item

Correction Number CP-874	
Log Summary: Fixes for Radiation Dose Reporting	
Type of Modification Addition, Change	Name of Standard PS 3 2008

Rationale for Correction:

This CP collects several fixes for Radiation Dose Reporting.

1) Record in the Dose Report who ordered/justified the irradiation and who performed the irradiation.

Some Dose Management QA processes involve identification of the person with clinical responsibility for ordering the irradiating event, and/or identification of the person with technical control over adminstration of the irradiating event. This allows sites, for example, to identify when policies are not being followed and remind the relevant staff.

Create new template for Participating Persons to identify persons and their role.

Add optional content element to TID 10001 and TID 10011 for the physician responsible for irradiation (usually the ordering physician).

Add optional content element to TID 10003 and TID 10013 for the person administering the irradiation (usually the tech or interventionalist).

Note that these roles identify control/responsibility, not observers.

2) Improve Equipment Identification

Radiation QA processes have an interest in linking dose reports with specific equipment, e.g. to identify which systems are “running hotter” and figure out why (equipment config, operator practices, etc).

Create a new template for Participating Devices to identify devices and their role.

Add content items to TID 10003 and 10013 for the device which is producing/controlling the radiation.

Also add the Enhanced Equipment Module as mandatory to the Dose Report IOD. This module has been included in most new DICOM data objects. The module includes Type 1 attributes for manufacturer, model and serial number of the equipment which *generated the SR instance*. This may or may not be the irradiating modality so the TID 10003 and 10013 content elements are still necessary.

3) Require Target Region for Projection X-Ray

Target Region is already mandatory for the CT Template. It is a typical element of Dose QA processes to group/evaluate exposures.

Make Target Region mandatory in TID 10003.

Applications that don’t have more specific information may justify to their users the need to put a general code such as “Body”, or encourage the users to help select a more precise value. Some systems may derive the value from fields or procedure codes in the order.

4) Add QA/Phantom Flag for Dose Reports

This will be addressed in a separate CP.

5) Update TID 10001 to include Dosimetry Film reference

As part of their dose management process, some sites place a Dosimetery film under the patient (e.g. during an interventional procedure) and digitize the film into the study record. The film provides a simple form of dose mapping.

Added an optional reference to such a digitized dose image.

Since this image will often be scanned and the reference appended after the dose object is originally created, a bit of explanatory text is also added.

6) Fix Reference Point Definition handling

Reference Point Definition should be more consistently related to the “Dose at RP” fields it describes.

Reference Point Definition already appears in TID 10003 (where Dose at RP is used). Add Reference Point Definition to TID 10004 which is the other place Dose at RP appears. Remove Reference Point Definition from TID 10001 and TID 10002.

It is inconguous that Dose at RP is currently mandatory while RP can be undefined.

Make Reference Point Definition mandatory in TID 10003 and TID 10004.

IEC and FDA have defined a (small) set of standard reference points.

Add a Reference Point attribute that uses codes from an extensible list as an alternative to the free text.

FDA may extend their current fluoroscopy focused list when they consider radiography, in which case additional codes can be added to the context group.

7) Make optional some attributes that might impede implementation

Facilitate deployment of Dose Reporting by identifying any attributes that might impede implementation which could reasonably be made optional

Make Calibration Container conditional on calibration data being available.

Calibration information might be managed by a system other than the modality. If the modality doesn’t know and if this were mandatory, the modality would be unable to produce a dose object. DR/CR may be even less likely to have this readily available.

8) Clarify generation of Dose SR based on contents of an MPPS.

Three change proposals were submitted, all of which acknowledged SR Dose Reports as the preferred method for Dose storage.

The following changes are proposed as sufficient for MPPS solutions to be adapted to the SR approach:

Add Source of Dose Information to TID(10001) with DCID = Modality, Manual Entry, MPPS, Dosimeter

Allow Acquisition Plane to have a value of All Planes.

Make the following four attributes Conditional – Required IF Source is not MPPS; may be present otherwise

Dose (RP)	[TID 10003]
Fluoro Dose (RP) Total	[TID 10004]
Acquisition Dose (RP) Total	[TID 10004]

No attempt to perform parallel maintenance on MPPS dose module attributes will be made.

Retirement of dose related attributes from MPPS is not discussed here.

9) Remove restriction on intra-procedure dose reporting

Current Scope of Accumulation text effectively prevents a system from transmitting an irradiation event prior to completion of a procedure step, e.g. “realtime” as an interventional XA proceeds.

Add “Irradiation Event” to CID 10000 and “Irradiation Event UID” to CID 10001

This facilitates such reporting but does not mandate that a modality do so.

Discussions indicate that this capability will be useful in the future for advanced dose analysis, but will typically not be used today.

10) Directly support selection/retrieval of Dose Reports for a specific modality.

Rejected.

The Modality attribute in the Dose object will always be SR.

Template ID allows differentiation between CT reports and Everything Else reports.

Modalities in Study should usually allow identification of the irradiating modality prior to retrieving/parsing all the dose objects. In some studies, multiple irradiating modalities may be listed, but even if an unnecessary study is retrieved, it will generally only be a few dose objects and easily filtered on the client side.

11) Add Indication for whether it’s an interventional procedure

Radiation QA processes and policies (when totaling, analyzing or managing dose) may want to separate procedures where interventions were performed/attempted from procedures that were purely diagnostic.

Add “Has Intent” Modifier to the Procedure Reported in TID 10001, TID 10011 and reference CID (3629) Procedure Intent which has codes for Interventional and Diagnostic.

Sections of documents affected PS 3.3 A.35.8.3 PS 3.16 Annex A and D
Correction Wording: <include proposed change below, following guidelines for formatting of changes in supplements>

Add the Enhanced General Equipment Module to Table A.35.8-1 in Part 3

Update "the huge module table" to indicate the Enhanced General Equipment Module is mandatory in Dose Report objects.

A.35.8.3 X-Ray Radiation Dose SR IOD Module Table

Table A.35.8-1
X-RAY RADIATION DOSE SR IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	Clinical Trial Subject	C.7.1.3	U
Study	General Study	C.7.2.1	M
	Patient Study	C.7.2.2	U
	Clinical Trial Study	C.7.2.3	U
Series	SR Document Series	C.17.1	M
	Clinical Trial Series	C.7.3.2	U
Frame of Reference	Synchronization	C.7.4.2	C - shall be present if system time is synchronized to an external reference. May be present otherwise.
Equipment	General Equipment	C.7.5.1	M
	Enhanced General Equipment	**C.7.5.2**	**M**
Document	SR Document General	C.17.2	M
	SR Document Content	C.17.3	M
	SOP Common	C.12.1	M

