

DICOM Conformance Statement
for **Side Station i3**
(For Rev.01.01.00 or later)



NO TEXT

Overview:

This conformance statement details the compliance to DICOM 3.0 of Side Station i3 for SONIALVISION G4 system.

Table below provides an overview of the network services supported by the Side Station i3.

NETWORK SERVICES

| SOP Classes | User of Services (SCU) | Provider of Services (SCP) |
|--|-------------------------------|-----------------------------------|
| Transfer | | |
| X-Ray Radiofluoroscopic Image Storage | Yes | No |
| X-Ray Angiographic Image Storage | Yes | No |
| Computed Radiography Image Storage | Yes | No |
| Digital X-Ray Image Storage - For Presentation | Yes | No |
| Digital X-Ray Image Storage - For Processing | Yes | No |
| Storage Commitment | Yes | No |
| Print Management | | |
| Basic Grayscale Print Management Meta | Yes | No |
| Basic Film Session | Yes | No |
| Basic Film Box | Yes | No |
| Basic Grayscale Image Box | Yes | No |
| Printer | Yes | No |
| Print Job | Yes | No |
| Verification | | |
| Verification | Yes | Yes |

Table below provides an overview of the Media Storage Application Profiles supported by the Side Station i3.

MEDIA SERVICES

| Media Storage Application Profile | Write Files (FSC or FSU) | Read Files (FSR) |
|--|---------------------------------|-------------------------|
| DVD | | |
| General Purpose CD-R | Yes | No |

TABLE OF CONTENTS:

1. INTRODUCTION.....5

1.1. REVISION HISTORY5

1.2. AUDIENCE6

1.3. REMARKS6

1.4. TERMS AND DEFINITIONS6

1.5. BASICS OF DICOM COMMUNICATION8

1.6. ABBREVIATIONS.....9

1.7. REFERENCES.....9

2. NETWORKING.....10

2.1. IMPLEMENTATION MODEL10

2.1.1. Application Data Flow10

2.1.2. Functional Definitions of AE's11

2.1.3. Sequencing of Real-World Activities.....11

2.2. AE SPECIFICATIONS12

2.2.1. Storage Application Entity Specification12

2.2.2. Hardcopy Application Entity Specification22

2.2.3. Verification Application Entity Specification33

2.3. NETWORK INTERFACES36

2.3.1. Physical Network Interface36

2.3.2. IPv4 and IPv6 Support36

2.4. CONFIGURATION.....37

2.4.1. AE Title/Presentation Address Mapping37

2.4.2. Parameters38

3. MEDIA INTERCHANGE39

3.1. IMPLEMENTATION MODEL39

3.1.1. Application Data Flow39

3.1.2. Functional Definition of AE's39

3.1.3. Sequencing of Real-World Activities.....39

3.1.4. File Meta Information Options39

3.2. AE SPECIFICATIONS40

3.2.1. Offline-Media Application Entity Specification40

3.3. AUGMENTED AND PRIVATE APPLICATION PROFILES41

3.4. MEDIA CONFIGURATION41

4. SUPPORT OF CHARACTER SETS42

5. SECURITY42

6. ANNEXES43

6.1. IOD CONTENTS43

6.1.1. Created SOP Instances43

6.1.2. Used Fields in received IOD by application63

6.1.3. Attribute mapping.....63

6.1.4. Coerced/Modified Fields63

6.2. DATA DICTIONARY OF PRIVATE ATTRIBUTES64

6.3. CODED TERMINOLOGY AND TEMPLATES.....64

6.4. GRAYSCALE IMAGE CONSISTENCY64

6.5. STANDARD EXTENDED/SPECIALIZED/PRIVATE SOP CLASSES64

6.6. PRIVATE TRANSFER SYNTAXES64

1. INTRODUCTION

1.1. REVISION HISTORY

| Revision | Date | Description |
|-----------------|-------------|---|
| First Edition | 2014/10 | New Release |
| A | 2015/04 | Add Storage Commitment Service |
| B | 2019/09 | Add Verification Service Delete Secondary Capture for Storage Application Entity Modified for SONIALVISION G4 Rev.01.21.00 Add description in case of RAD acquisition Add some Attributes for Storage |
| | | |

1.2. AUDIENCE

This document is written for the people that need to understand how the Side Station i3 will integrate into their healthcare facility. This includes both those responsible for overall imaging network policy and architecture, as well as integrators who need to have a detailed understanding of the DICOM features of the product.

This document contains some basic DICOM definitions so that any reader may understand how this product implements DICOM features. However, integrators are expected to fully understand all the DICOM terminology, how the tables in this document relate to the product's functionality, and how that functionality integrates with other devices that support compatible DICOM features.

1.3. REMARKS

The scope of this DICOM Conformance Statement is to facilitate integration between the Side Station i3 and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard. DICOM by itself does not guarantee interoperability. The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.

This Conformance Statement is not supposed to replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, the user should be aware of the following important issues:

- The comparison of different Conformance Statements is just the first step towards assessing interconnectivity and interoperability between the product and other DICOM conformant equipment.
- Test procedures should be defined and executed to validate the required level of interoperability with specific compatible DICOM equipment, as established by the healthcare facility.

1.4. TERMS AND DEFINITIONS

Informal definitions are provided for the following terms used in this Conformance Statement. The DICOM Standard is the authoritative source for formal definitions of these terms.

Abstract Syntax – the information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class.

Examples : Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.

Application Entity (AE) – an end point of a DICOM information exchange, including the DICOM network or media interface software; i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.

Application Entity Title – the externally known name of an Application Entity, used to identify a DICOM application to other DICOM applications on the network.

Application Context – the specification of the type of communication used between Application Entities. Example: DICOM network protocol.

Association – a network communication channel set up between Application Entities.

Attribute – a unit of information in an object definition; a data element identified by a tag. The information may be a complex data structure (Sequence), itself composed of lower level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).

Information Object Definition (IOD) – the specified set of Attributes that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. The Attributes may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C).

Examples: MR Image IOD, CT Image IOD, Print Job IOD.

Module – a set of Attributes within an Information Object Definition that are logically related to each other.

Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex.

Negotiation – first phase of Association establishment that allows Application Entities to agree on the types of data to be exchanged and how that data will be encoded.

Presentation Context – the set of DICOM network services used over an Association, as negotiated between Application Entities; includes Abstract Syntaxes and Transfer Syntaxes.

Protocol Data Unit (PDU) – a packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.

Service Class Provider (SCP) – role of an Application Entity that provides a DICOM network service; typically, a server that performs operations requested by another Application Entity (Service Class User). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).

Service Class User (SCU) – role of an Application Entity that uses a DICOM network service; typically, a client.

Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU)

Service/Object Pair (SOP) Class – the specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.

Service/Object Pair (SOP) Instance – an information object; a specific occurrence of information exchanged in a SOP Class.

Examples: a specific x-ray image.

Tag – a 32-bit identifier for a data element, represented as a pair of four digit hexadecimal numbers, the “group” and the “element”. If the “group” number is odd, the tag is for a private (manufacturer-specific) data element.

Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element]

Transfer Syntax – the encoding used for exchange of DICOM information objects and messages.

Examples: JPEG compressed (images), little endian explicit value representation.

Unique Identifier (UID) – a globally unique “dotted decimal” string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier.

Examples: Study Instance UID, SOP Class UID, SOP Instance UID.

Value Representation (VR) – the format type of an individual DICOM data element, such as text, an integer, a person’s name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

1.5. BASICS OF DICOM COMMUNICATION

This section describes terminology used in this Conformance Statement for the non-specialist. The key terms used in the Conformance Statement are highlighted in *italics* below. This section is not a substitute for training about DICOM, and it makes many simplifications about the meanings of DICOM terms.

Two *Application Entities* (devices) that want to communicate with each other over a network using DICOM protocol must first agree on several things during an initial network “handshake”. One of the two devices must initiate an *Association* (a connection to the other device), and ask if specific services, information, and encoding can be supported by the other device (*Negotiation*).

DICOM specifies a number of network services and types of information objects, each of which is called an *Abstract Syntax* for the Negotiation. DICOM also specifies a variety of methods for encoding data, denoted *Transfer Syntaxes*. The Negotiation allows the initiating Application Entity to propose combinations of Abstract Syntax and Transfer Syntax to be used on the Association; these combinations are called *Presentation Contexts*. The receiving Application Entity accepts the Presentation Contexts it supports.

For each Presentation Context, the Association Negotiation also allows the devices to agree on *Roles* – which one is the *Service Class User* (SCU - client) and which is the *Service Class Provider* (SCP - server). Normally the device initiating the connection is the SCU, i.e., the client system calls the server, but not always.

The Association Negotiation finally enables exchange of maximum network packet (*PDU*) size, security information, and network service options (called *Extended Negotiation* information).

The Application Entities, having negotiated the Association parameters, may now commence exchanging data. Common data exchanges include queries for worklists and lists of stored images, transfer of image objects and analyses (structured reports), and sending images to film printers. Each exchangeable unit of data is formatted by the sender in accordance with the appropriate *Information Object Definition*, and sent using the negotiated Transfer Syntax. There is a Default Transfer Syntax that all systems must accept, but it may not be the most efficient for some use cases. Each transfer is explicitly acknowledged by the receiver with a *Response Status* indicating success, failure, or that query or retrieve operations are still in process.

Two Application Entities may also communicate with each other by exchanging media (such as a DVD-R). Since there is no Association Negotiation possible, they both use a *Media Application Profile* that specifies “pre-negotiated” exchange media format, Abstract Syntax, and Transfer Syntax.

1.6. ABBREVIATIONS

| | |
|--------|---|
| AE | Application Entity |
| AET | Application Entity Title |
| CR | Computed Radiography |
| CT | Computed Tomography |
| DHCP | Dynamic Host Configuration Protocol |
| DICOM | Digital Imaging and Communications in Medicine |
| DNS | Domain Name System |
| DX | Digital X-ray |
| GSDF | Grayscale Standard Display Function |
| GSPP | Grayscale Softcopy Presentation State |
| HIS | Hospital Information System |
| IHE | Integrating the Healthcare Enterprise |
| IOD | Information Object Definition |
| IPv4 | Internet Protocol version 4 |
| ISO | International Organization for Standardization |
| LDAP | Lightweight Directory Access Protocol |
| LUT | Look-up Table |
| MPPS | Modality Performed Procedure Step |
| MSPS | Modality Scheduled Procedure Step |
| MWL | Modality Worklist |
| NTP | Network Time Protocol |
| PACS | Picture Archiving and Communication System |
| PDU | Protocol Data Unit |
| RF | Radiofluoroscopy |
| RIS | Radiology Information System |
| SCP | Service Class Provider |
| SCU | Service Class User |
| SOP | Service-Object Pair |
| SPS | Scheduled Procedure Step |
| TCP/IP | Transmission Control Protocol/Internet Protocol |
| UL | Upper Layer |
| VM | Value Multiplicity |
| VR | Value Representation |

1.7. REFERENCES

- NEMA PS3 Digital Imaging and Communications in Medicine (DICOM) Standard, available free at <http://dicom.nema.org/>

2. NETWORKING

2.1. IMPLEMENTATION MODEL

2.1.1. Application Data Flow

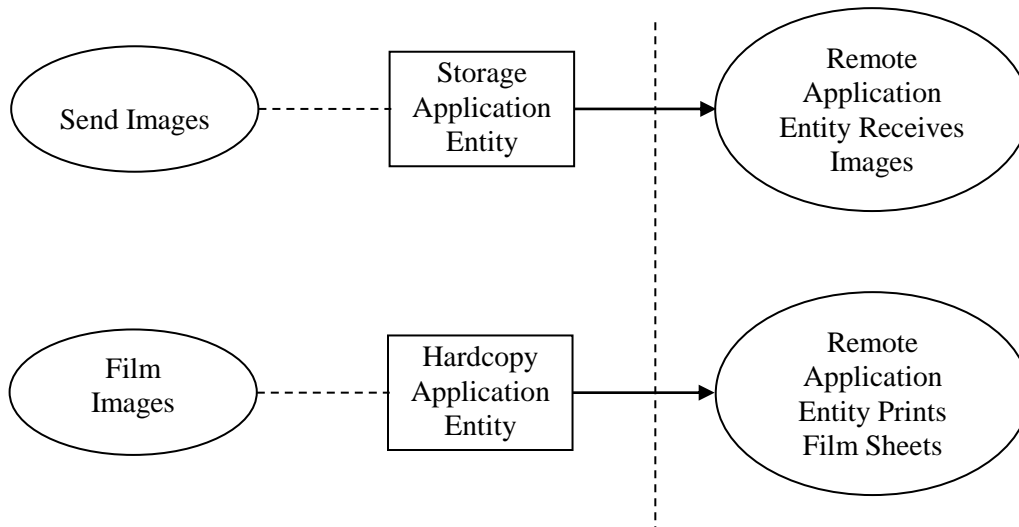


Figure 2.1-1
APPLICATION DATA FLOW DIAGRAM

The Storage Application Entity sends images to a remote AE. It is associated with the local real-world activity “Send Images”. “Send Images” is performed upon user request for each radiography/study or for specific images selected. If the remote AE is configured as Storage Commitment SCP, the Storage AE will request Storage Commitment after sending corresponding image and if a commitment is successfully obtained will record this information in the local database and display its indicator ‘C’ on its Image List.

