Technical Publications

Direction DOC2824921
Revision 3

OEC One ASD Workstation
DICOM CONFORMANCE STATEMENT

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REVISION HISTORY

REV	VER	DATE	REASON FOR CHANGE
1	1	Feb 16 2023	Initial version
2	1	Nov 14 2023	Update Attribute Name "Laterality" and "Patient Position" in section 4.4.3.1 Update Attribute Name “Bits Stored” Value in section 4.4.5.2 and 4.4.5.7
3	1	Dec 27 2023	Modify description typo.

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CONFORMANCE STATEMENT OVERVIEW

This DICOM Conformance Statement captures the DICOM capabilities of the OEC One ASD Workstation identified below.

Table 0.1 provides an overview of the network services supported by OEC One ASD Workstation system.

Table 0.1 – NETWORK SERVICES

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Computed Radiography Image Storage	No	Yes
Secondary Capture Image Storage	No	Yes
X-Ray Angiographic Image Storage	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	No	Yes
X-Ray Radiation Dose SR	Yes	No
Query/Retrieve		
Patient Root Query/Retrieve Information Model – FIND	Yes	No
Patient Root Query/Retrieve Information Model – MOVE	Yes	No
Study Root Query/Retrieve Information Model – FIND	Yes	No
Study Root Query/Retrieve Information Model – MOVE	Yes	No
Print Management		
Basic Film Session SOP Class	Yes	No
Basic Film Box SOP Class	Yes	No
Basic Grayscale Image Box SOP Class	Yes	No
Basic Grayscale Print Management Meta SOP Class	Yes	No
Printer SOP Class	Yes	No
Workflow Management		
Storage Commitment Push Model SOP Class	Yes	No
Modality Performed Procedure Step SOP Class	Yes	No
Modality Worklist Information Model – FIND SOP Class	Yes	No

Table 0.2 provides an overview of the Media Storage Application Profiles supported by Workstation system.

Table 0.2 - MEDIA SERVICES

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
USB		
X-Ray Angiographic Image Storage	Yes	Yes
X-Ray Radiation Dose SR	Yes	No

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1. INTRODUCTION

1.1 OVERVIEW

This DICOM Conformance Statement is divided into Sections as described below:

Section 1 (Introduction), which describes the overall structure, intent, and references for this Conformance Statement

Section 2 (Network Conformance Statement), which specifies the GEHC equipment compliance to the DICOM requirements for the implementation of Networking features.

Section 3 (Media Storage Conformance Statement), specifies the Workstation equipment compliance to the DICOM requirements for the implementation of Media Storage features.

Section 4 (X-Ray Angiographic Information Object Implementations), specifies the Workstation Medical Systems equipment compliance to DICOM requirements for the implementation of an X-Ray Information Objects.

Section 5 (X-Ray Radiation Dose SR Information Object Implementations), specifies the Workstation Medical Systems equipment compliance to DICOM requirements for the implementation of X-Ray Radiation Dose SR Information Object Implementation feature.

Section 6 (Modality Worklist Query Information Model), specifies the Workstation Medical Systems equipment compliance to DICOM requirements for the implementation of the Modality Worklist service.

Section 7 (Modality Performed Procedure Step Implementation), specifies the Workstation Medical Systems equipment compliance to DICOM requirements for the implementation of the Modality Performed Procedure Step SOP Classes.

Section 8 (Storage Commitment Push Model Implementation), specifies the Workstation Medical Systems equipment compliance to DICOM requirements for the implementation of the Storage Commitment Push feature.