Modify the following text in Annex A in Part 16

TID 10001
PROJECTION X-RAY RADIATION DOSE
Type: Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (113701, DCM, "X-Ray Radiation Dose Report")	1	M		
2	>	HAS CONCEPT MOD	CODE	EV (121058, DCM, "Procedure reported")	1	M		DT (113704, DCM, "Projection X-Ray") DT (P5-40010, SRT, "Mammography")
3	**>>**	**HAS CONCEPT MOD**	**CODE**	**EV (G-C0E8, SRT, "Has Intent")**	**1**	**M**		**DCID (3629) Procedure Intent**
~~43~~	>		INCLUDE	DTID (1002) Observer Context	1-n	M		
~~54~~	>	HAS OBS CONTEXT	CODE	EV (113705, DCM, "Scope of Accumulation")	1	M		DCID (10000) Scope of Accumulation
~~65~~	>>	HAS PROPERTIES	UIDREF	DCID (10001) UID Types	1	M		
~~6~~	**~~>~~**	**~~CONTAINS~~**	**~~TEXT~~**	**~~EV (113780, DCM, "Reference Point Definition")~~**	**~~1~~**	**~~U~~**		
7	>	CONTAINS	INCLUDE	DTID (10002) Accumulated X-Ray Dose	1	MC	IFF Single Plane system or (Biplane system and all planes are accumulated)	$Plane = EV (113622, DCM, "Single Plane" or EV (113890, DCM, "All Planes")
8	>	CONTAINS	INCLUDE	DTID (10002) Accumulated X-Ray Dose	1	MC	IFF Biplane system and planes are accumulated separately	$Plane = EV (113620, DCM, "Plane A")
9	>	CONTAINS	INCLUDE	DTID (10002) Accumulated X-Ray Dose	1	MC	IFF Biplane system and planes are accumulated separately	$Plane = EV (113621, DCM, "Plane B")
10	>	CONTAINS	INCLUDE	DTID (10003) Irradiation Event X-Ray Data	1-n	M		
11	>	CONTAINS	TEXT	EV (121106, DCM, "Comment")	1	U		
12	**>**	**CONTAINS**	**IMAGE**	**EV (121342, DCM, "Dose Image")**	**1-n**	**U**		
13	**>**	**CONTAINS**	**INCLUDE**	**DTID (1020) Person Participant**	**1**	**U**		**$PersonProcedureRole= EV (113850, DCM, "Irradiation Authorizing")**
14	**>**	**CONTAINS**	**CODE**	**EV (113854, DCM, "Source of Dose Information")**	**1-n**	**M**		**DCID (10020) Source of Projection X-Ray Dose Information**

Content Item Descriptions

Row **~~43~~**	The observer context may include both a Person Observer identification, as well as the identity of the equipment providing the values for the irradiation event (Device Observer identification), if not inherited.
~~Row 6~~	**~~This item defines the Reference Point (RP) used for RP-related dose values. The RP may be defined according to IEC 60601-2-43, or may use an implementation-specific definition. A typical~~**

	~~reference point for digital mammography is: "Entrance exposure to a 4.2 cm breast thickness".~~
Row 10	Details of the underlying irradiation events. If Row 6 has a value of "MPPS Content" then a TID 10003 item will be generated for each item in the MPPS Exposure Dose Sequence (0040,030E).
Row 12	The Dose Image references a graphic representation of the radiation dose distribution. This may be a Secondary Capture scan of a dosimetry film.
Row 13	The physician responsible for determining that the irradiating procedure was appropriate for the indications. The value may come from Requesting Physician (0032,1032), Requesting Physician Identification Sequence (0032,1031) or somewhere else based on hospital policies.
Row 14	The primary source of information from which this dose object was constructed.

TID 10002 Accumulated X-Ray Dose

This general template provides detailed information on projection X-Ray dose value accumulations over several irradiation events from the same equipment (typically a study or a performed procedure step).

Parameter Name	Parameter Usage
$Plane	Coded term identifying to which acquisition plane the encoded information belongs.

TID 10002
ACCUMULATED X-RAY DOSE
Type: Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (113702, DCM, "Accumulated X-Ray Dose Data")	1	M		
2	>	HAS CONCEPT MOD	CODE	EV (113764, DCM, "Acquisition Plane"	1	M		$Plane
~~3~~	~~>~~	~~CONTAINS~~	~~TEXT~~	~~EV (113780, DCM, "Reference Point Definition")~~	~~1~~	~~U~~		
3~~4~~	>	CONTAINS	CONTAINER	EV (122505, DCM, "Calibration")	1	MC	IFF Calibration Data is available	
4~~5~~	>>	HAS CONCEPT MOD	CODE	EV (113794, DCM, "Dose Measurement Device")	1-n	M		DCID (10010) Dose Measurement Devices
5~~6~~	>>	CONTAINS	DATETIME	EV (113723, DCM, "Calibration Date")	1	M		
6~~7~~	>>	CONTAINS	NUM	EV (122322, DCM, "Calibration Factor")	1	M		Units = EV (1, UCUM, "no units")
7~~8~~	>>	CONTAINS	NUM	EV (113763, DCM, "Calibration Uncertainty")	1	M		Units = EV (%, UCUM, "Percent")
8~~9~~	>>	CONTAINS	TEXT	EV (113724, DCM, "Calibration Responsible Party")	1	M		
9~~1~~ 0	>	CONTAINS	INCLUDE	DTID (10004) Accumulated Projection X-Ray Dose	1	MC	XOR row 11, IFF TID (10001) Row 2 = (113704, DCM, "Projection X-Ray")	
10 ~~11~~	>	CONTAINS	INCLUDE	DTID (10005) Accumulated	1	MC	XOR row 10, IFF TID (10001) Row 2 = (P5-	

				Mammography X-Ray Dose			40010, SRT, "Mammography")	

Content Item Descriptions

~~**Row 3**~~	~~**Reference Point definition if not provided in TID 10001. A typical reference point for digital mammography is: "Entrance exposure to a 4.2 cm breast thickness".**~~
Row **5**~~**4**~~	Date that the calibration of the equipment's dose indicators was performed
Row **6**~~**7**~~	Factor by which the measured dose area product total was multiplied to obtain the Dose Area Product Total (Row 10).
Row 7~~**8**~~	Value range from 0 to 100 percent. Uncertainty of the 'actual' value expressed as +/- of the mean.
Row **8**~~**9**~~	Identifies Individual or organization responsible for calibration

TID 10003 Irradiation Event X-Ray Data

This template conveys the dose and equipment parameters of a single irradiation event.

An irradiation event is the occurrence of radiation being applied to a patient in **a** single continuous time-frame between the start (release) and the stop (cease) of the irradiation. The irradiation event is the "smallest" information entity to be recorded in the realm of Radiation Dose reporting. Individual Irradiation Events are described by a set of accompanying physical parameters that are sufficient to understand the "quality" of irradiation that is being applied. This set of parameters may be different for the various types of equipment that are able to create irradiation events. Any **automatic** on-off switching of the irradiation source during the event shall not be treated as separate events, rather the event includes the time between start and stop of irradiation as triggered by the user. E.g., a pulsed fluoro X-Ray acquisition shall be treated as a single irradiation event.