The Hardcopy Application Entity prints images on a remote AE (Printer). It is associated with the real-world activity “Film Images”. “Film Images” creates a print-job within the print queue containing one or more virtual film sheets composed from images selected by the user.

2.1.2. Functional Definitions of AE's

2.1.2.1. Functional Definition of Storage Application Entity

The existence of a send-job queue entry with associated network destination will activate the Storage AE. An association request is sent to the destination AE and upon successful negotiation of a Presentation Context the image transfer is started. If the association cannot be opened, the related send-job is set to an error state and can be restarted by the user via job control interface. By default, the Storage AE will not try to initiate another association for this send-job automatically.

2.1.2.2. Functional Definition of Hardcopy Application Entity

The existence of a print-job in the print queue will activate the Hardcopy AE. An association is established with the printer and the printer's status determined. If the printer is operating normally, the film sheets described within the print-job will be printed. Changes in printer status will be detected (e.g. out of film) and reported to the user. If the printer is not operating normally, the print-job will set to an error state and can be restarted by the user via the job control interface.

2.1.3. Sequencing of Real-World Activities

There is no intended sequencing.

2.2. AE SPECIFICATIONS

2.2.1. Storage Application Entity Specification

2.2.1.1. SOP Classes

The Side Station i3 provides Standard Conformance to the following SOP Classes:

**Table 2.2-1
SOP CLASSES FOR AE STORAGE**

| SOP Class Name | SOP Class UID | SCU | SCP |
|--|-------------------------------|-----|-----|
| X-Ray Radiofluoroscopic Image Storage | 1.2.840.10008.5.1.4.1.1.12.2 | Yes | No |
| X-Ray Angiographic Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | Yes | No |
| Digital X-Ray Image Storage - For Presentation | 1.2.840.10008.5.1.4.1.1.1.1 | Yes | No |
| Digital X-Ray Image Storage - For Processing | 1.2.840.10008.5.1.4.1.1.1.1.1 | Yes | No |
| Computed Radiography Image Storage | 1.2.840.10008.5.1.4.1.1.1 | Yes | No |
| Storage Commitment Push Model | 1.2.840.10008.1.20.1.1 | Yes | No |

2.2.1.2. Association Policies

2.2.1.2.1. General

The DICOM standard application context name for DICOM 3.0 is always proposed:

**Table 2.2-2
DICOM APPLICATION CONTEXT FOR AE STORAGE**

| | |
|--------------------------|-----------------------|
| Application Context Name | 1.2.840.10008.3.1.1.1 |
|--------------------------|-----------------------|

2.2.1.2.2. Number of Associations

The Side Station i3 initiates one Association at a time for each destination to which a transfer request is being processed in the active job queue list. Only one job will be active at a time, the other remains pending until the active job is completed or failed.

**Table 2.2-3
NUMBER OF ASSOCIATIONS INITIATED FOR AE STORAGE**

| | |
|---|---|
| Maximum number of simultaneous Associations | 1 |
|---|---|

2.2.1.2.3. Asynchronous Nature

The Side Station i3 does not support asynchronous communication (multiple outstanding transactions over a single Association).

Table 2.2-4

ASYNCHRONOUS NATURE AS A SCU FOR AE STORAGE

| | |
|---|---|
| Maximum number of outstanding asynchronous transactions | 1 |
|---|---|

2.2.1.2.4. Implementation Identifying Information

The implementation information for this Application Entity is:

Table 2.2-5

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE STORAGE

| | |
|-----------------------------|--------------------------------------|
| Implementation Class UID | 1.2.392.200036.9110.1.0.6711.2001002 |
| Implementation Version Name | SPF XX (XX : version number) |

2.2.1.3. Association Initiation Policy

2.2.1.3.1. Activity – Send Images

2.2.1.3.1.1. Description and Sequencing of Activities

A user can select images and request them to be sent to multiple destinations. Each request is forwarded to the job queue and processed individually.

The Storage AE is invoked by the job control interface that is responsible for processing network archival tasks. The job consists of data describing the instances marked for storage and the destination. An internal daemon process triggered by a job for a specific network destination initiates a C-STORE request to store images. If the process successfully establishes an Association to a remote Application Entity, it will transfer each marked instance one after another via the open Association. Status of the transfer is reported through the job control interface. Only one job will be active at a time. If the C-STORE Response from the remote Application contains a status other than Success or Warning, the Association is aborted and the related Job is switched to a failed state. It can be restarted any time by user interaction.

The Storage AE attempts to initiate a new Association in order to issue a C-STORE request. If the job contains multiple images then multiple C-STORE requests will be issued over the same Association.

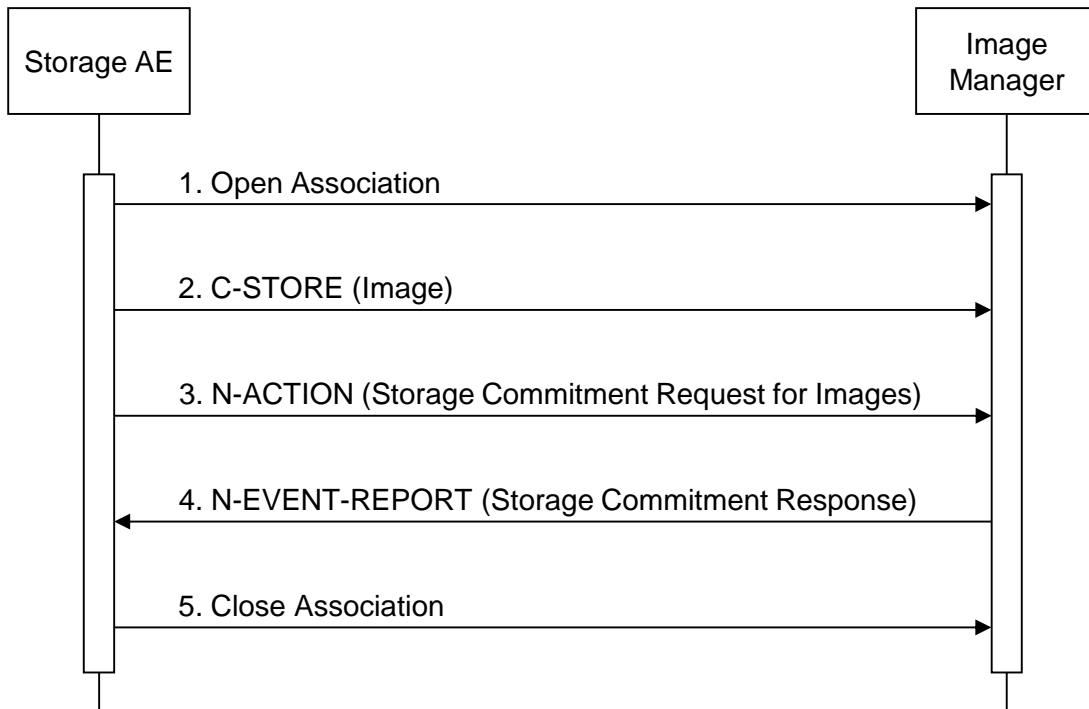


Figure 2.2-1 SEQUENCE OF ACTIVITY – SEND IMAGES

A possible sequence of interactions between the Storage AE and an Image Manager (e.g. a storage or archive device supporting the Storage SOP Class as an SCP) is illustrated in Figure above:

1. The Storage AE opens an association with the Image Manager
2. An acquired image is transmitted to the Image Manager using a C-STORE request and the Image Manager replies with a C-STORE response (status success).
3. An N-ACTION request is transmitted to the Image Manager to obtain commitment of image. The Image Manager replies with an N-ACTION response indicating the request has been received and is being processed.
4. The Image Manager transmits an N-EVENT-REPORT request notifying the Storage AE of the status of the Storage Commitment Request (sent in step3 using the N-ACTION message). The Storage AE replies with an N-EVENT-REPORT response confirming receipt.
5. The Storage AE closes the association with the Image Manager.

NOTE: Many other message sequences are possible depending on the number of images to be stored.

2.2.1.3.1.2. Proposed Presentation Contexts

The Side Station i3 is capable of proposing the Presentation Contexts shown in the following table:

Table 2.2-6

PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY SEND IMAGES

| Presentation Context Table | | | | | |
|--|-------------------------------|---------------------------|---------------------|-------------|------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Ext. Neg. |
| Name | UID | Name | UID | | |
| X-Ray Radio Fluoroscopic Image Storage | 1.2.840.10008.5.1.4.1.1.12.2 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| X-Ray Angiographic Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| Digital X-Ray Image Storage - For Presentation | 1.2.840.10008.5.1.4.1.1.1.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| Digital X-Ray Image Storage - For Processing | 1.2.840.10008.5.1.4.1.1.1.1.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| Computed Radiography Image Storage | 1.2.840.10008.5.1.4.1.1.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| Storage Commitment Push Model | 1.2.840.10008.1.2.0.1.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

Presentation Contexts for each Image Storage will only be proposed if the Send Job contains instances for these SOP Classes.

2.2.1.3.1.3. SOP Specific Conformance Image Storage SOP Classes

All Image Storage SOP Classes supported by the Storage AE exhibit the same behaviour, except where stated, and are described together in this section.

