DICOM Correction Proposal

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Correction Number	CP-202
Log Summary: Clarification for Presentation Lut Descriptor	
Type of Modification: Correction & Clarification	Name of Standard PS 3.3 & PS 3.4 - 2000
Rationale for Correction: There is no description for the Print Presentation Lut descriptor. Furthermore the element (0028,3002), third value described in PS 3.3 table C.11.4 and in PS 3.4 Table H.4-23 was corrected. Moreover, a description of the Presentation Lut descriptor is added as well, in part 3 section C.11.4.1 and referred to it from part 4.	
Sections of document affected: PS 3.3-2000, Section C.11.4 and PS 3.4 H.4-23	
Correction Wording: See below.	

Amend PS 3.4-2000 Section H.4.9.2.1.1 Table H.4-23 Lut Descriptor, element (0028,3002) Description.

Table H.4-23
N-CREATE ATTRIBUTE LIST

Attribute name	Tag	Usage SCU/SCP
Presentation LUT Sequence	(2050,0010)	MC/M (Required if Presentation LUT Shape (2050,0020) is not present. Not allowed otherwise.)
>LUT Descriptor	(0028,3002)	MC/M (Required if sequence is present. The first value (number of entries in the LUT) shall be equal to 256 if Bits Stored = 8 4096 if Bits Stored = 12. The second value shall be equal to 0. The third value (number of ~~bytes~~ **bits** for each LUT entry) shall be 10-16.) ~~Note: The number of bytes that is sent via this LUT will be 2^n, where n is the third value.~~ See the definition in PS 3.3 for further explanation.
>LUT Explanation	(0028,3003)	U/U
>LUT Data	(0028,3006)	MC/M (Required if sequence is present)
Presentation LUT Shape	(2050,0020)	MC/M (Required if Presentation LUT Sequence (2050,0010) is not present. Not allowed otherwise.) SCPs shall support the Enumerated Values IDENTITY and LIN OD

Amend PS 3.3-2000 Section C.11.4, Table C.11-4 Lut Descriptor, element (0028,3002) Description.

C.11.4 Presentation LUT Module

Table C.11-4 specifies the Attributes that describe the Presentation LUT.

Table C.11-4
Presentation LUT Module

Attribute name	Tag	Description
Presentation LUT Sequence	(2050,0010)	Defines a sequence of Presentation LUTs. Only a single item shall be included in this sequence.
>LUT Descriptor	(0028,3002)	Specifies the format of the LUT Data in this Sequence. Required if Presentation LUT Sequence (2050,0010) is sent. See C.11.4.1 for further explanation.
>LUT Explanation	(0028,3003)	Free form text explanation of the meaning of the LUT.
>LUT Data	(0028,3006)	LUT Data in this Sequence.
Presentation LUT Shape	(2050,0020)	Specifies pre-defined Presentation LUT shapes. Enumerated Values : IDENTITY = input to the Presentation LUT is in P-Values, no further translation is necessary. LIN OD = input to Presentation LUT is in linear optical density over the range of Min Density (2010,0120) and Max Density (2010,1030). Note: LIN OD is only defined for hardcopy devices and is not applicable to softcopy devices.

Add PS 3.3-1999 Section C.11.4.1 LUT Descriptor

C.11.4.1 LUT Descriptor

The three values of the LUT Descriptor (0028,3002) describe the format of the data in LUT Data (0028,3006).

The first value is the number of entries in the lookup table. When the number of table entries is equal to 2^{16} then this value shall be 0. The number of entries shall be equal to the number of possible values in the input. (For 8 bit input will be 256 entries, for 12 bit input it will be 4096 entries)

The second value is the first input value mapped, and shall always be 0. The Value Representation of the second value is always US. This input value is mapped to the first entry in the LUT. Subsequent input values are mapped to the subsequent entries in the LUT Data up to an input value equal to number of entries + first value mapped - 1 which is mapped to the last entry in the LUT Data. There are no input values greater than number of entries – 1.

The third value specifies the number of bits for each entry in the LUT Data. It shall be between 10 and 16 inclusive. The LUT Data shall be stored in a format equivalent to 16 bits allocated where the high bit is equal to bits stored - 1, where bits stored is the third value.

Note: Since the LUT Descriptor (0028,3002) Attribute is multi-valued, in an Explicit VR Transfer Syntax, only one value representation (US or SS) may be specified. Since all three values are always by definition interpreted as unsigned, the explicit VR actually used will always be US.

LUT Data (0028,3006) contains the LUT entry values, which are P-Values.

The output range is from 0 to 2^n-1 where n is the third value of LUT Descriptor. This range is always unsigned.

This range specifies the output range of the P-Values.