As described in Section 6.2.4, measurement concepts may be post-coordinated, even though not explicitly specified in the Template. In particular, post-coordination using modifier concept (121401, DCM, "Derivation"), with modifier values drawn from CID 10009 Measured/Calculated would be appropriate to encode indications of measured or of calculated values.

TID 10003
IRRADIATION EVENT X-RAY DATA
Type: Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (113706, DCM, "Irradiation Event X-Ray Data")	1	M		
2	>	HAS CONCEPT MOD	CODE	EV (113764, DCM, "Acquisition Plane")	1	M		DCID (10003) Equipment Plane Identification
3	>	CONTAINS	CODE	EV (113721, DCM, "Irradiation Event Type")	1	M		DCID (10002) Irradiation Event Types
4	>	CONTAINS	TEXT	EV (125203, DCM, "Acquisition Protocol")	1	U		
5	>	CONTAINS	CODE	EV (T-D0005, SRT, "Anatomical structure")	1	U		
6	>>	HAS CONCEPT MOD	CODE	EV (G-C171, SRT, "Laterality")	1	UC	If anatomy is bi-lateral	DCID (244) Laterality

7	>	CONTAINS	**TEXT**	EV (113780, DCM, “Reference Point Definition”)	1	~~U~~ **MC**	**IF Row 12 or Row 13 is present and Row 8 is not present**	
8	**>**	**CONTAINS**	**CODE**	**EV (113780, DCM, “Reference Point Definition”)**	**1**	~~U~~ **MC**	**IF Row 12 or Row 13 is present and Row 7 is not present**	**DCID (10025) Radiation Dose Reference Points**
~~8~~	~~>~~	~~CONTAINS~~	~~IMAGE~~	~~EV (113795, DCM, “Acquired Image”)~~	~~1 n~~	~~MC~~	~~IFF Image Object is created for this irradiation event~~	
9	>	CONTAINS	UIDREF	EV (113769, DCM, “Irradiation Event UID”)	1	M		
10	>	CONTAINS	NUM	EV (122130, DCM, “Dose Area Product”	1	MC	~~XOR Row 11,~~ IFF TID (10001) Row 2 = (113704, DCM, “Projection X-Ray”)	Units = EV (Gym2, UCUM, "Gym2")
11	>	CONTAINS	NUM	EV (111631, DCM, “Average Glandular Dose”)	1	MC	~~XOR Row 10,~~IFF TID (10001) Row 2 = (P5-40010, SRT, “Mammography”)	Units = EV (dGy, UCUM, “dGy”
12	>	CONTAINS	NUM	EV (113738, DCM, “Dose (RP)”)	1	MC	~~XOR Row 13,~~ IFF TID (10001) Row 2 = (113704, DCM, “Projection X-Ray”) **AND any of the values of TID (10001) Row 14 are not (113858, DCM, “MPPS Content”).**	Units = EV (Gy, UCUM, “Gy”)
13	>	CONTAINS	NUM	EV (111636, DCM, “Entrance Exposure at RP”)	1	MC	~~XOR Row 12,~~IFF TID (10001) Row 2 = (P5-40010, SRT, “Mammography”)	Units = EV (mGy, UCUM, “mGy”)
14	>	CONTAINS	NUM	EV (112011, DCM, “Positioner Primary Angle”)	1	UC	XOR Row 18	Units = EV (deg, UCUM, “°”)
15	>	CONTAINS	NUM	EV (112012, DCM, “Positioner Secondary Angle”)	1	UC	XOR Row 18	Units = EV (deg, UCUM, “°”)
16	>	CONTAINS	NUM	EV (113739, DCM, “Positioner Primary End Angle”**)**	1	UC	IFF Row 3 value = (113613, DCM, “Rotational Acquisition”)	Units = EV (deg, UCUM, “°”)
17	>	CONTAINS	NUM	EV (113740, DCM, “Positioner Secondary End Angle”**)**	1	UC	IFF Row 3 value = (113613, DCM, “Rotational Acquisition”)	Units = EV (deg, UCUM, “°”)
18	>	CONTAINS	NUM	EV (113770, DCM, “Column Angulation”)	1	UC	XOR Rows 14,15	Units = EV (deg, UCUM, “°”)
19	>	CONTAINS	NUM	EV (113790, DCM, “Collimated Field Area”	1	U		Units = EV (m2, UCUM, “m^2”)
20	>	CONTAINS	CONTAINER	EV (113771, DCM, “X-Ray Filters”)	1-n	U		
21	>>	CONTAINS	CODE	EV (113772, DCM, “X-Ray Filter Type”)	1	U		DCID (10007) X-Ray Filter Types
22	>>	CONTAINS	CODE	EV (113757, DCM, “X-Ray Filter Material”)	1	U		DCID (10006) X-Ray Filter Materials
23	>>	CONTAINS	NUM	EV (113758, DCM, “X-Ray Filter Thickness Minimum”)	1	U		Units = EV (mm, UCUM, “mm”)
24	>>	CONTAINS	NUM	EV (113773, DCM, “X-Ray Filter	1	U		Units = EV (mm, UCUM,

				Thickness Maximum")				"mm")
25	>	CONTAINS	CODE	EV (113732, DCM, "Fluoro Mode")	1	UC	IFF Row 3 value = (P5-06000, SRT, "Fluoroscopy")	DCID (10004) Fluoro Modes
26	>	CONTAINS	NUM	EV (113791, DCM, "Pulse Rate")	1	MC	IFF Row 25 value = (113631, DCM, "Pulsed")	Units = EV ({pulse}/s, UCUM, "pulse/s")
27	>	CONTAINS	NUM	EV (113768, DCM, "Number of Pulses")	1	M**C**	**IFF Row 25 value = (113631, DCM, "Pulsed")**	Units = EV (1, UCUM, "no units")
28	>>	HAS CONCEPT MOD	CODE	EV (121401, DCM, "Derivation")	1	MC	IFF count of pulses in Row 27 is estimated	EV (R-10260, SRT, "Estimated")
29	>	CONTAINS	NUM	EV (113733, DCM, "KVP")	1-n	U		Units = EV (kV, UCUM, "kV")
30	>	CONTAINS	NUM	EV (113734, DCM, "X-Ray Tube Current")	1-n	U		Units = EV (mA, UCUM, "mA")
31	>	CONTAINS	NUM	EV (113735, DCM, "Exposure Time")	1	U		Units = EV (ms, UCUM, "ms")
32	>	CONTAINS	NUM	EV (113793, DCM, "Pulse Width")	1-n	U		Units = EV (ms, UCUM, "ms")
33	>	CONTAINS	NUM	EV (113736, DCM, "Exposure")	1-n	U		Units = EV (uAs, UCUM, "uAs")
34	>	CONTAINS	NUM	EV (113766, DCM, "Focal Spot Size")	1	U		Units = EV (mm, UCUM, "mm")
35	>	CONTAINS	NUM	EV (113742, DCM, "Irradiation Duration")	1	U		Units = EV (s, UCUM, "s")
36	>	CONTAINS	NUM	EV (113767, DCM, "Average X-Ray Tube Current")	1	U		Units = EV (mA, UCUM, "mA")
37	>	CONTAINS	CODE	EV (113745, DCM, "Patient Table Relationship")	1	U		DCID (21) Patient Gantry Relationship
38	>	CONTAINS	CODE	EV (113743, DCM, "Patient Orientation")	1	U		DCID (19) Patient Orientation
39	>>	HAS CONCEPT MOD	CODE	EV (113744, DCM, "Patient Orientation Modifier")	1	M		DCID (20) Patient Orientation Modifier
40	>	CONTAINS	NUM	DCID (10008) Dose Related Distance Measurements	1-n	U		Units = EV (mm, UCUM, "mm")
41	>	CONTAINS	NUM	EV (113754, DCM, "Table Head Tilt Angle")	1	U		Units = EV (deg, UCUM, "°")
42	>	CONTAINS	NUM	EV (113755, DCM, "Table Horizontal Rotation Angle")	1	U		Units = EV (deg, UCUM, "°")
43	>	CONTAINS	NUM	EV (113756, DCM, "Table Cradle Tilt Angle")	1	U		Units = EV (deg, UCUM, "°")
44	>	CONTAINS	CODE	EV (123014-, DCM, ("Target Region")	1	~~U~~ **M**		DCID (4031) Common Anatomic Regions
45	>	CONTAINS	CODE	EV (111632, DCM, "Anode Target Material"	1	U		DCID (10016) Anode Target Material
46	>	CONTAINS	NUM	EV (111633, DCM, "Compression Thickness")	1	U		Units = (mm, UCUM, "millimeter")