Table 2.2-7

STORAGE C-STORE RESPONSE STATUS HANDLING BEHAVIOUR

| Service Status | Further Meaning | Error Code | Behaviour |
|-----------------------|-----------------------------------|------------------------|--|
| Success | Success | 0000 | The SCP has successfully stored the SOP Instance. If all SOP Instances in a send job have status success then the job is marked as complete. |
| Refused | Out of Resources | A700- A7FF | The Association is released using A-RELEASE and the send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application. This is a transient failure. |
| Error | Data Set does not match SOP Class | A900- A9FF | The Association is released using A-RELEASE and the send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application. |
| Error | Cannot Understand | C000- CFFF | The Association is released using A-RELEASE and the send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application. |
| Warning | Coercion of Data Elements | B000 | Image transmission is considered successful but the status meaning is logged. |
| Warning | Elements Discarded | B006 | Image transmission is considered successful but the status meaning is logged. |
| Warning | Data Set does not match SOP Class | B007 | Image transmission is considered successful. The status meaning is logged and the job warning is reported to the user via the job control application. |
| * | * | Any other status code. | The Association is released using A-RELEASE and the send job is marked as failed. The status code is logged and the job failure is reported to the user via the job control application. |

The behaviour of Storage AE during communication failure is summarized in the Table below:

Table 2.2-8
STORAGE COMMUNICATION FAILURE BEHAVIOUR

| Exception | Behaviour |
|--|---|
| Timeout | The Association is released using A-RELEASE and the send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application. |
| Association aborted by the SCP or network layers | The send job is marked as failed The reason is logged and the job failure is reported to the user via the job control application. |

A failed send job can be restarted by user interaction.

The contents of each Image Storage SOP Instances created by the Side Station i3 conform to the DICOM Image IOD definition and are described in Annex A of this document.

2.2.1.3.1.4. SOP Specific Conformance for Storage Commitment SOP Classes

2.2.1.3.1.4.1. Storage Commitment Operations (N-ACTION)

The Storage AE will request Storage Commitment for instances of any Image Storage SOP Class, if the Remote AE is configured as Storage Commitment SCP.

The Storage AE will consider Storage Commitment failed if no N-EVENT-REPORT is received for a Transaction UID within a configurable time period after receiving a successful N-ACTION response (duration of applicability for a Transaction UID).

The Storage AE does not send the optional Storage Media FileSetID & UID Attributes or the Referenced Study Component Sequence Attributes in the N-ACTION.

The behaviour of Storage AE when encountering status codes in an N-ACTION response is summarized in the Table below:

Table 2.2-9

STORAGE C-STORE RESPONSE STATUS HANDLING BEHAVIOUR

| Service Status | Further Meaning | Error Code | Behaviour |
|----------------|-----------------|------------------------|--|
| Success | Success | 0000 | The request for Storage Commitment is considered successfully sent. A timer is started that will expire if no N-EVENT-REPORT for the Transaction UID is received within a configurable timeout period. |
| * | * | Any other status code. | The Association is released using A-RELEASE and the storage commitment job is marked as failed. The status code is logged and the job failure is reported to the user via the job control application. |

The behaviour of Storage AE during communication failure is summarized in the Table below:

Table 2.2-10

STORAGE COMMITMENT COMMUNICATION FAILURE BEHAVIOUR

| Exception | Behaviour |
|--|---|
| Timeout | The Association is released using A-RELEASE and the send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application. |
| Association aborted by the SCP or network layers | The send job is marked as failed The reason is logged and the job failure is reported to the user via the job control application. |

2.2.1.3.1.4.2. Storage Commitment Notifications (N-EVENT-REPORT)

The Storage AE is capable of receiving an N-EVENT-REPORT notification if it has successfully negotiated a Presentation Context for the Storage Commitment Push Model.

Upon receipt of an N-EVENT-REPORT the timer associated with the Transaction UID will be canceled.

The behavior of Storage AE when receiving Event Types within the N-EVENT-REPORT is summarized in the Table below.

Table 2.2-11

STORAGE COMMITMENT N-EVENT-REPORT BEHAVIOUR

| Event Type Name | Event Type ID | Behaviour |
|--|----------------------|---|
| Storage Commitment Request Successful | 1 | The Referenced SOP Instances under Referenced SOP Sequence (0008,1199) are marked within the database as "Committed (C)". |
| Storage Commitment Request Complete – Failures Exist | 2 | The Referenced SOP Instances under Referenced SOP Sequence (0008,1199) are not marked within the database as "Committed (C)". |

The reason for returning specific status codes in an N-EVENT-REPORT response are summarized in the Table below.

Table 2.2-12

STORAGE COMMITMENT N-EVENT-REPORT RESPONSE STATUS REASONS

| Service Status | Further Meaning | Error Code | Reasons |
|-----------------------|------------------------|------------------------|--|
| Success | Success | 0000 | The Storage Commitment result has been successfully received. |
| * | * | Any other status code. | The Association is released using A-RELEASE and the storage commitment job is marked as failed. The status code is logged and the job failure is reported to the user via the job control application. |

2.2.1.4. Association Acceptance Policy

2.2.1.4.1. Activity – Receive Storage Commitment Response

2.2.1.4.1.1. Description and Sequencing of Activities

The Storage AE will accept associations in order to receive responses to a Storage Commitment Request.

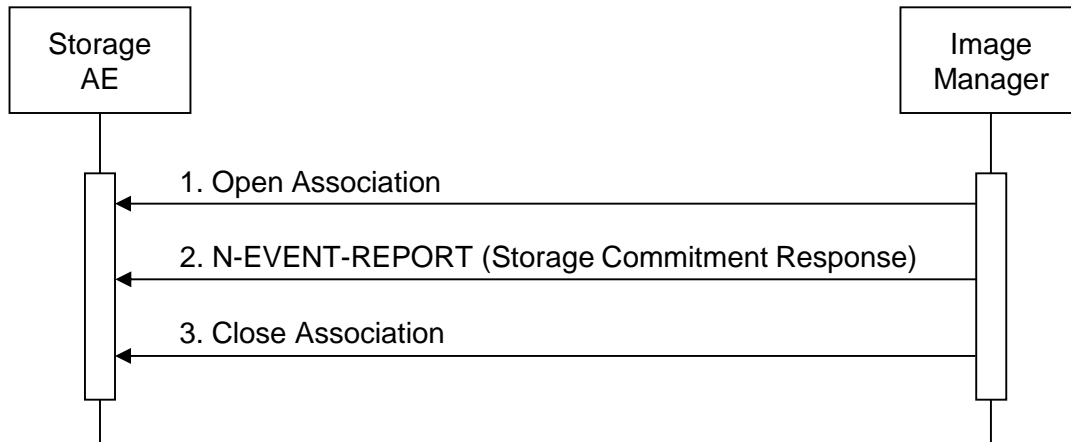


Figure 2.2-2 SEQUENCE OF ACTIVITY – RECEIVE STORAGE COMMITMENT RESPONSE

A possible sequence of interactions between the Storage AE and an Image Manager (e.g. a storage device supporting the Storage Commitment SOP Classes as an SCP) is illustrated in the Figure above.

1. The Image Manager opens a new association with the Storage AE.
2. The Image Manager sends an N-EVENT-REPORT request notifying the Storage AE of the status of a previous Storage Commitment Request. The Storage AE replies within an N-EVENT-REPORT response confirming receipt.
3. The Image Manager closes the association with the Storage AE.

2.2.1.4.1.2. Accepted Presentation Contexts

The Storage AE will accept Presentation Contexts as shown in the Table below.

Table 2.2-13

ACCEPTABLE PRESENTATION CONTEXTS FOR ACTIVITY RECEIVE STORAGE COMMITMENT RESPONSE

| Presentation Context Table | | | | | |
|-----------------------------------|-------------------|---------------------------|---------------------|-------------|------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Ext. Neg. |
| Name | UID | Name | UID | | |
| Storage Commitment Push Model | 1.2.840.10008.1.2 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | 0.1.1 | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

The Storage AE will prefer to select the Explicit VR Little Endian Transfer Syntax if multiple transfer syntaxes are offered. The Storage AE will only accept the SCU role (which must be proposed via SCP/SCU Role Selection Negotiation) within a Presentation Context for the Storage Commitment Push Model SOP Class.

2.2.1.4.1.3. SOP Specific Conformance for Storage Commitment SOP Classes

2.2.1.4.1.3.1. Storage Commitment Notifications (N-EVENT-REPORT)

Under receipt of an N-EVENT-REPORT the timer associated with the Transaction UID will be canceled.

The behavior of Storage AE when receiving Event Types within the N-EVETN-REPORT is summarized in the Table 2.2-11.

2.2.2. Hardcopy Application Entity Specification

2.2.2.1. SOP Classes

The Side Station i3 provides Standard Conformance to the following SOP Classes:

Table 2.2-14
SOP CLASSES FOR AE HARDCOPY

| SOP Class Name | SOP Class UID | SCU | SCP |
|---------------------------------------|------------------------|-----|-----|
| Basic Grayscale Print Management Meta | 1.2.840.10008.5.1.1.9 | Yes | No |
| Basic Film Session | 1.2.840.10008.5.1.1.1 | Yes | No |
| Basic Film Box | 1.2.840.10008.5.1.1.2 | Yes | No |
| Basic Grayscale Image Box | 1.2.840.10008.5.1.1.4 | Yes | No |
| Printer | 1.2.840.10008.5.1.1.16 | Yes | No |
| Print Job | 1.2.840.10008.5.1.1.14 | Yes | No |

2.2.2.2. Association Policies

2.2.2.2.1. General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 2.2-15
DICOM APPLICATION CONTEXT FOR AE HARDCOPY

| | |
|--------------------------|-----------------------|
| Application Context Name | 1.2.840.10008.3.1.1.1 |
|--------------------------|-----------------------|

2.2.2.2.2. Number of Associations

The Side Station i3 initiates one Association at a time for each configured hardcopy device. Multiple hardcopy devices can be configured.

Table 2.2-16
NUMBER OF ASSOCIATIONS INITIATED FOR AE HARDCOPY

| | |
|---|---|
| Maximum number of simultaneous Associations | 1 |
|---|---|

2.2.2.2.3. Asynchronous Nature

The Side Station i3 does not support asynchronous communication (multiple outstanding transactions over a single Association).

Table 2.2-17

ASYNCHRONOUS NATURE AS A SCU FOR AE HARDCOPY

| | |
|---|---|
| Maximum number of outstanding asynchronous transactions | 1 |
|---|---|

2.2.2.2.4. Implementation Identifying Information

The implementation information for this Application Entity is:

Table 2.2-18

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE HARDCOPY

| | |
|-----------------------------|--------------------------------------|
| Implementation Class UID | 1.2.392.200036.9110.1.0.6711.2001002 |
| Implementation Version Name | SPF XX (XX : version number) |

2.2.2.3. Association Initiation Policy

2.2.2.3.1. Activity – Film Images

2.2.2.3.1.1. Description and Sequencing of Activities

A user can compose images onto film sheets and requests them to be sent to a specific hardcopy device. The user can select the desired film format and number of copies. Each print-job is forwarded to the job queue and processed individually.

The Hardcopy AE is invoked by the job control interface that is responsible for processing network tasks. The job consists of data describing the images and graphics to be printed as well as the requested layout and other parameters. Each images on the sheet is sent to the specified device and will be set in the same sheet there. If no association to the printer can be established, the print-job is switched to a failed state and the user informed.