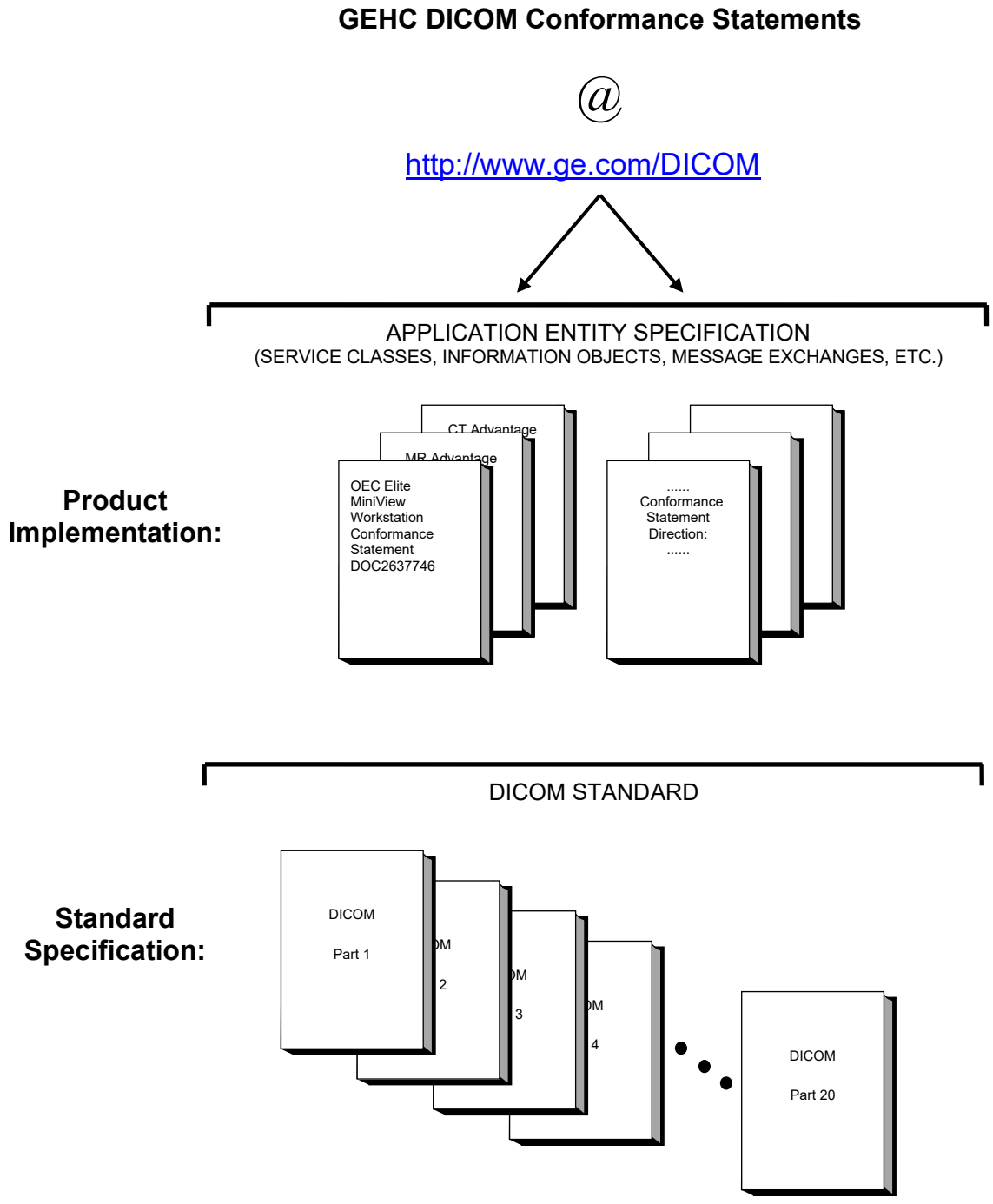
Section 9 (Basic Directory Information Object Implementation), specifies the Workstation Medical Systems equipment compliance to DICOM requirements for the implementation of a Basic Directory Information Object.

Section 10 (Print Management Implementation), specifies the Workstation Medical Systems equipment compliance to DICOM requirements for the implementation of the Basic Print Meta SOP Classes (Grayscale).

Section 11 (Query/Retrieve Information Model), specifies the Workstation Medical Systems equipment compliance to DICOM requirements for the implementation of the Patient, Study Root Query/Retrieve service.

