

## DICOM Correction Proposal

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Correction Number	CP-1954
Log Summary: Fix inconsistent DIMSE status code meaning	
Name of Standard PS3.4, PS3.7 2019e	
Rationale for Correction: <p>The prefix “Refused:”, “Failed:” or “Error:” for DIMSE status code meanings of the service status “Failure” is currently not always used consistently within the DICOM standard. Furthermore, some DIMSE status codes of the service status “Failure” do not have a prefix at all. This is especially true for DIMSE-N messages (but also for some DICOM services in PS3.4 that are based on DIMSE-C messages).</p> <p>The purpose of this CP is to unify the naming of DIMSE status code meanings since they are not only used in the standard text (e.g. PS3.4 and PS3.7) but also in DICOM Conformance Statements, DICOM toolkits, etc. and should, therefore, be consistent.</p> <p><i>Editorial change #1:</i> the DIMSE status code tables in PS3.4 should always use a “row span” for the “Service Status” column, e.g. in table B.2-1, C.4-1, C.4-2, C.4-3 and K.4-1.</p> <p><i>Editorial change #2:</i> the upper and lower case of DIMSE status code meanings is not always consistent, e.g. “Error: Data Set Does Not Match SOP Class” vs. “Error: Data Set does not match SOP Class”. Make these consistent (do not capitalize words later in clause).</p> <p>This CP is anything but complete. It is “just another attempt” for a partial DIMSE status code cleanup (after e.g. CP 1222 and 1403).</p>	
Correction Wording:	

*PS3.4 Section C.4.3.1.4:*

### C.4.3.1.4 Status

Table C.4-3 defines the specific status code values that might be returned in a C-GET response. General status code values and fields related to status code values are defined for C-GET DIMSE Service in [PS3.7](#).

**Table C.4-3. C-GET Response Status Values**

Service Status	Further Meaning	Status Codes	Related Fields
Failure	Refused: Out of Resources - Unable to calculate number of matches	A701	(0000,0902)
	Refused: Out of Resources - Unable to perform sub-operations	A702	(0000,1021) (0000,1022) (0000,1023)
	Error: Data Set does not match SOP Class	A900	(0000,0901)

Service Status	Further Meaning	Status Codes	Related Fields
			(0000,0902)
	Failed: Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Sub-operations Complete - One or more Failures or Warnings	B000	(0000,1021) (0000,1022) (0000,1023)
Success	Sub-operations Complete - No Failures or Warnings	0000	(0000,1021) (0000,1022) (0000,1023)
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

Some Failure Status Codes are implementation specific.

An SCP implementation shall assign specific failure status codes by replacing each 'x' symbol with a hexadecimal digit in the range from 0 to F. An SCP implementation wishing to differentiate between causes of "Failed:— Unable to process" Failure Meaning shall assign those causes specific Status Code Values within valid range specified in [Table C.4-3](#).

An SCU implementation shall recognize any Failure Status Code within the value range specified in [Table C.4-3](#) as an indicator of the Failure Meaning stated in the table. There is no requirement for an SCU implementation to differentiate between specific Status Codes within the valid range.

<i>Change PS3.4 Section F.8.1</i>
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### F.8.1 DIMSE Service Group

The DIMSE Services shown in [Table F.8.1-1](#) are applicable to the Modality Performed Procedure Step IOD under the Modality Performed Procedure Step Retrieve SOP Class.

**Table F.8.1-1. DIMSE Service Group Applicable to Modality Performed Procedure Step Retrieve**

DICOM Message Service Element	Usage SCU/SCP
N-GET	M/M

The DIMSE Services and Protocols are specified in [PS3.7](#). If the Modality Performed Procedure Step Object is no longer available the Request Primitive will be answered with a Failure Status message "No Such **SOPObject** Instance".