47	>	CONTAINS	NUM	EV (111634, DCM, "Half Value Layer")	1	U		Units = (mm, UCUM, "millimeter")
48	>	CONTAINS	CODE	EV (111635, **DCM,** "X-Ray Grid")	1-n	U		DCID (10017) X-Ray Grid
49	>	CONTAINS	CODE	EV (F-01710, SRT, "Breast composition")	1	U		DCID (6000) Overall Breast Composition
50	>	CONTAINS	TEXT	EV (121106, DCM, "Comment")	1	U		
51	**>**	**CONTAINS**	**INCLUDE**	**DTID (1020) Person Participant**	**1-n**	**U**		**$PersonProcedureRole = EV (113851, DCM, "Irradiation Administering")**
52	**>**	**CONTAINS**	**INCLUDE**	**DTID (1021) Device Participant**	**1**	**M**		**$DeviceProcedureRole = EV (113859, DCM, "Irradiating Device")**
53	**>**	**CONTAINS**	**IMAGE**	**EV (113795, DCM, "Acquired Image")**	**1-n**	**MC**	**IFF Image Object is created for this irradiation event**	

Content Item Descriptions

Row 7	**A text definition of the Reference Point (RP) used for RP-related dose values. ~~Reference Point definition if not provided in TID 10001. A typical reference point for digital mammography is: "Entrance exposure to a 4.2-cm breast thickness".~~**
Row 8	**A coded definition of the Reference Point (RP) used for RP-related dose values. ~~Reference to Image instances created during this event, if any. The UID reference(s) provided here shall be the values at the time the images were initially created. (Note that image UIDs may be changed as the images are managed over a long term.)~~**
Row 9	If the image generating entity does not assign a DICOM UID to the irradiation event (e.g., for non-digital imaging equipment), the application generating this report shall assign a UID.
Row 12	Dose applied by this irradiation event, relative to defined reference point.
Row 14	Angle in patient's "equatorial" plane (LAO to RAO). For dynamically changing angle during the event, the start value shall be provided. Equivalent to (0018,1510) in an image instance.
Row 15	Angle in patient's "sagittal" plane (CRAN to CAUD). For dynamically changing angle during the event, the start value shall be provided. Equivalent to (0018,1511) in an image instance.
Row 16	In case of motion during irradiation event, Positioner Primary ending angle
Row 17	In case of motion during irradiation event., Positioner Secondary ending angle
Row 18	Column device Angle in equipment based coordinates
Row 19	Collimated area at the receptor plane.
Row 20	If one or more Filter(s) were applied during this irradiation event
Row 27	If a precise count of pulses is not available, an estimated number shall be provided, and the Row **~~24~~28** Concept Modifier shall indicate "Estimated"
Row 29	KVP value as measured/recorded by system, either as a single mean value, or as multiple values. If multiple values are provided, their number shall match the value in Row 2**~~3~~7** "Number of Pulses".
Row30	Tube current as measured/recorded by system, either as a single mean value, or as multiple values. If multiple values are provided, their number shall match the value in Row 2**~~3~~7** "Number of Pulses".
Row 31	Exposure time as measured/recorded by the system.
Row 32	Pulse width as measured/recorded by the system, either as a single total value, or as multiple values. If multiple values are provided, their number shall match the value in Row 2**~~3~~7** "Number of Pulses".
Row 33	Exposure as measured/recorded by system, either as a single total value, or as multiple values. If multiple values are provided, their number shall match the value in Row 2**~~3~~7** "Number of Pulses". The Exposure will be affected by the shape of the pulse and other factors, and may not be a simple multiplication of tube current and exposure time.
Row 44	The target region is the anatomy exposed.
Row 51	**People responsible for the administration of the radiation reported in the irradiation event. May include values which would appear in Performing Physicians' Name (0008,1050), Performing Physician Identification Sequence (0008,1052), Operators' Name (0008,1070) and/or Operator**

	Identification Sequence (0008,1072).
Row 52	**The device which produced the irradiation in this Irradiation Event. I.e. the X-Ray source.**
Row 53	**Reference to Image instances created during this event, if any. The UID reference(s) provided here shall be the values at the time the images were initially created. (Note that image UIDs may be changed as the images are managed over a long term.)**

TID 10004 Accumulated Projection X-Ray Dose

This general template provides detailed information on projection X-Ray dose value accumulations over several irradiation events from the same equipment (typically a study or a performed procedure step).

