DICOM Correction Proposal

STATUS	Final Text
Date of Last Update	2025/03/31
Person Assigned	Rob Horn
Submitter Name	Gary Carter <gary.carter@eigen.com>
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Correction Number	CP-2433
Log Summary: Clarify Vector Grid Data memory layout	
Name of Standard PS3.3 2025a	
Rationale for Correction: A multi-dimensional array indexed as [i,j,k], when stored linearly in memory, can have i or k as the most rapidly varying index. Why not just say which? The existing text talks about "vector planes". This is ambiguous, because a 3D rectangular grid can be represented as a stack of planes in three different ways: planes perpendicular to the X-axis, Y-axis, or Z-axis.	
Correction Wording:	

Modify PS3.3 Section C.20.3.1.3 Vector Grid Data as shown

The order of vectors encoded for each vector plane shall be left to right, top to bottom, i.e., the upper left vector (labeled 1,1) is encoded first followed by the remainder of row 1, followed by the first vector of row 2 (labeled 2,1) then the remainder of row 2 and so on.

I.e., the index into the grid data for a point with indices (i, j, k) is:

$$index = k * Y_D * X_D + j * X_D + i$$

A vector triple with values of (NaN,NaN,NaN) shall indicate that the transformation at that point of the deformation grid is undefined.

The size of this Attribute value is determined by the dimensions specified in Grid Dimensions (0064,0007). For dimensions of $X_D \backslash Y_D \backslash Z_D$, the size of the Attribute value can be calculated with Equation C.20.3-2.

Number of Bytes = $X_D * Y_D * Z_D * 3 * 4$ (C.20.3-2)