1.2 OVERALL DICOM CONFORMANCE STATEMENT DOCUMENT STRUCTURE

The Documentation Structure of the GEHC DICOM Conformance Statements is shown in the Illustration below.



This document specifies the DICOM implementation. It is entitled:

OEC One ASD Workstation
Conformance Statement for DICOM
Document# ***DOC2824921***

This DICOM Conformance Statement documents the DICOM Conformance Statement and Technical Specification required interoperating with the GEHC network interface.

The GEHC Conformance Statement, contained in this document, also specifies the Lower Layer communications which it supports (e.g., TCP/IP). However, the Technical Specifications are defined in the DICOM Part 8 standard.

For more information regarding DICOM, copies of the Standard may be obtained on the Internet at http://medical.nema.org. Comments on the Standard may be addressed to:

DICOM Secretariat
NEMA
1300 N. 17th Street, Suite 1752
Rosslyn, VA 22209
USA
Phone: +1.703.841.3200

1.3 INTENDED AUDIENCE

The reader of this document is concerned with software design and/or system integration issues. It is assumed that the reader of this document is familiar with the DICOM Standard and with the terminology and concepts which are used in that Standard.

1.4 SCOPE AND FIELD OF APPLICATION

It is the intent of this document to provide an unambiguous specification for GEHC implementations. This specification, called a Conformance Statement, includes a DICOM Conformance Statement and is necessary to ensure proper processing and interpretation of GEHC medical data exchanged using DICOM. The GEHC Conformance Statements are available to the public.

The reader of this DICOM Conformance Statement should be aware that different GEHC devices are capable of using different Information Object Definitions. For example, a GEHC CT Scanner may send images using the CT Information Object, MR Information Object, Secondary Capture Object, etc.

Included in this DICOM Conformance Statement are the Module Definitions which define all data elements used by this GEHC implementation. If the user encounters unspecified private data elements while parsing a GEHC Data Set, the user is well advised to ignore those data elements (per the DICOM standard). Unspecified private data element information is subject to change without notice. If, however, the device is acting as a "full fidelity storage device", it should retain and re-transmit all of the private data elements which are sent by GEHC devices.

1.5 IMPORTANT REMARKS

The use of these DICOM Conformance Statements, in conjunction with the DICOM Standards, is intended to facilitate communication with GE imaging equipment. However, **by itself, it is not sufficient to ensure that inter-operation will be successful**. The **user (or user's agent)** needs to proceed with caution and address at least four issues:

- **Integration** - The integration of any device into an overall system of interconnected devices goes beyond the scope of standards (DICOM v3.0), and of this introduction and associated DICOM Conformance Statements when interoperability with non-GE equipment is desired. The responsibility to analyze the applications requirements and to design a solution that integrates GE imaging equipment with non–GE systems is the **user's** responsibility and should not be underestimated. The **user** is strongly advised to ensure that such an integration analysis is correctly performed.

- **Validation** - Testing the complete range of possible interactions between any GE device and non–GE devices, before the connection is declared operational, should not be overlooked. Therefore, the **user** should ensure that any non–GE provider accepts full responsibility for all validation required for their connection with GE devices. This includes the accuracy of the image data once it has crossed the interface between the GE imaging equipment and the non–GE device and the stability of the image data for the intended applications.

  Such a validation is required before any clinical use (diagnosis and/or treatment) is performed. It applies when images acquired on GE imaging equipment are processed/displayed on a non-GE device, as well as when images acquired on non-GE equipment is processed/displayed on a GE console or workstation.

- **Future Evolution** - GE understands that the DICOM Standard will evolve to meet the user's growing requirements. GE is actively involved in the development of the DICOM Standard. DICOM will incorporate new features and technologies and GE may follow the evolution of the Standard. The GEHC protocol is based on DICOM as specified in each DICOM Conformance Statement. Evolution of the Standard may require changes to devices which have implemented DICOM. **In addition, GE reserves the right to discontinue or make changes to the support of communications features (on its products) described by these DICOM Conformance Statements**. The **user** should ensure that any non–GE provider, which connects with GE devices, also plans for the future evolution of the DICOM Standard. Failure to do so will likely result in the loss of function and/or connectivity as the DICOM Standard changes and GE Products are enhanced to support these changes.