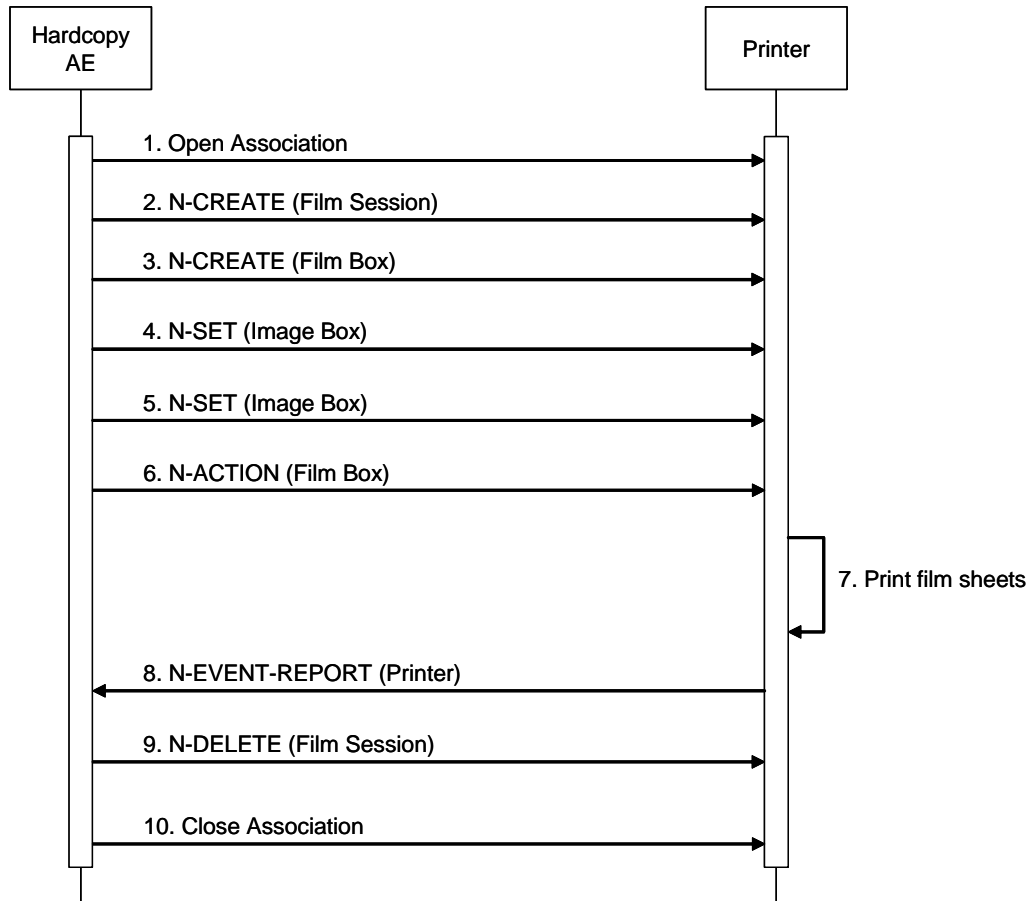


Figure 2.2-3 SEQUENCE OF ACTIVITY – FILM IMAGES

A typical sequence of DIMSE messages sent over an association between Hardcopy AE and a Printer is illustrated in Figure above:

1. Hardcopy AE opens an association with the Printer
2. N-CREATE on the Film Session SOP Class creates a Film Session.
3. N-CREATE on the Film Box SOP Class creates a Film Box linked to the Film Session.
4. N-SET on the Image Box SOP Class transfers image of the film sheet to the printer.
5. N-SET on the Image Box SOP Class transfers another image of the film sheet to the printer.
6. N-ACTION on the Film Box SOP Class instructs the printer to print the Film Box.
7. The printer prints the requested number of film sheets.
8. The Printer asynchronously reports its status via N-EVENT-REPORT notification (Printer SOP Class). The printer can send this message at any time. Hardcopy AE does not require the N-EVENT-REPORT to be sent. Hardcopy AE is capable of receiving an N-EVENT-REPORT notification at any time during an association. If the Printer reports a status of FAILURE, the print-job is switched to a failed status and the user informed.
9. N-DELETE on the Film Session SOP Class deletes the complete Film Session SOP Instance hierarchy.
10. Hardcopy AE closes the association with the Printer.

Status of the print-job is reported through the job control interface. Only one job will be active at a time for each separate hardcopy device. If any Response from the remote Application contains a status other than Success or Warning, the Association is aborted and the related job is switched to a failed state. It can be restarted any time by user interaction.

2.2.2.3.1.2. Proposed Presentation Contexts

The Side Station i3 is capable of proposing the Presentation Contexts shown in the following table:

Table 2.2-19

PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY FILM IMAGES

| Presentation Context Table | | | | | |
|---|----------------------------|---------------------------|---------------------|-------------|------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Ext. Neg. |
| Name | UID | Name | UID | | |
| Basic Grayscale Print Management (META) | 1.2.840.10008.5.1 .1.9 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| Print Job | 1.2.840.10008.5.1 .1.14 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

2.2.2.3.1.3. Common SOP Specific Conformance for all Print SOP Classes

The general behaviour of Hardcopy AE during communication failure is summarized in the Table below. This behaviour is common for all SOP Classes supported by Hardcopy AE.

Table 2.2-20

HARDCOPY COMMUNICATION FAILURE BEHAVIOUR

| Exception | Behaviour |
|--|--|
| Timeout | The Association is released using A-RELEASE and the print-job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application. |
| Association aborted by the SCP or network layers | The print-job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application. |

2.2.2.3.1.4. SOP Specific Conformance for the Printer SOP Class

Hardcopy AE supports the following DIMSE notifications for the Printer SOP Class:

- N-EVENT-REPORT

Details of the supported attributes and status handling behaviour are described in the following subsections.

2.2.2.3.1.4.1. Printer SOP Class Operation (N-EVENT-REPORT)

Hardcopy AE is capable of receiving an N-EVENT-REPORT request at any time during an association.

The behaviour of Hardcopy AE when receiving Event Types within the N-EVENT-REPORT is summarized in the Table below:

Table 2.2-21

PRINTER SOP CLASS N-EVENT-REPORT BEHAVIOUR

| Event Type Name | Event Type ID | Behaviour |
|------------------------|----------------------|--|
| Normal | 1 | The print-job continues to be printed. |
| Warning | 2 | The print-job continues to be printed. The contents of Printer Status Info (2110,0020) is logged and reported to the user via the job-control application. |
| Failure | 3 | The print-job is marked as failed. The contents of Printer Status Info (2110,0020) is logged and reported to the user via the job-control application. |
| * | * | An invalid Event Type ID will cause a status code of 0113H to be returned in a N-EVENT-REPORT response. |

The reasons for returning specific status codes in a N-EVENT-REPORT response are summarized in the Table below:

Table 2.2-22

PRINTER SOP CLASS N-EVENT-REPORT RESPONSE STATUS REASONS

| Service Status | Further Meaning | Error Code | Reasons |
|-----------------------|------------------------|-------------------|---|
| Success | Success | 0000 | The notification event has been successfully received. |
| Failure | No Such Event Type | 0113 | An invalid Event Type ID was supplied in the N-EVENT-REPORT request. |
| Failure | Processing Failure | 0110 | An internal error occurred during processing of the N-EVENT-REPORT. A short description of the error will be returned in Error Comment (0000,0902). |

2.2.2.3.1.5. SOP Specific Conformance for the Film Session SOP Class

Hardcopy AE supports the following DIMSE operations for the Film Session SOP Class:

- N-CREATE
- N-DELETE

Details of the supported attributes and status handling behaviour are described in the following subsections.

2.2.2.3.1.5.1. Film Session SOP Class Operation (N-CREATE)

The attributes supplied in an N-CREATE Request are listed in the Table below:

Table 2.2-23

FILM SESSION SOP CLASS N-CREATE REQUEST ATTRIBUTES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-----------------------|-------------|-----------|--------------|--------------------------|---------------|
| Number of Copies | (2000,0010) | IS | 1 .. | ALWAYS | USER |
| Print Priority | (2000,0020) | CS | | ALWAYS | AUTO |
| Medium Type | (2000,0030) | CS | | ALWAYS | AUTO |
| Film Destination | (2000,0040) | CS | | ALWAYS | AUTO |

The behaviour of Hardcopy AE when encountering status codes in a N-CREATE response is summarized in the Table below:

Table 2.2-24

FILM SESSION SOP CLASS N-CREATE RESPONSE STATUS HANDLING BEHAVIOUR

| Service Status | Further Meaning | Error Code | Reasons |
|-----------------------|------------------------|------------------------|---|
| Success | Success | 0000 | The SCP has completed the operation successfully. |
| * | * | Any other status code. | The Association is released using A-RELEASE and the print-job is marked as failed. The status meaning is logged and reported to the user. |

2.2.2.3.1.5.2. Film Session SOP Class Operation (N-DELETE)

The behaviour of Hardcopy AE when encountering status codes in a N-DELETE response is summarized in the Table below:

Table 2.2-25

FILM SESSION SOP CLASS N-DELETE RESPONSE STATUS HANDLING BEHAVIOUR

| Service Status | Further Meaning | Error Code | Reasons |
|-----------------------|------------------------|------------------------|---|
| Success | Success | 0000 | The SCP has completed the operation successfully. |
| * | * | Any other status code. | The Association is released using A-RELEASE and the print-job is marked as failed. The status meaning is logged and reported to the user. |

2.2.2.3.1.6. SOP Specific Conformance for the Film Box SOP Class

Hardcopy AE supports the following DIMSE operations for the Film Box SOP Class:

- N-CREATE
- N-ACTION

Details of the supported attributes and status handling behaviour are described in the following subsections.

2.2.2.3.1.6.1. Film Box SOP Class Operation (N-CREATE)

The attributes supplied in an N-CREATE Request are listed in the Table below:

**Table 2.2-26
FILM BOX SOP CLASS N-CREATE REQUEST ATTRIBUTES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------------------|-------------|-----------|--------------------|--------------------------|---------------|
| Image Display Format | (2010,0010) | ST | From user input | ALWAYS | USER |
| Film Orientation | (2010,0040) | CS | From user input | ALWAYS | USER |
| Film Size ID | (2010,0050) | CS | From user input | ALWAYS | USER |
| Magnification Type | (2010,0060) | CS | From Configuration | ALWAYS | AUTO |
| Smoothing Type | (2010,0080) | CS | From Configuration | ALWAYS | AUTO |
| Border Density | (2010,0100) | CS | From Configuration | ALWAYS | AUTO |
| Empty Image Density | (2010,0110) | CS | From Configuration | ALWAYS | AUTO |
| Trim | (2010,0140) | CS | From Configuration | ALWAYS | AUTO |
| Configuration Information | (2010,0150) | CS | From Configuration | ALWAYS | AUTO |
| Referenced Film Session Sequence | (2010,0500) | SQ | | ALWAYS | AUTO |
| >Referenced SOP Class UID | (0008,1150) | UI | | ALWAYS | AUTO |
| >Referenced SOP Instance UID | (0008,1155) | UI | | ALWAYS | AUTO |

The behaviour of Hardcopy AE when encountering status codes in a N-CREATE response is summarized in the Table below:

Table 2.2-27

FILM BOX SOP CLASS N-CREATE RESPONSE STATUS HANDLING BEHAVIOUR

| Service Status | Further Meaning | Error Code | Reasons |
|-----------------------|------------------------|------------------------|---|
| Success | Success | 0000 | The SCP has completed the operation successfully. |
| * | * | Any other status code. | The Association is released using A-RELEASE and the print-job is marked as failed. The status meaning is logged and reported to the user. |

2.2.2.3.1.6.2. Film Box SOP Class Operation (N-ACTION)

An N-ACTION Request is issued to instruct the Print SCP to print the contents of the Film Box. The Action Reply argument in an N-ACTION response is not evaluated.

The behaviour of Hardcopy AE when encountering status codes in a N-ACTION response is summarized in the Table below:

Table 2.2-28

FILM BOX SOP CLASS N-ACTION RESPONSE STATUS HANDLING BEHAVIOUR

| Service Status | Further Meaning | Error Code | Reasons |
|-----------------------|------------------------|------------------------|---|
| Success | Success | 0000 | The SCP has completed the operation successfully. The film has been accepted for printing. |
| * | * | Any other status code. | The Association is released using A-RELEASE and the print-job is marked as failed. The status meaning is logged and reported to the user. |

2.2.2.3.1.7. SOP Specific Conformance for the Image Box SOP Class

Hardcopy AE supports the following DIMSE operations for the Image Box SOP Class:

- N-SET

Details of the supported attributes and status handling behaviour are described in the following subsections.