TID 10004
ACCUMULATED PROJECTION X-RAY DOSE
Type: Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			NUM	EV (113722, DCM, "Dose Area Product Total")	1	M		Units = EV (Gym2, UCUM, "Gym2")
2			NUM	EV (113725, DCM, "Dose (RP) Total")	1	M**C**	**IF any of the values of TID (10001) Row 14 are not (113858, DCM, "MPPS Content"). May be present otherwise.**	Units = EV (Gy, UCUM, "Gy")
3			NUM	EV (113726, DCM, "Fluoro Dose Area Product Total")	1	MC	IFF TID (10003) Row 3 value = (P5-06000, SRT, "Fluoroscopy") for at least one irradiation event	Units = EV (Gym2, UCUM, "Gym2")
4			NUM	EV (113728, DCM, "Fluoro Dose (RP) Total")	1	MC	IFF TID (10003) Row 3 value = (P5-06000, SRT, "Fluoroscopy") for at least one irradiation event **AND any of the values of TID (10001) Row 14 are not (113858, DCM, "MPPS Content").**	Units = EV (Gy, UCUM, "Gy")
5			NUM	EV (113730, DCM, "Total Fluoro Time")	1	MC	IFF TID (10003) Row 3 value = (P5-06000, SRT, "Fluoroscopy") for at least one irradiation event.	Units = EV (s, UCUM, "s")
6			NUM	EV (113727, DCM, "Acquisition Dose Area Product Total")	1	M		Units = EV (Gym2, UCUM, "Gym2")
7			NUM	EV (113729, DCM, "Acquisition Dose (RP) Total")	1	M**C**	**IF any of the values of TID (10001) Row 14 are not (113858, DCM, "MPPS Content"). May be present otherwise.**	Units = EV (Gy, UCUM, "Gy")
8			**NUM**	**EV (113855, DCM, "Total Acquisition Time")**	**1**	**M**		**Units = EV (s, UCUM, "s")**
~~8~~**9**			NUM	EV (113731, DCM, "Total Number of Radiographic Frames")	1	U		Units = EV (1, UCUM, "no units")
10			**CODE**	**EV (113780, DCM, "Reference Point Definition")**	**1**	**MC**	**IF Row 2, Row 4 or Row 7 is present and Row 11 is not present.**	**DCID (10025) Radiation Dose Reference Points**

11			**TEXT**	**EV (113780, DCM, "Reference Point Definition")**	**1**	**MC**	**IF Row 2, Row 4 or Row 7 is present and Row 10 is not present.**	

Content Item Descriptions

TID

Row 1	Sum of acquisition and fluoroscopy
Row 2	Sum of acquisition and fluoroscopy, relative to reference point.
Rows 3-5	Fluoroscopic component only
Rows 6-~~7~~**8**	Acquisition component only
Row 10	**A coded definition of the Reference Point (RP) used for RP-related dose values.**
Row 11	**A text definition of the Reference Point (RP) used for RP-related dose values.**

10011
CT RADIATION DOSE
Type: Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (113701, DCM, "X-ray Radiation Dose Report")	1	M		
2	>	HAS CONCEPT MOD	CODE	EV (121058, DCM, "Procedure reported")	1	M		EV (P5-08000, SRT, "Computed Tomography X-ray")
3	**>>**	**HAS CONCEPT MOD**	**CODE**	**EV (G-C0E8, SRT, "Has Intent")**	**1**	**M**		**DCID (3629) Procedure Intent**
~~4~~3	>		INCLUDE	DTID (1002) Observer Context	1-n	M		
~~5~~4	>	HAS OBS CONTEXT	DATETIME	EV (113809, DCM, "Start of X-ray Irradiation")	1	M		
~~6~~5	>	HAS OBS CONTEXT	DATETIME	EV (113810, DCM, "End of X-ray Irradiation")	1	M		
~~7~~6	>	HAS OBS CONTEXT	CODE	EV (113705, DCM, "Scope of Accumulation")	1	M		DCID (10000) Scope of Accumulation
~~8~~7	>>	HAS PROPERTIES	UIDREF	DCID (10001) UID Types	1	M		
~~9~~8	>	CONTAINS	INCLUDE	DTID (10012) CT Accumulated Dose Data	1	M		
10~~9~~	>	CONTAINS	INCLUDE	DTID (10013) CT Irradiation Event Data	1-n	M		
11~~1~~0	>	CONTAINS	TEXT	EV (121106, DCM, "Comment")	1	U		
12	**>**	**CONTAINS**	**CODE**	**EV (113854, DCM, "Source of Dose Information")**	**1-n**	**M**		**DCID (10021) Source of CT Dose Information**
13	**>**	**CONTAINS**	**INCLUDE**	**DTID (1020) Person Participant**	**1**	**U**		**$PersonProcedureRole = EV (113850, DCM, "Irradiation Authorizing")**

Content Item Descriptions

Row **43**	The observer context may include both a Person Observer identification, as well as the identity of the equipment providing the values for the irradiation event (Device Observer identification), if not inherited.
Row **54**	Start, Date Time of the first CT Irradiation Event of the accumulation
Row **65**	End, Date Time of the last CT Irradiation Event of the accumulation
Row 11	**The primary source of information from which this dose object was constructed.**
Row 12	**The physician responsible for determining that the irradiating procedure was appropriate for the indications. The value may come from Requesting Physician (0032,1032), Requesting Physician Identification Sequence (0032,1031) or somewhere else based on hospital policies.**

TID 10012 CT Accumulated Dose Data

This general template provides detailed information on CT X-ray dose value accumulations over several irradiation events from the same equipment and over the scope of accumulation specified for the report (typically a Study or a Performed Procedure Step).

TID 10012
CT ACCUMULATED DOSE DATA
Type: Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (113811, DCM, "CT Accumulated Dose Data")	1	M		
2	>	CONTAINS	NUM	EV (113812, DCM, "Total Number of Irradiation Events")	1	M		Units = EV ({events} UCUM, "events")
3	>	CONTAINS	NUM	EV (113813, DCM, "CT Dose Length Product Total")	1	M		Units = EV (mGycm, UCUM, "mGycm")
4	>	CONTAINS	NUM	EV (113814, DCM, "CT Effective Dose Total")	1	U		Units = EV (mSv, UCUM, "mSv")
5	>>	HAS PROPERTIES	TEXT	EV (121406, DCM, "Reference Authority")	1	MC	XOR row 6	
6	>>	HAS PROPERTIES	CODE	EV (121406, DCM, "Reference Authority")	1	MC	XOR row 5	DCID (10015) CT Dose Reference Authority
7	>>	HAS CONCEPT MOD	CODE	EV (G-C036, SRT, "Measurement Method")	1	M		DCID (10011) Effective Dose Evaluation Method
8	>>	HAS PROPERTIES	TEXT	EV (113815, DCM, "Patient Model")	1	MC	IF the value of row 7 equals (113800, DCM, "DLP to E conversion via MC computation") or equals (113801, DCM, "CTDIfreeair to E conversion via MC computation")	

9	>>	HAS PROPERTIES	CONTAINER	EV (113816, DCM, “Condition Effective Dose measured”)	1	MC	IF the value of row 7 equals (113802, DCM, “DLP to E conversion via measurement”) or equals (113803, DCM, “CTDIfreeair to E conversion via measurement”)	
10	>>>	CONTAINS	TEXT	EV (113817, DCM, “Effective Dose Phantom Type”)	1	M		
11	>>>	CONTAINS	TEXT	EV (113818, DCM, “Dosimeter Type”)	1	M		
12	>	CONTAINS	TEXT	EV (121106, DCM, “Comment”)	1	U		