- **Interaction** - It is the sole responsibility of the **non–GE provider** to ensure that communication with the interfaced equipment does not cause degradation of GE imaging equipment performance and/or function.

1.6 REFERENCES

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

1.7 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.

Joint Photographic Experts Group (JPEG) – a set of standardized image compression techniques, available for use by DICOM applications.

Media Application Profile – the specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs)

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.

Security Profile – a set of mechanisms, such as encryption, user authentication, or digital signatures, used by an *Application Entity* to ensure confidentiality, integrity, and/or availability of exchanged DICOM data

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.

1.8 SYMBOLS AND ABBREVIATIONS

AE	Application Entity

AET	Application Entity Title
CAD	Computer Aided Detection
CD-R	Compact Disk Recordable
CR	Computed Radiography
CT	Computed Tomography
DB	Database
DHCP	Dynamic Host Configuration Protocol
DICOM	Digital Imaging and Communications in Medicine
DX	Digital X-ray
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
HL7	Health Level 7 Standard
HLF	High Level Fluoro
IOD	Information Object Definition
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISO	International Organization for Standards
JPEG	Joint Photographic Experts Group
LUT	Look-up Table
MPPS	Modality Performed Procedure Step
MR	Magnetic Resonance Imaging
MWL	Modality Worklist
O	Optional (Key Attribute)
PACS	Picture Archiving and Communication System
PDU	Protocol Data Unit
R	Required (Key Attribute)
RDSR	Radiation Dose Structured Reports

RF	Radiofluoroscopy
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
SPS	Scheduled Procedure Step
SR	Structured Reporting
TCP/IP	Transmission Control Protocol/Internet Protocol
U	Unique (Key Attribute)
VR	Value Representation
XA	X-ray Angiography

2. NETWORK CONFORMANCE STATEMENT

2.1 INTRODUCTION

This section of the DICOM Conformance Statement specifies the Workstation compliance to DICOM requirements for **Networking** features.

The Workstation runs on industrial computer. It provides the following DICOM functionalities:

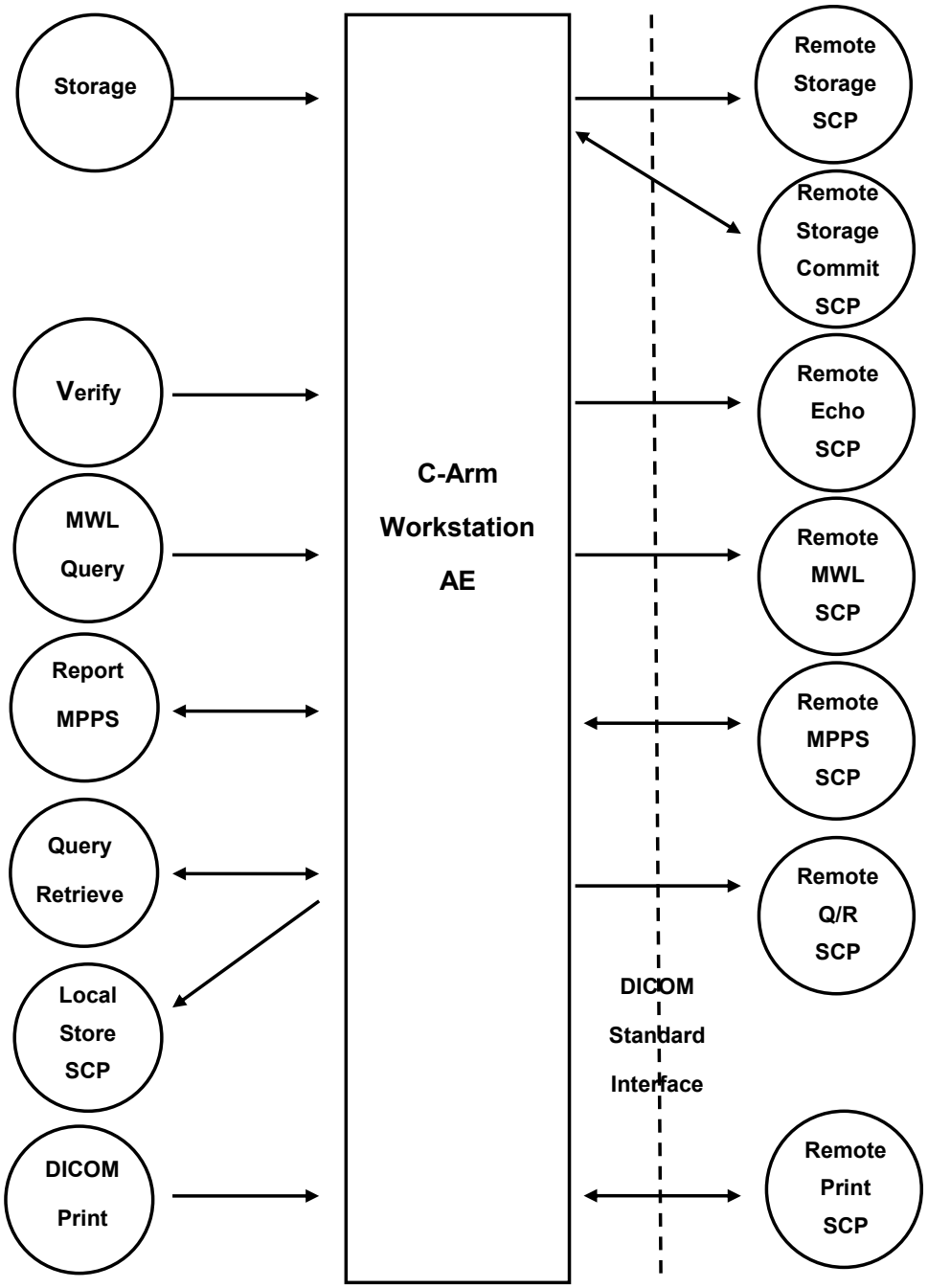
- Send Echo message to DICOM Verification SCP.
- Export DICOM images and RDSR to a DICOM Storage SCP.
- Query DICOM Modality Worklist from a DICOM Worklist SCP.
- Querying for saved examinations and retrieving saved examinations from a DICOM Query/Retrieve SCP
- Sending exam start and end messages to a DICOM Modality Performed Procedure Step SCP.
- Sending storage commitment requests to a DICOM Storage Commitment SCP.
- Print acquired images to a DICOM Printer.

2.2 IMPLEMENTATION MODEL

2.2.1 Application Data Flow Diagram

The network application model for the Workstation is shown in the following Illustration :

ILLUSTRATION 2–1
WORKSTATION NETWORK APPLICATION MODEL AND DATA FLOW DIAGRAM



The Workstation supports activity "Storage" which performs images/RDSR storage and storage commitment functions; The results of that functionalities are communicated to Remote Store Server for DICOM image/RDSR storage and storage commitment.

The Workstation supports activity "Print" which performs images print functions; The results of that functionalities are communicated to Remote Printer/Server for DICOM image print functions.

The Workstation supports activity "Verify" which interacts with Remote Verify SCP for DICOM Echo purpose.

The Workstation supports activity "Modality Worklist Query" which performs Modality worklist query, from remote Modality Worklist SCP.

The Workstation supports activity "Query": Initiate an association with a Remote AE to query for images on the remote host. Once the association has been established, it sends a sequence of requests (Patient, then Study then Series Level requests) to the Remote AE. After all responses are received, Workstation AE will issue a Series-Level C-FIND-RQ request to get the series for a study in the list.