2.2.2.3.1.7.1. Image Box SOP Class Operation (N-SET)

The attributes supplied in an N-SET Request are listed in the Table below:

**Table 2.2-29
IMAGE BOX SOP CLASS N-SET REQUEST ATTRIBUTES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--------------------------------|-------------|----|---------------------------|-------------------|--------|
| Image Box Position | (2020,0010) | US | Depends on image position | ALWAYS | AUTO |
| Basic Grayscale Image Sequence | (2020,0110) | SQ | | ALWAYS | AUTO |
| >Samples Per Pixel | (0028,0002) | US | “1” | ALWAYS | AUTO |
| >Photometric Interpretation | (0028,0004) | CS | “MONOCHROME2” | ALWAYS | AUTO |
| >Rows | (0028,0010) | US | Depends on image size | ALWAYS | AUTO |
| >Columns | (0028,0011) | US | Depends on image size | ALWAYS | AUTO |
| >Bits Allocated | (0028,0100) | US | From Configuration | ALWAYS | AUTO |
| >Bits Stored | (0028,0101) | US | From Configuration | ALWAYS | AUTO |
| >High Bit | (0028,0102) | US | From Configuration | ALWAYS | AUTO |
| >Pixel Representation | (0028,0103) | US | “0” | ALWAYS | AUTO |
| >Pixel Data | (7FE0,0010) | OW | Pixels of rendered image | ALWAYS | AUTO |

The behaviour of Hardcopy AE when encountering status codes in a N-SET response is summarized in the Table below:

Table 2.2-30

IMAGE BOX SOP CLASS N-SET RESPONSE STATUS HANDLING BEHAVIOUR

| Service Status | Further Meaning | Error Code | Reasons |
|-----------------------|------------------------|------------------------|---|
| Success | Success | 0000 | The SCP has completed the operation successfully. Image successfully stored in Image Box. |
| * | * | Any other status code. | The Association is released using A-RELEASE and the print-job is marked as failed. The status meaning is logged and reported to the user. |

2.2.3. Verification Application Entity Specification

2.2.3.1. SOP Classes

The Side Station i3 provides Standard Conformance to the following SOP Classes:

Table 2.2-31

SOP CLASSES FOR AE VERIFICATION

| SOP Class Name | SOP Class UID | SCU | SCP |
|----------------|-------------------|-----|-----|
| Verification | 1.2.840.10008.1.1 | Yes | Yes |

2.2.3.2. Association Policies

2.2.3.2.1. General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 2.2-32

DICOM APPLICATION CONTEXT FOR AE STORAGE

| | |
|--------------------------|-----------------------|
| Application Context Name | 1.2.840.10008.3.1.1.1 |
|--------------------------|-----------------------|

2.2.3.2.2. Number of Associations

The Side Station i3 initiates one Association at a time for each destination to which a transfer request is being processed in the active job queue list. Only one job will be active at a time, the other remains pending until the active job is completed or failed.

Table 2.2-33

NUMBER OF ASSOCIATIONS INITIATED FOR AE STORAGE

| | |
|---|---|
| Maximum number of simultaneous Associations | 1 |
|---|---|

2.2.3.2.3. Asynchronous Nature

The Side Station i3 does not support asynchronous communication (multiple outstanding transactions over a single Association).

Table 2.2-34

ASYNCHRONOUS NATURE AS A SCU FOR AE STORAGE

| | |
|---|---|
| Maximum number of outstanding asynchronous transactions | 1 |
|---|---|

2.2.3.2.4. Implementation Identifying Information

The implementation information for this Application Entity is:

Table 2.2-35

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE STORAGE

| | |
|-----------------------------|--------------------------------------|
| Implementation Class UID | 1.2.392.200036.9110.1.0.6711.2001002 |
| Implementation Version Name | SPF XX (XX : version number) |

2.2.3.3. Association Initiation Policy

2.2.3.3.1. Activity – Verification

2.2.3.3.1.1. Description and Sequencing of Activities

Service personnel can select servers in the maintenance tool to check the connectivity.

The verification AE is invoked by activating [ECHO] by the service personnel. It will send verification message to the selected server and display its verification result notified by the server.

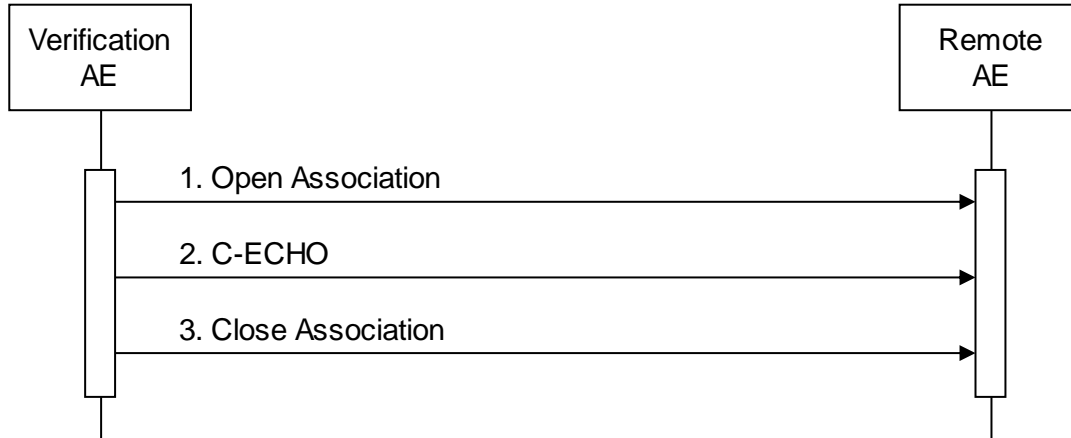


Figure 2.2-4 SEQUENCE OF ACTIVITY – VERIFICATION

A possible sequence of interactions between the Verification AE and a Remote AE (e.g. a storage or archive device supporting the Verification SOP Class as an SCP) is illustrated in Figure above:

1. The Verification AE opens an association with the Remote AE.
2. A C-ECHO message is transmitted to the Remote AE and the Remote AE replies with C-ECHO response.
3. The Verification AE closes the association with the Remote AE.

2.2.3.3.1.2. Proposed Presentation Contexts

The Side Station i3 is capable of proposing the Presentation Contexts shown in the following table:

Table 2.2-36

PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY VERIFICATION

| Presentation Context Table | | | | | |
|-----------------------------------|-------------------|---------------------------|---------------------|-------------|------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Ext. Neg. |
| Name | UID | Name | UID | | |
| Verification | 1.2.840.10008.1.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

2.2.3.3.1.3. SOP Specific Conformance Verification SOP Classes

The Side Station i3 provides standard conformance to the DICOM Verification Service Class as SCU. The status code for the C-ECHO is as follows;

Table 2.2-37

C-ECHO RESPONSE STATUS HANDLING BEHAVIOUR

| Service Status | Further Meaning | Error Code | Behaviour |
|-----------------------|------------------------|-------------------|--|
| Success | Success | 0000 | The SCP has successfully responded the C-ECHO. |

The behaviour of Verification AE during communication failure is summarized in the Table below:

Table 2.2-38

VERIFICATION COMMUNICATION FAILURE BEHAVIOUR

| Exception | Behaviour |
|--|--|
| Timeout | The Association is released using A-RELEASE. The reason is logged and the job failure is reported to the service personnel via the maintenance tool. |
| Association aborted by the SCP or network layers | The reason is logged and the job failure is reported to the service personnel via the maintenance tool. |

2.3. NETWORK INTERFACES

2.3.1. Physical Network Interface

The Side Station i3 supports a single network interface. One of the following physical network interfaces will be available depending on installed hardware options:

Table 2.3-1

SUPPORTED PHYSICAL NETWORK INTERFACES

| |
|---------------------|
| Ethernet 1000baseT |
| Ethernet 100base-TX |

2.3.2. IPv4 and IPv6 Support

This product only supports IPv4 connections.

2.4. CONFIGURATION

2.4.1. AE Title/Presentation Address Mapping

2.4.1.1. Local AE Titles

All local applications use the AE Titles and TCP/IP Ports configured via the Service Tool. The default AE Titles is listed below.

Table 2.4-1
AE TITLE CONFIGURABLE TABLE

| Application Entity | Default AE Title | Default TCP/IP Port |
|---------------------------|-------------------------|----------------------------|
| Storage | G4WS_StoreSCU | |
| Hardcopy | G4WS_PrintSCU | |

2.4.1.2. Remote AE Title/Presentation Address Mapping

The AE Title, host names and port numbers of remote applications are configured using the Side Station i3 Service Tool.

2.4.1.2.1. Storage

The Side Station i3 Service Tool must be used to set the AE Titles, port-numbers, host-names and capabilities for the remote Storage SCPs. Associations will only be accepted from known AE Titles and associations from unknown AE Titles will be rejected (an AE Title is known if it can be selected within the Service Tool). Multiple remote Storage SCPs can be defined.

2.4.1.2.2. Hardcopy

The Side Station i3 Service Tool must be used to set the AE Titles, port-numbers, host-names and capabilities for the remote Print SCPs. Multiple remote Print SCPs can be defined.

2.4.2. Parameters

A large number of parameters related to acquisition and general operation can be configured using the Service Tool. The Table below only shows those configuration parameters relevant to DICOM communication. See the Side Station i3 Service Manual for details on general configuration capabilities.

Table 2.4-2
CONFIGURATION PARAMETERS TABLE

| Parameter | Configurable (Yes/No) | Default Value |
|---|----------------------------------|----------------------|
| General Parameters | | |
| PDU Size | Yes | 16kB |
| Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout) | No | None |
| General DIMSE level time-out values | No | None |
| Time-out waiting for response to TCP/IP connect request. (Low-level timeout) | No | None |
| Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout) | No | None |
| Time-out for waiting for data between TCP/IP packets. (Low-level timeout) | No | None |
| Any changes to default TCP/IP settings, such as configurable stack parameters. | No | None |

3. MEDIA INTERCHANGE

3.1. IMPLEMENTATION MODEL

3.1.1. Application Data Flow

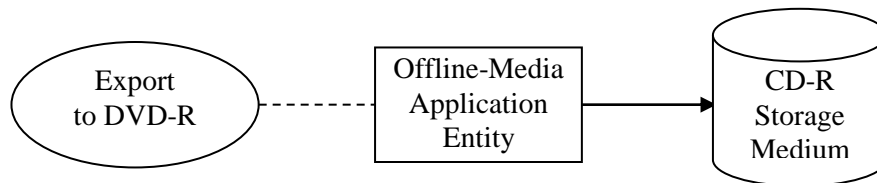


Figure 3.1-1 APPLICATION DATA FLOW DIAGRAM FOR MEDIA STORAGE

The Offline-Media Application Entity exports images to a DVD-R Storage medium. It is associated with the local real-world activity “Export to DVD-R”. “Export to DVD-R” is performed upon user request for selected patients, studies, series, or images.

3.1.2. Functional Definition of AE’s

3.1.2.1. Functional Definition of Offline-Media Application Entity

Activation of the “Export to DVD-R” menu entry will pass the currently selected patients, studies, series or images to the Offline-Media Application Entity. The SCP Instances associated with the selection will be collected into one or more export jobs. The contents of each export job will be written to a single DVD-R media.

3.1.3. Sequencing of Real-World Activities

At least one image must exist and be selected before the Offline-Media Application Entity can be invoked. The operator can insert a new DVD-R media at any time before or after invocation of the Offline-Media Application Entity. The Offline-Media Application Entity will wait indefinitely for a media to be inserted before starting to write to the DVD-R device. If no DVD-R media is available the export job can be canceled from the job queue.

