

DICOM Correction Proposal

STATUS	Final Text
Date of Last Update	2018/06/05
Person Assigned	Ulrich Busch (ulrich.busch@varian.com)
Submitter Name	Ulrich Busch (ulrich.busch@varian.com)
Submission Date	2017/11/07

Correction Number	1762
Log Summary: Fix Omitted Attribute in Verification Control Points	
Name of Standard PS3.3 2018b	
Rationale for Correction: CP 1658 enhanced the capabilities of the verification control points. The verification control point sequence has been moved from the RT Fraction module to the RT Beams module, but in editing the change proposal one attribute to be moved (Average Beam Dose Point Source to External Contour Distance) was initially overlooked and remained at the original location until removed in the 2017e release. The function of the Attribute was not replaced, however. The function of the Attribute is moved to the new location and a new Attribute (Beam Dose Point Source to External Contour Distance) is used. The term 'Average' in the name is removed line with other attributes of that sequence with the same Rationale.	
Correction Wording:	

In PS 3.3, Section C.8.8.13 RT Fraction Scheme Module, Table C.8-49, make the following changes:

Table C.8-49 RT FRACTION SCHEME MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Fraction Group Sequence	(300A,0070)	1	Sequence of Fraction Groups in current Fraction Scheme. One or more Items shall be included in this Sequence.
>Fraction Group Number	(300A,0071)	1	Identification number of the Fraction Group. The value of Fraction Group Number (300A,0071) shall be unique within the RT Plan in which it is created.
...			
>Referenced Beam Sequence	(300C,0004)	1C	Sequence of treatment beams in current Fraction Group. One or more Items shall be included in this Sequence. Required if Number of Beams (300A,0080) is greater than zero.

Attribute Name	Tag	Type	Attribute Description
>>Referenced Beam Number	(300C,0006)	1	Uniquely identifies Beam specified by Beam Number (300A,00C0) within Beam Sequence (300A,00B0) in RT Beams Module or within Ion Beam Sequence (300A,03A2) in RT Ion Beams Module.
>>Beam Dose Specification Point	(300A,0082)	3	Coordinates (x,y,z) of point at which Beam Dose is specified in the patient based coordinate system described in Section C.7.6.2.1.1 (mm). See Note 3.
>>Referenced Dose Reference UID	(300A,0083)	3	Identifies the Dose Reference specified by Dose Reference UID (300A,0013) in the Dose Reference Sequence (300A,0010) in the RT Prescription Module which specifies the primary target for the current Beam. If present shall have a value that is present in the Dose Reference Sequence.
>>Beam Dose	(300A,0084)	3	Dose (in Gy) at Beam Dose Specification Point (300A,0082) due to current Beam for one treatment fraction.
>>Beam Dose Type	(300A,0090)	1C	Type of Dose of the Beam Dose (300A,0084). Enumerated Values: PHYSICAL EFFECTIVE Shall not have the same value as Alternate Beam Dose Type (300A,0092). Required if Alternate Beam Dose (300A,0091) is present. May be present otherwise.
>>Alternate Beam Dose	(300A,0091)	3	Alternate Dose (in Gy) at Beam Dose Specification Point (300A,0082) according to the Alternate Beam Dose Type (300A,0092).
>>Alternate Beam Dose Type	(300A,0092)	1C	Type of Dose of the Alternate Beam Dose (300A,0091). Enumerated Values: PHYSICAL EFFECTIVE Shall not have the same value as Beam Dose Type (300A,0090). Required if Alternate Beam Dose (300A,0091) is present.
>>>Average Beam Dose Point Source to External Contour Distance	(300A,0131)	3	Average Source to External Contour distance (mm) including devices associated with the patient anatomy model along a ray from the source to the dose point specified by the Beam Dose Specification Point (300A,0082) from the current Beam Dose Verification Control Point to the next one. See Section C.8.8.14.15
>>Beam Meterset	(300A,0086)	3	Machine setting to be delivered for current Beam, specified in Monitor Units (MU) or minutes as defined by Primary Dosimeter Unit (300A,00B3) (in RT Beams Module) for referenced Beam. See Note 4.

Attribute Name	Tag	Type	Attribute Description
>>Beam Delivery Duration Limit	(300A,00C5)	3	The expected maximum delivery time in sec. See Note 7.
...			

In PS 3.3, Section C.8.8.14 RT Beams Module, Table C.8-50, make the following changes:

C.8.8.14 RT Beams Module

The RT Beams Module contains information defining equipment parameters for delivery of external radiation beams.