The Workstation supports activity "Retrieve": Send a C-MOVE-RQ request to a Remote AE after successful association establishment. The Workstation AE's Storage SCP will receive the images over a separate association.

The Workstation supports activity "Report MPPS": When the user begins the image acquisition process and generates the first image, the Workstation AE sends N-CREATE message to the configured MPPS SCP to indicate that the image acquisition process has been started for the requested procedure. The operator can close the acquisition session either by completing the acquisition process or discontinuing the ongoing scan. On closing the acquisition session, the Workstation AE sends N-SET message to the configured MPPS SCP to indicate the acquisition state of the requested procedure, with appropriate MPPS status (COMPLETED/DISCONTINUED).

2.2.2 Functional Definition of AE's

Application Entity "OEC One ASD Workstation AE" initiates the following functionalities :

- DICOM Host Verification: Initiate an association and send a C-ECHO-RQ message to the remote DICOM AE; the remote DICOM server will send back a C-ECHO-RSP message with a status of "success" if the operation is successful.

- DICOM Image Storage: Initiate an association to a remote AE to send image(s). If the remote AE accept the presentation context applicable to the image(s), the WorkstationAE will send the image(s) by invoking C-STORE-RQ operation for each image on the same association. The remote DICOM server will send back C-STORE-RSP with status "success" if the operation is successful.

- Storage Commitment: Initiates a DICOM Storage Commitment request once a Store request has completed successfully. An N-ACTION request specifying all the successfully transferred images will be issued to the remote AE. The remote AE will reply accepting or refusing the request on the same association. If accepted the remote AE will issue an N-EVENT response specifying which images have been committed and which, if any, have not.

- Modality Worklist Query: Initiate an association with a remote AE to query for scheduled exams, a C-FIND-RQ request will be sent to the remote AE. C-FIND-RSP with query results will be received.

- Query: Initiate an association with a Remote AE to query for images on the remote host. Follows the Patient->Study->Series sequence C-FIND-RQ request (the request more than once) will be sent to the Remote AE once an association has been established. Once all the responses have been received, the operator needs to select an exam in the local database browser; on selection of the exam the DICOM Server AE will issue a Series-Level C-FIND-RQ request to get the series for a study in the list. Similarly the Image-Level C-FIND-RQ will be issued for the series selected from the series list.

- Retrieve: Send a C-MOVE-RQ request to a Remote AE for retrieve of images after successful establishment. At this time the Local Store SCP listener will start, not until after receiving complete images the Local Store SCP listener will stopped.

- DICOM Print: Initiate an association with a remote AE to print grayscale images, please refer to Section 2.3.1.2.6.2.1 for details

2.2.3 Sequencing of Real-World Activities

This sequence is only applicable for Remote AE where Storage Commitment Option is allowed in Network Manager.

1. The user selects the images and sends them to a remote host.

2. If the remote DICOM AE is associated with a Storage Commitment Provider AE and if the images are successfully sent to the DICOM AE, then an N-ACTION-RQ request is sent automatically to the associated Storage Commitment Provider AE. The Storage Commitment Provider AE can be configured independently from the remote DICOM AE with network address, port and AE title.

2.3 AE SPECIFICATIONS

2.3.1 Workstation AE Specification

The Workstation Application Entity provides Standard Conformance to the following DICOM SOP Classes as an **SCU** and/or as an **SCP**:

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	No	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	No	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	No	Yes
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Yes	No
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Yes	No
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Yes	No
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	No
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Yes	No
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Yes	No
Storage Commitment Push Model	1.2.840.10008.1.20.1	Yes	No
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No

2.3.1.1 Association Establishment Policies

2.3.1.1.1 General

The DICOM Application Context Name (ACN), which is always proposed, is:

Application Context Name	1.2.840.10008.3.1.1.1

The maximum length PDU receive size for the Workstation AE is:

Maximum Length PDU	16384

2.3.1.1.2 Number of Associations

The Workstation AE will initiate a maximum of 1 simultaneous association to remote nodes.