3.1.4. File Meta Information Options

The implementation information written to the File Meta Header in each file is:

Table 3.1-1

DICOM IMPLEMENTATION CLASS AND VERSION FOR MEDIA STORAGE

| | |
|-----------------------------|--------------------------------------|
| Implementation Class UID | 1.2.392.200036.9110.1.0.6711.2001002 |
| Implementation Version Name | SPF XX (XX : version number) |

3.2. AE SPECIFICATIONS

3.2.1. Offline-Media Application Entity Specification

The Offline-Media Application Entity provides standard conformance to the Media Storage Service Class. The Application Profiles and roles are listed below:

Table 3.2-1

APPLICATION PROFILES, ACTIVITIES AND ROLES FOR OFFLINE-MEDIA

| Application Profiles Supported | Real World Activity | Role | |
|--------------------------------|---------------------|------|--|
| STD-GEN-CD | Export to CD-R | FSC | |

3.2.1.1. File Meta Information for the Application Entity

The Source Application Entity Title included in the File Meta Header is fixed (see section 3.4).

3.2.1.2. Real-World Activities

3.2.1.2.1. Activity – Export to DVD-R

The Offline-Media Application Entity acts as an FSC when requested to export SOP Instances from the local database to a DVD-R medium.

A dialogue will be presented informing the user about the required / available media capacity. If the contents of the current selection do not fit on a single media selection will be canceled and ask the user to select SOP Instances again.

The user will be prompted to insert a DVD-R media which is empty or written in this system for each export job. The contents of the export job will be written together with a corresponding DICOMDIR. The user can cancel an export job in the job queue.

3.2.1.2.1.1. Media Storage Application Profiles

The Offline-Media Application Entity supports the STD-GEN-CD Application Profile.

3.2.1.2.1.1.1. Options

The Offline-Media Application Entity supports the SOP Classes and Transfer Syntaxes listed in the Table below:

**Table 3.2-2
IODS, SOP CLASSES AND TRANSFER SYNTAXES FOR OFFLINEMEDIA**

| Information Object Definition | SOP Class UID | Transfer Syntax | Transfer Syntax UID |
|--|-------------------------------|---------------------------|----------------------------|
| Media Storage Directory Storage | 1.2.840.10008.1.3.10 | Explicit VR Little Endian | 1.2.840.10008.1.2.1 |
| X-Ray Radio Fluoroscopic Image Storage | 1.2.840.10008.5.1.4.1.1.12.2 | Explicit VR Little Endian | 1.2.840.10008.1.2.1 |
| X-Ray Angiographic Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | Explicit VR Little Endian | 1.2.840.10008.1.2.1 |
| Digital X-Ray Image Storage - For Presentation | 1.2.840.10008.5.1.4.1.1.1.1 | Explicit VR Little Endian | 1.2.840.10008.1.2.1 |
| Digital X-Ray Image Storage - For Processing | 1.2.840.10008.5.1.4.1.1.1.1.1 | Explicit VR Little Endian | 1.2.840.10008.1.2.1 |
| Computed Radiography Image Storage | 1.2.840.10008.5.1.4.1.1.1 | Explicit VR Little Endian | 1.2.840.10008.1.2.1 |

3.3. AUGMENTED AND PRIVATE APPLICATION PROFILES

The Side Station i3 does not support any augmented for private application profiles.

3.4. MEDIA CONFIGURATION

All local applications use the fixed AE Title listed in the Table below:

**Table 3.4-1
AE TITLE CONFIGURATION TABLE**

| Application Entity | Default AE Title |
|---------------------------|-------------------------|
| Offline-Media | G4WS-0000000000 |

4. SUPPORT OF CHARACTER SETS

All the Side Station i3 applications support the following character sets:

ISO_IR 100 (ISO 8859-1:1987 Latin Alphabet No.1 supplementary set)

ISO 2022 IR 87 (JIS X 0208: Kanji)

ISO 2022 IR 159 (JIS X 0212: Supplementary Kanji set)

The Side Station i3 will set the corresponding character set based on its configuration as listed below:

Table 3.4-1
CHARACTER SET

| Configuration | Character Set |
|----------------------|--|
| English mode | ISO_IR 100 |
| Japanese mode | \ISO 2022 IR 87\ISO 2022 IR 159 or \ISO 2022 IR 87 |

5. SECURITY

The Side Station i3 does not support any specific security measures.

It is assumed that the Side Station i3 is used within a secured environment. It is assumed that a secured environment includes at a minimum:

- a. Firewall or router protections to ensure that only approved external hosts have network access to the Side Station i3.
- b. Firewall or router protections to ensure that the Side Station i3 only has network access to approved external hosts and services.
- c. Any communication with external hosts and services outside the locally secured environment use appropriate secure network channels (e.g. such as a Virtual Private Network (VPN)).

Other network security procedures such as automated intrusion detection may be appropriate in some environments. Additional security features may be established by the local security policy and are beyond the scope of this conformance statement.

6. ANNEXES

6.1. IOD CONTENTS

6.1.1. Created SOP Instances

The attributes of each IODs transmitted by the Side Station i3 storage application are specified in the Table listed below:

Table 6.1-1
ATTRIBUTES FOR EACH IOD

| IOD | Specified Table |
|--|------------------------|
| X-Ray Radio Fluoroscopic Image IOD | Table 6.1-2 |
| X-Ray Angiographic Image IOD | Table 6.1-3 |
| Digital X-Ray Image IOD - For Presentation | Table 6.1-4 |
| Digital X-Ray Image IOD - For Processing | Table 6.1-4 |
| Computed Radiography Image IOD | Table 6.1-5 |

The following tables use a number of abbreviations. The abbreviations used in the “Presence of Module” column are:

| | |
|--------|--|
| VNAP | Value Not Always Present (attribute sent zero length if no value is present) |
| ANAP | Attribute Not Always Present |
| ALWAYS | Always Present |
| EMPTY | Attribute is sent without a value |

The abbreviations used in the “Source” column are:

| | |
|--------|---|
| MWL | the attribute value source Modality Worklist |
| USER | the attribute value source is from User input |
| AUTO | the attribute value is generated automatically |
| MPPS | the attribute value is the same as that use for Modality Performed Procedure Step |
| CONFIG | the attribute value source is a configurable parameter |

NOTE: All dates and times are encoded in the local configured calendar and time. Date, Time and Time zone are configured using the Windows Date and Time configuration.

6.1.1.1. X-Ray Radio Fluoroscopic Image IOD

**Table 6.1-2
IOD OF CREATED RF SOP INSTANCES**

| IE | Module | Reference | Presence of Module |
|------------|-------------------|------------------|---------------------------|
| Patient | Patient | Table 6.1-6 | ALWAYS |
| Study | General Study | Table 6.1-7 | ALWAYS |
| | Patient Study | Table 6.1-8 | ALWAYS |
| Series | General Series | Table 6.1-9 | ALWAYS |
| Equipment | General Equipment | Table 6.1-12 | ALWAYS |
| Image | General Image | Table 6.1-13 | ALWAYS |
| | Image Pixel | Table 6.1-14 | ALWAYS |
| | Contrast/Bolus | Table 6.1-15 | ALWAYS |
| | Cine | Table 6.1-16 | Only if Multi-frame |
| | Multi-frame | Table 6.1-17 | Only if Multi-frame |
| | Frame Pointers | Table 6.1-18 | Only if Multi-frame |
| | Mask | Table 6.1-19 | Only if subtracted image |
| | Display Shutter | Table 6.1-20 | ALWAYS |
| | X-Ray Image | Table 6.1-22 | ALWAYS |
| | X-Ray Acquisition | Table 6.1-23 | ALWAYS |
| | X-Ray Collimator | Table 6.1-24 | ALWAYS |
| | XRF Positioner | Table 6.1-25 | ALWAYS |
| | VOI LUT | Table 6.1-26 | ALWAYS |
| SOP Common | Table 6.1-33 | ALWAYS | |

6.1.1.2. X-Ray Angiographic Image IOD

**Table 6.1-3
IOD OF CREATED XA SOP INSTANCES**

| IE | Module | Reference | Presence of Module |
|------------|-------------------|------------------|---------------------------|
| Patient | Patient | Table 6.1-6 | ALWAYS |
| Study | General Study | Table 6.1-7 | ALWAYS |
| | Patient Study | Table 6.1-8 | ALWAYS |
| Series | General Series | Table 6.1-9 | ALWAYS |
| Equipment | General Equipment | Table 6.1-12 | ALWAYS |
| Image | General Image | Table 6.1-13 | ALWAYS |
| | Image Pixel | Table 6.1-14 | ALWAYS |
| | Contrast/Bolus | Table 6.1-15 | ALWAYS |
| | Cine | Table 6.1-16 | Only if Multi-frame |
| | Multi-frame | Table 6.1-17 | Only if Multi-frame |
| | Frame Pointers | Table 6.1-18 | Only if Multi-frame |
| | Mask | Table 6.1-19 | Only if subtracted image |
| | Display Shutter | Table 6.1-20 | ALWAYS |
| | X-Ray Image | Table 6.1-22 | ALWAYS |
| | X-Ray Acquisition | Table 6.1-23 | ALWAYS |
| | X-Ray Collimator | Table 6.1-24 | ALWAYS |
| | VOI LUT | Table 6.1-26 | ALWAYS |
| | XA Positioner | Table 6.1-28 | ALWAYS |
| SOP Common | Table 6.1-33 | ALWAYS | |

6.1.1.3. Digital X-Ray Image IOD

**Table 6.1-4
IOD OF CREATED DX SOP INSTANCES**

| IE | Module | Reference | Presence of Module |
|-----------|------------------------|------------------|---------------------------|
| Patient | Patient | Table 6.1-6 | ALWAYS |
| Study | General Study | Table 6.1-7 | ALWAYS |
| | Patient Study | Table 6.1-8 | ALWAYS |
| Series | General Series | Table 6.1-9 | ALWAYS |
| | DX Series | Table 6.1-11 | ALWAYS |
| Equipment | General Equipment | Table 6.1-12 | ALWAYS |
| Image | General Image | Table 6.1-13 | ALWAYS |
| | Image Pixel | Table 6.1-14 | ALWAYS |
| | Contrast/Bolus | Table 6.1-15 | ALWAYS |
| | Display Shutter | Table 6.1-20 | ALWAYS |
| | X-Ray Collimator | Table 6.1-24 | ALWAYS |
| | VOI LUT | Table 6.1-26 | ALWAYS |
| | X-Ray Acquisition Dose | Table 6.1-27 | ALWAYS |
| | DX Anatomy Imaged | Table 6.1-29 | ALWAYS |
| | DX Image | Table 6.1-30 | ALWAYS |
| | DX Detector | Table 6.1-31 | ALWYAS |
| | Acquisition Context | Table 6.1-32 | ALWAYS |
| | SOP Common | Table 6.1-33 | ALWAYS |

6.1.1.4. Computed Radiography Image IOD

**Table 6.1-5
IOD OF CREATED CR SOP INSTANCES**

| IE | Module | Reference | Presence of Module |
|-----------|-------------------|------------------|---------------------------|
| Patient | Patient | Table 6.1-6 | ALWAYS |
| Study | General Study | Table 6.1-7 | ALWAYS |
| | Patient Study | Table 6.1-8 | ALWAYS |
| Series | General Series | Table 6.1-9 | ALWAYS |
| | CR Series | Table 6.1-10 | ALWAYS |
| Equipment | General Equipment | Table 6.1-12 | ALWAYS |
| Image | General Image | Table 6.1-13 | ALWAYS |
| | Image Pixel | Table 6.1-14 | ALWAYS |
| | Display Shutter | Table 6.1-20 | ALWAYS |
| | CR Image | Table 6.1-21 | ALWAYS |
| | VOI LUT | Table 6.1-26 | ALWAYS |
| | SOP Common | Table 6.1-33 | ALWAYS |