Table C.8-50 RT BEAMS MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Beam Sequence	(300A,00B0)	1	Sequence of treatment beams for current RT Plan. One or more Items shall be included in this Sequence.
>Beam Number	(300A,00C0)	1	Identification number of the Beam. The value of Beam Number (300A,00C0) shall be unique within the RT Plan in which it is created. See Note 1.
...			
>General Accessory Sequence	(300A,0420)	3	Introduces a Sequence of General Accessories associated with this Beam. One or more Items are permitted in this Sequence.
...			
>>Accessory Code	(300A,00F9)	3	Machine-readable identifier for this accessory
>>Source to General Accessory Distance	(300A,0425)	3	Radiation source to general accessory distance (in mm) for current accessory.
>Referenced Dose Reference Sequence	(300C,0050)	3	A sequence of Dose References for which verification control points are defined. One or more Items are permitted in this Sequence.
>>Referenced Dose Reference Number	(300C,0051)	1	Uniquely identifies Dose Reference specified by Dose Reference Number (300A,0012) in Dose Reference Sequence (300A,0010) in RT Prescription Module.
>>Depth Value Averaging Flag	(300A,0093)	1C	Whether or not the depth values have been averaged. Enumerated Values: YES The values represent average values from the current Verification Control Point to the next NO The values refer to a single location Required if the referenced beam describes

			an angular movement and the depth values change during movement.
>>Beam Dose Verification Control Point Sequence	(300A,008C)	1	Sequence of Items containing Beam Dose Coordinate Verification Control Points. Two or more items Items shall be included in this Sequence.
>>>Cumulative Meterset Weight	(300A,0134)	1	The cumulative meterset weight value, at which the beam dose point geometrical parameters apply.
>>>Referenced Control Point Index	(300C,00F0)	1C	Uniquely identifies the Control Point specified by Control Point Index (300A,0112) within Beam referenced by Referenced Beam Number (300C,0006). See Section C.8.8.14.16. Required, if the Referenced Cumulative Meterset corresponds to a Control Point in the Control Point Sequence (300A,0111).
>>>Beam Dose Point Depth	(300A,0088)	1C	The depth (in mm) in the patient along a ray from the source to the dose point specified by the Dose Reference Point Coordinates (300A,0018) or the referenced ROI. Required for all but the last Item in this Sequence and for the last Item if Depth Value Averaging Flag (300A,0093) has a value of NO. See Note 6.
>>>Beam Dose Point Equivalent Depth	(300A,0089)	1C	The radiological depth in mm (water-equivalent depth, taking tissue heterogeneity into account) in the patient along a ray from the source to the dose point specified by the Dose Reference Point Coordinates (300A,0018) or the referenced ROI. Required for all but the last Item in this Sequence and for the last Item if Depth Value Averaging Flag (300A,0093) has a value of NO. See Note 6.
>>>Beam Dose Point SSD	(300A,-008A)	1C	Source to patient surface (skin) distance in mm along a ray from the source to the dose point specified by the Dose Reference Point Coordinates (300A,0018) or the referenced ROI. Required for all but the last Item in this Sequence and for the last Item if Depth Value Averaging Flag (300A,0093) has a value of NO. See Note 6.
>>>Beam Dose Point Source to External Contour Distance	(300A,0094)	3	<u>Source to External Contour distance in mm including devices associated with the patient anatomy model along a ray from the source to the dose point specified by the Dose Reference Point</u>

			<p><u>Coordinates (300A,0018) or the referenced ROI.</u></p> <p><u>Required for all but the last Item in this Sequence and for the last Item if Depth Value Averaging Flag (300A,0093) has a value of NO.</u></p> <p><u>See Section C.8.8.14.15</u></p>
>Final Cumulative Meterset Weight	(300A,010E)	1C	Value of Cumulative Meterset Weight (300A,0134) for final Control Point in Control Point Sequence (300A,0111). Required if Cumulative Meterset Weight is non-null in Control Points specified within Control Point Sequence (300A,0111). See Section C.8.8.14.1.
>Number of Control Points	(300A,0110)	1	Number of control points in Beam. Value shall be greater than or equal to 2.
>Control Point Sequence	(300A,0111)	1	Sequence of machine configurations describing treatment beam. The number of Items in this Sequence shall equal the value of Number of Control Points (300A,0110). See Section C.8.8.14.5 and Section C.8.8.14.6.
>>Control Point Index	(300A,0112)	1	Index of current Control Point, starting at 0 for first Control Point.
>>...			

In PS 3.6, Section 6 Registry of DICOM data elements:

Tag	Name	Keyword	VR	VM	
<u>(300A,0094)</u>	<u>Beam Dose Point Source to External Contour Distance</u>	<u>BeamDosePointSourceTo ExternalContourDistance</u>	<u>DS</u>	<u>1</u>	