### Y.4.2.1.4 Status

The status code values that might be returned in a C-GET response shall be as specified in [Table Y.4-2](#)

**Table Y.4-2. C-GET Response Status Values for Instance Root Retrieve**

Service Status	Further Meaning	Status Codes	Related Fields
Failure	Refused: Out of Resources - Unable to calculate number of matches	A701	(0000,0902)
	Refused: Out of Resources - Unable to perform sub-operations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
	<b>Error: Data Set Identifier</b> does not match SOP Class	A900	(0000,0901) (0000,0902)
	<b>Failed:</b> Unable to process	Cxxx	(0000,0901) (0000,0902)
	<b>Failed:</b> None of the frames requested were found in the SOP Instance	AA00	(0000,0902)
	<b>Failed:</b> Unable to create new object for this SOP Class	AA01	(0000,0902)
	<b>Failed:</b> Unable to extract frames	AA02	(0000,0902)
	<b>Failed:</b> Time-based request received for a non-time-based original SOP Instance.	AA03	(0000,0902)
	<b>Failed:</b> Invalid Request	AA04	(0000,0901) (0000,0902)
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Sub-operations Complete - One or more Failures or Warnings	B000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Success	Sub-operations Complete - No Failures or Warnings	0000	(0000,1020) (0000,1021) (0000,1022)

Service Status	Further Meaning	Status Codes	Related Fields
			(0000,1023)
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

Change PS3.4 Section CC.2.1.4

### CC.2.1.4 Status Codes

Table CC.2.1-2 defines the status code values that might be returned in a N-ACTION response. General status code values and fields related to status code values are defined for N-ACTION DIMSE Service in PS3.7 .

**Table CC.2.1-2. Status Values**

Service Status	Further Meaning	Status Code
Success	The requested state change was performed	0000
Warning	The UPS is already in the requested state of CANCELED	B304
	The UPS is already in the requested state of COMPLETED	B306
Failure	Failed: The UPS may no longer be updated	C300
	Failed: The correct Transaction UID was not provided	C301
	Failed: The UPS is already IN PROGRESS	C302
	Failed: The UPS may only become SCHEDULED via N-CREATE, not N-SET or N-ACTION	C303
	Failed: The UPS has not met final state requirements for the requested state change	C304
	<b>Failed:</b> Specified SOP Instance UID does not exist or is not a UPS Instance managed by this SCP	C307
	Failed: The UPS is not yet in the "IN PROGRESS" state	C310

Change PS3.4 Section CC.2.2.4

### CC.2.2.4 Status Codes

Table CC.2.2-2 defines the status code values that might be returned in a N-ACTION response. General status code values and fields related to status code values are defined for N-ACTION DIMSE Service in PS3.7.

**Table CC.2.2-2. Status Values**

Service Status	Further Meaning	Status Code
Success	The cancel request is acknowledged	0000

Service Status	Further Meaning	Status Code
Warning	The UPS is already in the requested state of CANCELED	B304
Failure	Failed: The UPS is already COMPLETED	C311
	Failed: Performer chooses not to cancel	C313
	<b>Failed:</b> Specified SOP Instance UID does not exist or is not a UPS Instance managed by this SCP	C307
	Failed: The performer cannot be contacted	C312

Change PS3.4 Section CC.2.8.4

## CC.2.8.4 Status Codes

Table CC.2.8-2 defines the status code values that might be returned in a C-FIND response. General status code values and fields related to status code values are defined for C-FIND DIMSE Service in PS3.7.

**Table CC.2.8-2. C-FIND Response Status Values**

Service Status	Further Meaning	Status Codes	Related Fields
Failure	Refused: Out of Resources	A700	(0000,0902)
	Error: Data Set Does Not Match SOP Class	A900	(0000,0901) (0000,0902)
	<b>RefusedFailed:</b> SOP Class not Supported	0122	
	Failed: Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Matching terminated due to Cancel request	FE00	None
Success	Matching is complete - No final Identifier is supplied.	0000	None
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	FF00	Identifier
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence for this Identifier.	FF01	Identifier

### Note

Status Codes are returned in DIMSE response messages (see PS3.7). The code values stated in column "Status Codes" are returned in Status Command Element (0000,0900).

Some Failure Status Codes are implementation specific.