6.1.1.5. Modules

6.1.1.5.1. Patient Module

Table 6.1-6

PATIENT MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------|-------------|----|----------|-------------------|--------|
| Patient's Name | (0010,0010) | PN | Original | ALWAYS | AUTO |
| Patient ID | (0010,0020) | LO | Original | ALWAYS | AUTO |
| Patient's Birth Date | (0010,0030) | DA | Original | VNAP | AUTO |
| Patient's Sex | (0010,0040) | CS | Original | VNAP | AUTO |
| Patient Comments | (0010,4000) | LT | Original | VNAP | AUTO |

6.1.1.5.2. General Study Module

Table 6.1-7

GENERAL STUDY MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------------------|-------------|----|----------|-------------------|--------|
| Study Date | (0008,0020) | DA | Original | ALWAYS | AUTO |
| Study Time | (0008,0030) | TM | Original | ALWAYS | AUTO |
| Accession Number | (0008,0050) | SH | Original | VNAP | AUTO |
| Referring Physician's Name | (0008,0090) | PN | Original | VNAP | AUTO |
| Study Description | (0008,1030) | LO | Original | ALWAYS | AUTO |
| Physician(s) of Record | (0008,1048) | PN | Original | ANAP | AUTO |
| Name of Physician(s) Reading Study | (0008,1060) | PN | Original | ANAP | AUTO |
| Study Instance UID | (0020,000D) | UI | Original | ALWAYS | AUTO |
| Study ID | (0020,0010) | SH | Original | ALWAYS | AUTO |

6.1.1.5.3. Patient Study Module

Table 6.1-8

PATIENT STUDY MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-----------------------|-------------|-----------|--------------|--------------------------|---------------|
| Patient's Age | (0010,1010) | AS | Original | VNAP | AUTO |
| Patient's Size | (0010,1020) | DS | Original | VNAP | AUTO |
| Patient's Weight | (0010,1030) | DS | Original | VNAP | AUTO |

6.1.1.5.4. General Series Module

Table 6.1-9

GENERAL SERIES MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-----------------------------|-------------|-----------|--------------|--------------------------|---------------|
| Series Date | (0008,0021) | DA | Original | ALWAYS | AUTO |
| Series Time | (0008,0031) | TM | Original | ALWAYS | AUTO |
| Modality | (0008,0060) | CS | Original | ALWAYS | AUTO |
| Series Description | (0008,103E) | LO | Original | ALWAYS | AUTO |
| Performing Physician's Name | (0008,1050) | PN | Original | ANAP | AUTO |
| Operator's Name | (0008,1070) | PN | Original | ANAP | AUTO |
| Body Part Examined | (0018,0015) | CS | Original | VNAP | AUTO |
| Protocol Name | (0018,1030) | LO | Original | ALWAYS | AUTO |
| Series Instance UID | (0020,000E) | UI | Original | ALWAYS | AUTO |
| Series Number | (0020,0011) | IS | Original | ALWAYS | AUTO |
| Laterality | (0020,0060) | CS | Original | ANAP | AUTO |

6.1.1.5.5. CR Series Module

Table 6.1-10

CR SERIES MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-----------------------|-------------|-----------|--------------|--------------------------|---------------|
| Modality | (0008,0060) | CS | Original | ALWAYS | AUTO |
| Body Part Examined | (0018,0015) | CS | Original | VNAP | AUTO |
| View Position | (0018,5101) | CS | Original | EMPTY | AUTO |

6.1.1.5.6. DX Series Module

Table 6.1-11

DX SERIES MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--|-------------|-----------|--------------|--------------------------|---------------|
| Modality | (0008,0060) | CS | Original | ALWAYS | AUTO |
| Presentation Intent Type | (0008,0068) | CS | Original | ALWAYS | AUTO |
| Referenced Performed Procedure Step Sequence | (0008,1111) | SQ | Original | ANAP | AUTO |
| >Referenced SOP Class UID | (0008,1150) | UI | Original | ANAP | AUTO |
| >Referenced SOP Instance UID | (0008,1155) | UI | Original | ANAP | AUTO |

6.1.1.5.7. General Equipment Module

Table 6.1-12

GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-----------------------------|-------------|-----------|--------------------|--------------------------|---------------|
| Manufacturer | (0008,0070) | LO | Original | ALWAYS | AUTO |
| Institution Name | (0008,0080) | LO | Original | VNAP | AUTO |
| Institution Address | (0008,0081) | ST | Original | VNAP | AUTO |
| Station Name | (0008,1010) | SH | Original | VNAP | AUTO |
| Institution Department Name | (0008,1040) | LO | Original | ALWAYS | AUTO |
| Manufacturer's Model Name | (0008,1090) | LO | "Side Station i3" | ALWAYS | AUTO |
| Device Serial Number | (0018,1000) | LO | From Configuration | ALWAYS | CONFIG |
| Software Versions | (0018,1020) | LO | From Configuration | ALWAYS | CONFIG |

6.1.1.5.8. General Image Module

Table 6.1-13

GENERAL IMAGE MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------------|-------------|-----------|--------------|--------------------------|---------------|
| Acquisition Date | (0008,0022) | DA | Original | ALWAYS | AUTO |
| Content Date | (0008,0023) | DA | Original | ALWAYS | AUTO |
| Acquisition Time | (0008,0032) | TM | Original | ALWAYS | AUTO |
| Content Time | (0008,0033) | TM | Original | ALWAYS | AUTO |
| Source Image Sequence | (0008,2112) | SQ | Original | ANAP | AUTO |
| >Referenced SOP Class UID | (0008,1150) | UI | Original | ANAP | AUTO |
| >Referenced SOP Instance UID | (0008,1155) | UI | Original | ANAP | AUTO |
| >Referenced Frame Number | (0008,1160) | IS | Original | ANAP | AUTO |
| Acquisition Number | (0020,0012) | IS | Original | ALWAYS | AUTO |
| Instance Number | (0020,0013) | IS | Original | ALWAYS | AUTO |
| Patient Orientation | (0020,0020) | CS | Original | VNAP | AUTO |
| Image Comments | (0020,4000) | LT | Original | ANAP | AUTO |
| Burned In Annotation | (0028,0301) | CS | Original | ANAP | AUTO |

6.1.1.5.9. Image Pixel Module

Table 6.1-14

IMAGE PIXEL MODULE OF CREATED SOP INSTANCES

In case of SC;

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------------|-------------|-----------|--------------|--------------------------|---------------|
| Samples per Pixel | (0028,0002) | US | “3” | ALWAYS | AUTO |
| Photometric Interpretation | (0028,0004) | CS | “RGB” | ALWAYS | AUTO |
| Planar Configuration | (0028,0006) | US | “0” | ALWAYS | AUTO |
| Bits Allocated | (0028,0100) | US | “8” | ALWAYS | AUTO |
| Bits Stored | (0028,0101) | US | “8” | ALWAYS | AUTO |
| High Bits | (0028,0102) | US | “7” | ALWAYS | AUTO |
| Pixel Representation | (0028,0103) | US | “0” | ALWAYS | AUTO |

Other cases than above;

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-----------------------|-------------|-----------|--------------------------------|--------------------------|---------------|
| Rows | (0028,0010) | US | Number of rows in the image | ALWAYS | AUTO |
| Columns | (0028,0011) | US | Number of columns in the image | ALWAYS | AUTO |
| Pixel Aspect Ratio | (0028,0034) | IS | “1\1” | ALWAYS | AUTO |
| Pixel Data | (7FE0,0010) | OW | The Pixel Data itself | ALWAYS | AUTO |

6.1.1.5.10. Contrast/Bolus Module**Table 6.1-15****CONTRAST/BOLUS MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---------------------------|-------------|-----------|--------------|--------------------------|---------------|
| Contrast/Bolus Agent | (0018,0010) | LO | Original | EMPTY | AUTO |
| Contrast/Bolus Start Time | (0018,1042) | TM | Original | ANAP | AUTO |

6.1.1.5.11. Cine Module**Table 6.1-16****CINE MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--------------------------------|-------------|-----------|--------------|--------------------------|---------------|
| Recommended Display Frame Rate | (0008,2144) | IS | Original | ANAP | AUTO |
| Cine Rate | (0018,0040) | IS | Original | ANAP | AUTO |
| Frame Time Vector | (0018,1065) | DS | Original | ANAP | AUTO |

6.1.1.5.12. Multi-Frame Module**Table 6.1-17****MULTI-FRAME MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-------------------------|-------------|-----------|--------------|--------------------------|---------------|
| Number of Frames | (0028,0008) | IS | Original | ANAP | AUTO |
| Frame Increment Pointer | (0028,0009) | AT | Original | ANAP | AUTO |

6.1.1.5.13. Frame Pointers Module**Table 6.1-18****FRAME POINTERS MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-----------------------------|-------------|-----------|--------------|--------------------------|---------------|
| Representative Frame Number | (0028,6010) | US | Original | ANAP | AUTO |

6.1.1.5.14. Mask Module

Table 6.1-19

MASK MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---------------------------|-------------|-----------|--------------|--------------------------|---------------|
| Recommended Viewing Mode | (0028,1090) | CS | Original | ANAP | AUTO |
| Mask Subtraction Sequence | (0028,6100) | SQ | Original | ANAP | AUTO |
| >Mask Operation | (0028,6101) | CS | Original | ANAP | AUTO |
| >Mask Frame Numbers | (0028,6110) | US | Original | ANAP | AUTO |
| >Mask Sub-pixel Shift | (0028,6114) | FL | Original | ANAP | AUTO |

6.1.1.5.15. Display Shutter Module

Table 6.1-20

DISPLAY SHUTTER MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-------------------------------|-------------|-----------|---------------------------|--------------------------|---------------|
| Shutter Shape | (0018,1600) | CS | “RECTANGULAR” | ANAP | AUTO |
| Shutter Left Vertical Edge | (0018,1602) | IS | Left edge of the shutter | ANAP | AUTO |
| Shutter Right Vertical Edge | (0018,1604) | IS | Right edge of the shutter | ANAP | AUTO |
| Shutter Upper Horizontal Edge | (0018,1606) | IS | Upper edge of the shutter | ANAP | AUTO |
| Shutter Lower Horizontal Edge | (0018,1608) | IS | Lower edge of the shutter | ANAP | AUTO |

6.1.1.5.16. CR Image Module

Table 6.1-21

CR IMAGE MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-----------------------------|-------------|-----------|--------------|--------------------------|---------------|
| KVP | (0018,0060) | DS | Original | ALWAYS | AUTO |
| Distance Source to Detector | (0018,1110) | DS | Original | ANAP | AUTO |
| Distance Source to Patient | (0018,1111) | DS | Original | ANAP | AUTO |
| Exposure Time | (0018,1150) | IS | Original | ALWAYS | AUTO |
| X-Ray Tube Current | (0018,1151) | IS | Original | ALWAYS | AUTO |
| Exposure | (0018,1152) | IS | Original | ANAP | AUTO |
| Exposure in uAs | (0018,1153) | IS | Original | ANAP | AUTO |
| Image Pixel Spacing | (0018,1164) | DS | Original | ALWAYS | AUTO |
| Exposure Index | (0018,1411) | DS | Original | ANAP | AUTO |
| Target Exposure Index | (0018,1412) | DS | Original | ANAP | AUTO |
| Deviation Index | (0018,1413) | DS | Original | ANAP | AUTO |
| Photometric Interpretation | (0028,0004) | CS | Original | ALWAYS | AUTO |
| Pixel Spacing | (0028,0030) | DS | Original | ALWAYS | AUTO |