Content Item Descriptions

Row 2	Total Number of CT irradiation events-. A CT irradiation event is one continuous irradiation procedure and is defined through consistent acquisition parameters. In the case of dose modulation the calculations are based on the effective parameters (e.g. the effective mA recorded in the Mean X-ray Tube Current), and these acquisition parameters are consistent.
Row 3	The Dose Length Product (DLP) is calculated for every irradiation event. The Dose Length Product Total is the sum of the DLP values. The calculation is based on the $CTDI_{vol}$ result of each irradiation event.
Row 4	Effective dose (E, in units of mSv) evaluated as a total over the scope is defined in Row 6 of template TID 10011. Effective dose is defined by the reference in Rows 5 or 6 of this template. It may be calculated from a product of DLP and an ‘Effective Dose Conversion Factor’ (E/DLP). Or it may be calculated from a product of the Mean CTDIfree air and the ratio E/CTDIfree air. The ratios E/DLP or E/CTDIfree air may be evaluated either from computer simulations applying Monte Carlo (MC) sampling techniques or from dosimetric measurements in an anthropomorphic phantom, e.g., the Alderson-Rando phantom.. The specific method used is identified in Rows 7 through 11.
Row 5 - 6	Reference of the base publication defining the Effective Dose, either as a coded value, or a textual bibliographic reference. ICRP Publication 60 shall be referenced using the assigned coded value.
Row 7	Description of the method used for Effective Dose evaluations.
Row 8	Description of the reference-patient mathematical or computational model used when Effective Dose is derived via Monte Carlo simulations of radiation transport in such models. Examples of publications which specify particular reference patient models are NUREG/CR-1159, ORNL/NUREG/TM-367 (1980); NRPB-R186 (1985); GSF-Bericht S-885 (1986); Fill et al., Health Physics Vol. 86 (3): 253-272 (2004).
Row 9	Description of the condition Effective Dose measured.
Row 10	Type of Effective Dose phantom used, e.g. Alderson-Rando.
Row 11	Type of dosimeter used, e.g. TLD (Thermo Luminescence Dosimeter).

TID 10013 CT Irradiation Event Data

This template conveys the dose and equipment parameters of a single irradiation event.

A CT irradiation event is the occurrence of irradiation being applied to a patient in single continuous time-frame between the start (release) and the stop (cease) of the irradiation. Any on-off switching of the radiation source during the event shall not be treated as separate events; rather the event includes the time between start and stop of radiation as triggered by the user, e.g., a single sequence of scanning comprised of multiple slices acquired with successive tube rotations and table increments shall be treated as a single irradiation event. Depending on the examination workflow and the anatomical target region the CT irradiation event data may split into multiple instances of this template for better dose estimation. The irradiation event is the "smallest" information entity to be recorded in the realm of Radiation Dose reporting. Individual Irradiation Events are described by a set of accompanying physical parameters that are sufficient to understand the "quality" of irradiation that is being applied. This set of parameters may be different for the various types of equipment that are able to create irradiation events.

TID 10013
CT IRRADIATION EVENT DATA
Type: Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (113819, DCM, "CT Acquisition")	1	M		
2	>	CONTAINS	TEXT	EV (125203, DCM, "Acquisition Protocol")	1	U		
3	>	CONTAINS	CODE	EV (123014-, DCM, "Target Region")	1	M		DCID (4030) CT and MR Anatomy Imaged
4	>	CONTAINS	CODE	EV (113820, DCM, "CT Acquisition Type")	1	M		DCID (10013) CT Acquisition Types
5	>	CONTAINS	CODE	**EV** (~~**G-C232**~~**G-C32C**, SRT, "Procedure Context")	1	U		DCID (10014) Contrast Imaging Technique
6	>	CONTAINS	UIDREF	EV (113769, DCM, "Irradiation Event UID")	1	M		
7	>	CONTAINS	NUM	EV (113821, DCM, "X-ray Filter Aluminium Equivalent")	1	U		Units = EV (mm, UCUM, "mm")
8	>	CONTAINS	CONTAINER	EV (113822, DCM, "CT Acquisition Parameters")	1	M		
9	>>	CONTAINS	NUM	EV (113824, DCM, "Exposure Time")	1	M		Units = EV (s, UCUM, "s")
10	>>	CONTAINS	NUM	EV (113825, DCM, "Scanning Length")	1	M		Units = EV (mm, UCUM, "mm")
11	>>	CONTAINS	NUM	EV (113826, DCM, "Nominal Single Collimation Width")	1	M		Units = EV (mm, UCUM, "mm")
12	>>	CONTAINS	NUM	EV (113827, DCM, "Nominal Total Collimation Width")	1	M		Units = EV (mm, UCUM, "mm")
13	>>	CONTAINS	NUM	EV (113828, DCM, "Pitch Factor")	1	MC	IF row 4 equals (P5-08001, SRT, "Spiral Acquisition") or equals (113804, DCM, "Sequenced Acquisition")	Units = EV ({ratio}, UCUM, "ratio")
14	>>	CONTAINS	NUM	EV (113823, DCM, "Number of X-ray Sources")	1	M		Units = EV ({X-ray sources}, UCUM, "X-ray sources")
15	>>	CONTAINS	CONTAINER	EV (113831, DCM, "CT X-ray Source Parameters")	1-n	M		

16	>>>	CONTAINS	TEXT	EV (113832, DCM, "Identification Number of the X-ray Source")	1	M		
17	>>>	CONTAINS	NUM	EV (113733, DCM, "KVP")	1	M		Units = EV (kV, UCUM, "kV")
18	>>>	CONTAINS	NUM	EV (113833, DCM, "Maximum X-ray Tube Current")	1	M		Units = EV (mA, UCUM, "mA")
19	>>>	CONTAINS	NUM	EV (113734, DCM, "~~**Mean** X-~~**R~~r**ay Tube Current"	1	M		Units = EV (mA, UCUM, "mA")
20	>>>	CONTAINS	NUM	EV (113834, DCM, "Exposure Time per Rotation")	1	MC	IF row 4 does not equal (113805, DCM, "Constant Angle Acquisition")	Units = EV (s, UCUM, "s")
21	>	CONTAINS	CONTAINER	EV (113829, DCM, "CT Dose")	1	MC	IF row 4 does not equal (113805, DCM, "Constant Angle Acquisition")	
22	>>	CONTAINS	NUM	EV (113830, DCM, "Mean CTDIvol ")	1	M		Units = EV (mGy, UCUM, "mGy")
23	>>	CONTAINS	CODE	EV (113835, DCM, "CTDIw Phantom Type")	1	M		DCID (4052) Phantom Devices
24	>>	CONTAINS	NUM	EV (113836, DCM, "CTDIfreeair Calculation Factor")	1	U		Units = EV (mGy/mAs, UCUM, "mGy/mAs")
25	>>	CONTAINS	NUM	EV (113837, DCM, "Mean CTDIfreeair")	1	U		Units = EV (mGy, UCUM, "mGy")
26	>>	CONTAINS	NUM	EV (113838, DCM, "DLP")	1	M		Units = EV (mGycm, UCUM, "mGycm")
27	>>	CONTAINS	NUM	EV (113839, DCM, "Effective Dose")	1	U		Units = EV (mSv, UCUM, "mSv")
28	>>>	HAS CONCEPT MOD	CODE	EV (G-C036, SRT, "Measurement Method")	1	MC	IF row 27 is present	DCID (10011) ~~"~~Effective Dose Evaluation Method~~")~~
29	>>> >	HAS PROPERTIES	NUM	EV (113840, DCM, "Effective Dose Conversion Factor")	1	MC	IF row 28 is present and equals (113800, DCM, "DLP to E conversion via MC computation") or equals (113802, DCM, "DLP to E conversion via measurement")	Units = EV (mSv/mGycm, UCUM, "mSv/mGycm")
30	>	CONTAINS	TEXT	EV (121106, DCM, "Comment")	1	U		
31	**>**	**CONTAINS**	**INCLUDE**	**DTID (1020) Person Participant**	**1-n**	**U**		**$PersonProcedureRole = EV (113851, DCM, "Irradiation Administering")**
32	**>**	**CONTAINS**	**INCLUDE**	**DTID (1021) Device Participant**	**1**	**M**		**$DeviceProcedureRole = EV (113859, DCM, "Irradiating Device")**