An SCP implementation shall assign specific failure status codes by replacing each 'x' symbol with a hexadecimal digit in the range from 0 to F. An SCP implementation wishing to differentiate between causes of "Failed: Unable to process" Failure Meaning shall assign those causes specific Status Code Values within valid range specified in Table CC.2.8-2.

An SCU implementation shall recognize any Failure Status Code within the value range specified in Table CC.2.8-2 as an indicator of the Failure Meaning stated in the table. There is no requirement for an SCU implementation to differentiate between specific Status Codes within the valid range.

### DD.3.2.1.2 Status

Table DD.3.2.1.2-1 defines the status code values that might be returned in a N-CREATE response. General status code values and fields related to status code values are defined for N-CREATE DIMSE Service in PS3.7.

**Table DD.3.2.1.2-1. RT Ion Machine Verification SOP Class N-CREATE Status Values**

Service Status	Further Meaning	Status Code
Success	Machine Verification successfully created	0000
Failure	Failed: No such object instance - Referenced RT Plan not found	C227
	Failed: The Referenced Fraction Group Number does not exist in the referenced plan	C221
	Failed: No beams exist within the referenced fraction group	C222
	Failed: SCU already verifying and cannot currently process this request.	C223

The status values for N-SET that are specific for these SOP Classes are defined as follows:

**Table DD.3.2.1.2-2. RT Ion Machine Verification SOP Class N-SET Status Values**

Status	Meaning	Code
Success	Machine Verification successfully updated	0000
Failure	<b>Failed:</b> Referenced Beam Number not found within the referenced Fraction Group	C224
	<b>Failed:</b> Referenced device or accessory not supported	C225
	<b>Failed:</b> Referenced device or accessory not found within the referenced beam	C226

### DD.3.2.3.2 Status

Table DD.3.2.3-2 defines the status code values that might be returned in a N-ACTION response. General status code values and fields related to status code values are defined for N-ACTION DIMSE Service in PS3.7.

**Table DD.3.2.3-2. RT Conventional Machine and RT Ion Machine Verification SOP Class N-ACTION Status Values**

Service Status	Further Meaning	Status Code
Success	Machine Parameter Verification of the applicable Machine Verification instance successfully initiated.	0000
Failure	<b>Failed;</b> Machine Verification requested instance not found.	C112

### 9.1.1.1.9 Status

This parameter contains the error or success notification for the operation. It shall be included by the performing DIMSE Service User in the response/confirmation. The following types of status may occur in a response/confirmation (see also Annex C):

- a. Refused: Out of Resources (Status value is Service Class specific) - This indicates that the peer DIMSE Service User was unable to store the composite SOP Instance because it was out of resources.
- b. **RefusedFailed**: SOP Class Not Supported (**0112H0122H**) - This indicates that the peer DIMSE Service User was unable to store the composite SOP Instance because the SOP Class is not supported,
- c. Error: Cannot Understand (Status value is Service Class specific) - This indicates that the peer DIMSE Service User was unable to store the composite SOP Instance because it cannot understand certain Data Elements.
- d. Error: Data Set does not match SOP Class (Status value is Service Class specific) - This indicates that the peer DIMSE Service User was unable to store the composite SOP Instance because the Data Set does not match the SOP Class.
- e. Warning (Status value is Service Class specific) - This indicates that the peer DIMSE Service User was able to store the composite SOP Instance, but detected a probable error.
- f. Success (0000H) - This indicates that the composite SOP Instance was successfully stored.
- g. Duplicate Invocation (0210H) - Indicates that the Message ID (0000,0110) specified is allocated to another notification or operation.
- h. Invalid Object Instance (0117H) - Indicates that the SOP Instance UID specified implied a violation of the UID construction rules.
- i. Mistyped Argument (0212H) - Indicates that one of the parameters supplied has not been agreed for use on the Association between the DIMSE Service Users.
- j. Unrecognized Operation (0211H) - Indicates that the operation is not one of those agreed between the DIMSE Service Users.
- k. Refused: Not Authorized (0124H) - Indicates that the peer DIMSE Service User was not authorized to store the composite SOP Instance.