6.1.1.5.17. X-Ray Image Module

Table 6.1-22

X-RAY IMAGE MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------------|-------------|-----------|--------------|--------------------------|---------------|
| Image Type | (0008,0008) | CS | Original | ALWAYS | AUTO |
| Samples per Pixel | (0028,0002) | US | Original | ALWAYS | AUTO |
| Photometric Interpretation | (0028,0004) | CS | Original | ALWAYS | AUTO |
| Bits Allocated | (0028,0100) | US | Original | ALWAYS | AUTO |
| Bits Stored | (0028,0101) | US | Original | ALWAYS | AUTO |
| High Bits | (0028,0102) | US | Original | ALWAYS | AUTO |
| Pixel Representation | (0028,0103) | US | Original | ALWAYS | AUTO |
| Pixel Intensity Relationship | (0028,1040) | CS | Original | ALWAYS | AUTO |
| Lossy Image Compression | (0028,2110) | CS | Original | ALWAYS | AUTO |

6.1.1.5.18. X-Ray Acquisition Module

Table 6.1-23

X-RAY ACQUISITION MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|-------------|-----------|--------------|--------------------------|---------------|
| KVP | (0018,0060) | DS | Original | ALWAYS | AUTO |
| Field of View Shape | (0018,1147) | CS | Original | ALWAYS | AUTO |
| Field of View Dimension(s) | (0018,1149) | IS | Original | ALWAYS | AUTO |
| Exposure Time | (0018,1150) | IS | Original | ALWAYS | AUTO |
| X-Ray Tube Current | (0018,1151) | IS | Original | ALWAYS | AUTO |
| Exposure | (0018,1152) | IS | Original | ANAP | AUTO |
| Exposure in uAs | (0018,1153) | IS | Original | ANAP | AUTO |
| Radiation Setting | (0018,1155) | CS | Original | ANAP | AUTO |
| Radiation Mode | (0018,115A) | CS | Original | ANAP | AUTO |
| Image and Fluoroscopy Area Dose Product | (0018,115E) | DS | Original | ALWAYS | AUTO |
| Image Pixel Spacing | (0018,1164) | DS | Original | ALWAYS | AUTO |
| Exposure Index | (0018,1411) | DS | Original | ANAP | AUTO |
| Target Exposure Index | (0018,1412) | DS | Original | ANAP | AUTO |
| Deviation Index | (0018,1413) | DS | Original | ANAP | AUTO |
| Exposure Time in uS | (0018,8150) | DS | Original | ALWAYS | AUTO |
| X-Ray Tube Current in uA | (0018,8151) | DS | Original | ALWAYS | AUTO |
| Pixel Spacing | (0028,0030) | DS | Original | ALWAYS | AUTO |

6.1.1.5.19. X-Ray Collimator Module

Table 6.1-24

X-RAY COLLIMATOR MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------------------|-------------|-----------|--------------|--------------------------|---------------|
| Collimator Shape | (0018,1700) | CS | Original | ANAP | AUTO |
| Collimator Left Vertical Edge | (0018,1702) | IS | Original | ANAP | AUTO |
| Collimator Right Vertical Edge | (0018,1704) | IS | Original | ANAP | AUTO |
| Collimator Upper Horizontal Edge | (0018,1706) | IS | Original | ANAP | AUTO |
| Collimator Lower Horizontal Edge | (0018,1708) | IS | Original | ANAP | AUTO |

6.1.1.5.20. XRF Positioner Module

Table 6.1-25

XRF POSITIONER MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|-------------|-----------|--------------|--------------------------|---------------|
| Distance Source to Detector | (0018,1110) | DS | Original | ANAP | AUTO |
| Distance Source to Patient | (0018,1111) | DS | Original | ANAP | AUTO |
| Estimated Radiographic Magnification Factor | (0018,1114) | DS | Original | ANAP | AUTO |

6.1.1.5.21. VOI LUT Module

Table 6.1-26

VOI LUT MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-----------------------|-------------|-----------|--|--------------------------|---------------|
| Window Center | (0028,1050) | DS | In case of SC, "127" Other, from current parameters | ALWAYS | AUTO |
| Window Width | (0028,1051) | DS | In case of SC, "255" Other, from current parameters | ALWAYS | AUTO |

6.1.1.5.22. X-Ray Acquisition Dose Module

Table 6.1-27

X-RAY ACQUISITION DOSE MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|-------------|-----------|--------------|--------------------------|---------------|
| KVP | (0018,0060) | DS | Original | ALWAYS | AUTO |
| Distance Source to Detector | (0018,1110) | DS | Original | ALWAYS | AUTO |
| Distance Source to Patient | (0018,1111) | DS | Original | ALWAYS | AUTO |
| Exposure Time | (0018,1150) | IS | Original | ALWAYS | AUTO |
| X-Ray Tube Current | (0018,1151) | IS | Original | ALWAYS | AUTO |
| Exposure | (0018,1152) | IS | Original | ANAP | AUTO |
| Exposure in uAs | (0018,1153) | IS | Original | ANAP | AUTO |
| Image and Fluoroscopy Area Dose Product | (0018,115E) | DS | Original | ALWAYS | AUTO |
| Exposure Time in uS | (0018,8150) | DS | Original | ALWAYS | AUTO |
| X-Ray Tube Current in uA | (0018,8151) | DS | Original | ALWAYS | AUTO |

6.1.1.5.23. XA Positioner Module

Table 6.1-28

XA POSITIONER MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|-------------|-----------|--------------|--------------------------|---------------|
| Distance Source to Detector | (0018,1110) | DS | Original | ANAP | AUTO |
| Distance Source to Patient | (0018,1111) | DS | Original | ANAP | AUTO |
| Estimated Radiographic Magnification Factor | (0018,1114) | DS | Original | ANAP | AUTO |
| Positioner Motion | (0018,1500) | CS | Original | VNAP | AUTO |
| Positioner Primary Angle | (0018,1510) | DS | Original | VNAP | AUTO |
| Positioner Secondary Angle | (0018,1511) | DS | Original | VNAP | AUTO |

6.1.1.5.24. DX Anatomy Imaged Module

Table 6.1-29

DX ANATOMY IMAGED MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--------------------------|-------------|-----------|--------------|--------------------------|---------------|
| Anatomic Region Sequence | (0008,2218) | SQ | Original | EMPTY | AUTO |
| Image Laterality | (0020,0062) | CS | Original | ALWAYS | AUTO |

6.1.1.5.25. DX Image Module

Table 6.1-30

DX IMAGE MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-----------------------------------|-------------|----|----------|-------------------|--------|
| Image Type | (0008,0008) | CS | Original | ALWAYS | AUTO |
| Patient Orientation | (0020,0020) | CS | Original | ALWAYS | AUTO |
| Samples per Pixel | (0028,0002) | US | Original | ALWAYS | AUTO |
| Photometric Interpretation | (0028,0004) | CS | Original | ALWAYS | AUTO |
| Bits Allocated | (0028,0100) | US | Original | ALWAYS | AUTO |
| Bits Stored | (0028,0101) | US | Original | ALWAYS | AUTO |
| High Bits | (0028,0102) | US | Original | ALWAYS | AUTO |
| Pixel Representation | (0028,0103) | US | Original | ALWAYS | AUTO |
| Burned In Annotation | (0028,0301) | CS | Original | ANAP | AUTO |
| Pixel Intensity Relationship | (0028,1040) | CS | Original | ALWAYS | AUTO |
| Pixel Intensity Relationship Sign | (0028,1041) | SS | Original | ALWAYS | AUTO |
| Window Center | (0028,1050) | DS | Original | ALWAYS | AUTO |
| Window Width | (0028,1051) | DS | Original | ALWAYS | AUTO |
| Rescale Intercept | (0028,1052) | DS | Original | ALWAYS | AUTO |
| Rescale Slope | (0028,1053) | DS | Original | ALWAYS | AUTO |
| Rescale Type | (0028,1054) | LO | Original | ALWAYS | AUTO |
| Lossy Image Compression | (0028,2110) | CS | Original | ALWAYS | AUTO |
| Presentation LUT Shape | (2050,0020) | CS | Original | ALWAYS | AUTO |

6.1.1.5.26. DX Detector Module

Table 6.1-31

DX DETECTOR MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------------|-------------|-----------|--------------|--------------------------|---------------|
| Field of View Shape | (0018,1147) | CS | Original | ALWAYS | AUTO |
| Field of View Dimension(s) | (0018,1149) | IS | Original | ALWAYS | AUTO |
| Image Pixel Spacing | (0018,1164) | DS | Original | ALWAYS | AUTO |
| Exposure Index | (0018,1411) | DS | Original | ANAP | AUTO |
| Target Exposure Index | (0018,1412) | DS | Original | ANAP | AUTO |
| Deviation Index | (0018,1413) | DS | Original | ANAP | AUTO |
| Detector Type | (0018,7004) | CS | Original | EMPTY | AUTO |
| Pixel Spacing | (0028,0030) | DS | Original | ALWAYS | AUTO |

6.1.1.5.27. Acquisition Context Module

Table 6.1-32

ACQUISITION CONTEXT MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------------|-------------|-----------|--------------|--------------------------|---------------|
| Acquisition Context Sequence | (0040,0555) | SQ | Original | EMPTY | AUTO |

6.1.1.5.28. SOP Common Module

Table 6.1-33

SOP COMMON MODULE OF CREATED SOP INSTANCES

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------|-------------|----|----------|-------------------|--------|
| Specific Character Set | (0008,0005) | CS | Original | ALWAYS | AUTO |
| Instance Creation Date | (0008,0012) | DA | Original | ALWAYS | AUTO |
| Instance Creation Time | (0008,0013) | TM | Original | ALWAYS | AUTO |
| SOP Class UID | (0008,0016) | UI | Original | ALWAYS | AUTO |
| SOP Instance UID | (0008,0018) | UI | Original | ALWAYS | AUTO |

6.1.2. Used Fields in received IOD by application

The Side Station i3 storage application does not receive SOP Instances.

6.1.3. Attribute mapping

The Side Station is doesn't have any attribute mapping function.

6.1.4. Coerced/Modified Fields

The Side Station i3 does not coerce/modify any attribute values received in the response to a Modality Worklist Query.

6.2. DATA DICTIONARY OF PRIVATE ATTRIBUTES

The Private Attributes added to create SOP Instances are listed in the Table below. The Side Station i3 reserves block of private attributes in groups 6B07.

These Private Attributes will be added to all the Image Instances created by the Side Station i3.

Table 6.2-1

DATA DICTIONARY OF PRIVATE ATTRIBUTES

| Tag | Attribute Name | VR | VM | Attribute Description |
|-------------|-----------------------|-----------|-----------|---|
| (6B07,0030) | Private Creator | LO | 1 | SHPF0730.0 |
| (6B07,3000) | Last Modifier | UI | 1 | UID of the system who modified this image last. |
| (6B07,3001) | Last Modify Date | DA | 1 | Data at which this image was last modified. |
| (6B07,3002) | Last Modify Time | TM | 1 | Time at which this image was last modified. |

6.3. Coded Terminology and Templates

No Coded Terminology and Templates are supported.

6.4. Grayscale Image Consistency

The high resolution display monitor attached to the Side Station i3 should be adjusted by the Service Personnel during the installation.

6.5. Standard Extended/Specialized/Private SOP Classes

No Specialized or Private SOP Classes are supported.

6.6. Private Transfer Syntaxes

No Private Transfer Syntaxes are supported.