Content Item Descriptions

Row 2	User-defined type of clinical acquisition protocol for creating images or image-derived measurements. May be taken from Protocol Name (0018,1030) or from Performed Procedure Step Description (0040,0254).
Row 3	The target region is the anatomy exposed.
Row 4	Description of the method used during acquisition of this CT irradiation event, may be derived from Acquisition Type (0018,9302).

Row 5	The acquisition was performed with or without contrast medium application.
Row 7	Thickness of an equivalent filter constructed from aluminum.
Row 9	Total time the patient has received X-ray exposure during the irradiation event.
Row 10	For Spiral scanning, the scanning length is normally the table travel in mm during the tube loading. For Sequenced scanning, the scanning length is the table travel between consecutive scans times the number of scans. For Stationary and Free scanning, the scanning length is the nominal width of the total collimation.
Row 11	The value of the nominal width (referenced to the location of the isocenter along the z axis) of a single collimated slice in mm.
Row 12	The value of the nominal width (referenced to the location of the isocenter along the z axis) of the nominal total collimation in mm over the area of active X-ray detection (z-coverage).
Row 13	Pitch Factor: For Spiral Acquisition, the Pitch Factor is the ratio of the Table Feed per Rotation to the Nominal Total Collimation Width. For Sequenced Acquisition, the Pitch Factor is the ratio of the Table Feed per single sequenced scan to the Nominal Total Collimation Width.
Row 15	CT X-ray source parameters related to the acquisition. For each X-ray source an item must be present.
Row 16	Identification Number of the X-ray source. Identifies the particular X-ray source (in a multi-source CT system) for which the set of X-ray source parameter values is reported.
Row 17	KVP value as measured/recorded by system.
Row 19	Mean tube current as measured/recorded by system.
Row 20	Exposure time as measured/recorded by the system per rotation.
Row 21	CT Dose for one acquisition.
Row 22	"Mean $CTDI_{vol}$" refers to the average value of the $CTDI_{vol}$ applied within this acquisition. $CTDI_{vol}$ is the volume $CTDI_w$, where $CTDI_w$ is the weighted computed tomography dose index 100 as defined in IEC 60601-2-44. For Sequenced and Spiral scanning, $CTDI_{vol}$ = $CTDI_w$/Pitch Factor. For Stationary and Free scanning, $CTDI_{vol}$ = $CTDI_w$ × Cumulative Exposure Time/ Exposure Time Per Rotation. See also CTDIvol (0018,9345) and Spiral Pitch Factor (0018,9311) in the Enhanced CT Information Object Description (PS 3.3).
Row 23	The type of phantom used for CTDI measurement according to IEC 60601-2-44 (e.g. Head 16 cm diameter PMMA, Body 32 cm diameter PMMA).
Row 24	The $CTDI_{free\ air}$ Calculation Factor is the $CTDI_{free\ air}$ per mAs, expressed in units of mGy/mAs. The $CTDI_{free\ air}$ Calculation Factor may be used in one method calculating Dose. For example, for this acquisition, Effective Dose = Mean X-ray Tube Current × Cumulative Exposure Time × $CTDI_{free\ air}$ Calculation Factor × (Effective Dose/ $CTDI_{free\ air}$).
Row 25	Mean $CTDI_{free\ air}$ is the mean CTDI for this acquisition, evaluated free-in-air according to IEC 60601-2-44. Mean $CTDI_{free\ air}$ = Mean X-ray Tube Current × Cumulative Exposure Time × $CTDI_{free\ air}$ Calculation Factor. The $CTDI_{free\ air}$ may be used in one method of calculating Effective Dose.
Row 26	For Spiral scanning, DLP = $CTDI_{vol}$ × Scanning Length. For Sequenced scanning, DLP = $CTDI_{vol}$ × Nominal Total Collimation Width × Cumulative Exposure Time / Exposure Time per Rotation. For Stationary and Free scanning, DLP = $CTDI_{vol}$ × Nominal Total Collimation Width (according to IEC 60601-2-44).
Row 27	Effective Dose in mSv of the single continuous time-frame of the irradiation computed as described in TID 10012.

Row 29	The Effective Dose Conversion Factor is the ratio of the Effective Dose to the DLP, expressed in units of mSv/mGycm, and it is used as a factor in one method of estimating Effective Dose. Monte Carlo Simulations (or dosimetric measurements in an anthropomorphic phantom, e.g., the Alderson-Rando phantom) may be used as a basis for the evaluation of Effective Dose Conversion Factors.
Row 31	**People responsible for the administration of the radiation reported in the irradiation event. May include values which would appear in Performing Physicians' Name (0008,1050), Performing Physician Identification Sequence (0008,1052), Operators' Name (0008,1070) and/or Operator Identification Sequence (0008,1072).**
Row 32	**The device which produced the irradiation in this Irradiation Event. I.e. the CT scanner.**

Context ID 10000
Scope of Accumulation

Type: Extensible **Version: 20081028~~20051101~~**

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
DCM	113014	Study
DCM	113015	Series
DCM	113016	Performed Procedure Step
DCM	**113852**	**Irradiation Event**

Context ID 10001
UID Types

Type: Extensible **Version: 20081028~~20051101~~**

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
DCM	110180	Study Instance UID
DCM	112002	Series Instance UID
DCM	121126	Performed Procedure Step SOP Instance UID
DCM	**113853**	**Irradiation Event UID**

Context ID 10003
Equipment Plane Identification

Type: Extensible **Version: 20081028~~20051101~~**

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
DCM	113620	Plane A
DCM	113621	Plane B
DCM	113622	Single Plane

DCM	**113890**	**All Planes**

Context ID 7453
Performing Roles

Type: Extensible Version: 2008102820020904

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
DCM	121094	Performing
DCM	121095	Referring
DCM	121096	Requesting
…	…	…
DCM	121101	Standby
DCM	**113850**	**Irradiation Authorizing**
DCM	**113851**	**Irradiation Administering**

Add the following CID in Part 16

TID 1020 Person Participant

This template describes a person participating in an activity as other than an observer or subject. E.g. for a dose report documenting an irradiating procedure, participants include the person administering the irradiation and the person authorizing the irradiation.

This Template is included with specific contextual parameters from a parent Template.

TID 1020 Parameters

Parameter Name	Parameter Usage
$PersonProcedureRole	**Coded term or Context Group for the Concept Name that describes the nature of the person's participation in this procedure.**

TID 1020
PERSON PARTICIPANT
Type: Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			PNAME	EV (113870,DCM, "Person Name")	1	M		
2	>	HAS PROPERTIES	CODE	EV (113875,DCM, "Person Role in Procedure")	1	M		$PersonProcedureRole
3	>	HAS	TEXT	EV (113871,DCM,	1	U		

		PROPERTIES		"Person ID")				
4	>	HAS PROPERTIES	TEXT	EV (113872,DCM, "Person ID Issuer")	1	U		
5	>	HAS PROPERTIES	TEXT	EV (113873,DCM, "Organization Name")	1	U		
6	>	HAS PROPERTIES	CODE	EV (113874,DCM, "Person Role in Organization")	1	U		BCID (7452) Organizational Roles

Content Item Descriptions

Row 1	The name of the person participating in the role identified in Row 2.
Row 2	The procedural role played by the person in this procedure.
Row 6	The organizational role played by the person in the organization.

TID 1021 Device Participant

This template describes a device participating in an activity as other than an observer or subject. E.g. for a dose report documenting an irradiating procedure, participants include the irradiating device.

This Template is included with specific contextual parameters from a parent Template.

TID 1021 Parameters

Parameter Name	Parameter Usage
$DeviceProcedureRole	Coded term or Context Group for the Concept Name that describes the nature of the device's participation in this procedure.

TID 1021
DEVICE PARTICIPANT
Type: Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CODE	EV (113876, DCM, "Device Role in Procedure")	1	M		$DeviceProcedureRole
2	>	HAS PROPERTIES	TEXT	EV (113877, DCM, "Device Name")	1	U		
3	>	HAS PROPERTIES	TEXT	EV (113878, DCM, "Device Manufacturer")	1	M		
4	>	HAS PROPERTIES	TEXT	EV (113879, DCM, "Device Model Name")	1	M		
5	>	HAS PROPERTIES	TEXT	EV (113880, DCM, "Device Serial Number")	1	M		

Content Item Descriptions

Row 1	If no Device Procedure Role is provided, BCID (7445) Device Participating Roles

	may be used.
Row 2	**This may be used for the name by which the organization manages the device.**

Context ID 7445
Device Participating Roles

Type: Extensible Version: 20081028

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
DCM	113859	Irradiating Device

Context ID 10020
Source of Projection X-Ray Dose Information

Type: Extensible Version: 20081028

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
DCM	113856	Automated Data Collection
DCM	113857	Manual Entry
DCM	113858	MPPS Content
SRT	A-2C090	Dosimeter

Context ID 10021
Source of CT Dose Information

Type: Extensible Version: 20081028

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
DCM	113856	Automated Data Collection
DCM	113857	Manual Entry

Context ID 10025
Radiation Dose Reference Points

Type: Extensible Version: 20081028y

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
DCM	113860	15cm from Isocenter toward Source
DCM	113861	30cm in Front of Image Input Surface

DCM	**113862**	**1cm above Tabletop**
DCM	**113863**	**30cm above Tabletop**
DCM	**113864**	**15cm from Table Centerline**
DCM	**113865**	**Entrance exposure to a 4.2 cm breast thickness**

Add the following text in Annex D in Part 16

DICOM Code Definitions (Coding Scheme Designator "DCM" Coding Scheme Version "01")

Code Value	Code Meaning	Definition	Notes
…			
121342	**Dose Image**	**Image providing a graphic view of the distribution of radiation dose**	
113850	**Irradiation Authorizing**	**The clinician responsible for determining that the irradiating procedure was appropriate for the indications**	
113851	**Irradiation Administering**	**The person responsible for the administration of radiation**	
113852	**Irradiation Event**	**An irradiation event is the occurrence of radiation being applied to a patient in a single continuous time-frame between the start (release) and the stop (cease) of the irradiation. Any automatic on-off switching of the irradiation source during the event is not treated as separate events, rather the event includes the time between start and stop of irradiation as triggered by the user. E.g., a pulsed fluoro X-Ray acquisition shall be treated as a single irradiation event.**	
113853	**Irradiation Event UID**	**Unique Identifier of an Irradiation Event**	
113854	**Source of Dose Information**	**Method by which dose-related details of an Irradiation Event were obtained.**	
113855	**Total Acquisition Time**	**Total accumulated acquisition time (in the scope of the**	

		including report)	
113856	Automated Data Collection	Direct recording of data by a relevant system	
113857	Manual Entry	Recording of data by a human operator, including manual transcription of electronic data	
113858	MPPS Content	The data is taken from an MPPS SOP Instance	
113859	Irradiating Device	A device exposing a patient to ionizing radiation.	
113860	15cm from Isocenter toward Source	15cm from the isocenter towards the x-ray source; See IEC 60601-2-43	
113861	30cm in Front of Image Input Surface	30cm in front (towards the tube) of the input surface of the image receptor; See FDA Federal Performance Standard for Diagnostic X-ray Systems §1020.32(d)(7)	
113862	1cm above Tabletop	1cm above the patient tabletop or cradle; See FDA Federal Performance Standard for Diagnostic X-ray Systems §1020.32(d)(7)	
113863	30cm above Tabletop	30cm above the patient tabletop of cradle; See FDA Federal Performance Standard for Diagnostic X-ray Systems §1020.32(d)(7)	
113864	15cm from Table Centerline	15cm from the centerline of the x-ray table and in the direction of the x-ray source; See FDA Federal Performance Standard for Diagnostic X-ray Systems §1020.32(d)(7)	
113865	Entrance exposure to a 4.2 cm breast thickness	Standard breast means a 4.2 centimeter (cm) thick compressed breast consisting of 50 percent glandular and 50 percent adipose tissue. See Department of Health and Human Services, Food and Drug Administration. Mammography quality standards; final rule. Federal Register. Oct. 28, 1997; 68(208):55852–55994. See 900.2(uu)	
113870	Person Name	The name of a specific person	

113871	Person ID	An identification number or code for a specific person	
113872	Person ID Issuer	The organization which issued a Person ID	
113873	Organization Name	The name of an organization	
113874	Person Role in Organization	The role played by a person in an organization	
113875	Person Role in Procedure	The role played by a person in a procedure	
113876	Device Role in Procedure	The role played by a device in a procedure	
113877	Device Name	The name used to refer to a device; usually locally unique	
113878	Device Manufacturer	Manufacturer of a device	
113879	Device Model Name	Model Name of a device	
113880	Device Serial Number	Serial Number of a device	
113890	All Planes	All planes of a multi-plane acquisition equipment	