The Workstation AE will support a maximum of 1 simultaneous associations initiated by remote nodes.

2.3.1.1.3 Asynchronous Nature

Asynchronous mode is not supported. All operations will be performed synchronously.

2.3.1.1.4 Implementation Identifying Information

The Implementation UID for this DICOM Implementation is:

OEC One ASD Implementation UID	1.2.840.113619.6.320
OEC One ASD Implementation Version Name	GEHC_OEC_300

2.3.1.2 Association Initiation Policy

When the Workstation Application Entity initiates an Association for any Real-World Activity, it will propose the Presentation Contexts for all Real-World Activities; i.e., there is only a single, comprehensive Presentation Context Negotiation proposed for the AE.

The Workstation AE proposes only a single Transfer Syntax in each Presentation Context; i.e., for each Abstract Syntax in the following Presentation Context Tables, the AE proposes one Presentation Context for each specified Transfer Syntax.

2.3.1.2.1 Real-World Activity Verify

2.3.1.2.1.1 Associated Real-World Activity

The user may initiate a DICOM Verify Request in the configuration screen for each respective remote SCP configuration (Print, Store/Store Commit, Worklist Query, MPPS, SC and Q/R).

A valid response from the SCP will result in a "The DICOM server has verified successfully" screen displayed on the screen. In the event that the SCP does not response for some reason, the operation will timeout and the Workstation AE will close the association and results in "The DICOM Verify Fails" screen displayed to user.

Note: The default timeout is 30 seconds for DICOM Echo and this value could be configured from system setup screen.

2.3.1.2.1.2 Proposed Presentation Context Table

Presentation Context Table – Proposed by Workstation AE for Activity Verify					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

2.3.1.2.1.2.1 SOP Specific DICOM Conformance Statement for Verify SOP Classes

The message "The DICOM server has verified successfully" is displayed when the DICOM Verify is successfully performed, otherwise message "The DICOM Verify Fails" is displayed.

2.3.1.2.2 Real-World Activity Schedule Update

2.3.1.2.2.1 Associated Real-World Activity

Upon a request by the operator, the current scheduled exam list should be updated from the remote Modality Worklist Server.

2.3.1.2.2.2 Proposed Presentation Context Table

Presentation Context Table – Proposed by Workstation AE for Activity Modality Worklist				
Abstract Syntax		**Transfer Syntax**		**Role**
Name	**UID**	**Name List**	**UID List**	
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU

2.3.1.2.2.2.1 SOP Specific DICOM Conformance Statement for the Modality Worklist Information Model - FIND SOP Class

The Workstation AE includes matching keys in the Modality Worklist queries as described in Section 6.

The results of the Worklist query are displayed to the user in the Scheduled Exam Screen. Currently, the maximal capability of received scheduled exams is 500 and not configurable.

The Workstation AE checks the Specific Character Set tag (0008,0005) contained in a C-FIND RSP, ISO_IR 100 or blank will be accepted, and all other value will be discarded. Responses without this tag will also be accepted.

A C-FIND CANCEL will be sent when the maximal capability of received scheduled exams(500 exams) is reached or user cancels operation by clicking the Cancel button on the progressing screen.

Following are the status codes that are more specifically processed when receiving messages from a **Modality Worklist** SCP equipment:

Service Status	Status Code	Further Meaning	Application Behavior When Receiving Status Code
Failure	A700	Refused: Out of resources	Terminates the association and operation. Logs failure message along with error comment returned from SCP and displays failure message.
	A900	Error: Identifier does not match SOP Class	
	C000-CFFF	Error: Unable to process	
	0122	SOP Class Not Supported	
Cancel	FE00	Matching terminated due to cancel	The progress screen is disappeared, the received scheduled exams will be displayed.
Success	0000	Matching is complete - No final identifier is supplied	The progress screen is disappeared, all the received scheduled exams will be displayed.
Pending	FF00	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	The progress screen is still displayed.
	FF01	Matches are continuing - Warning that one or more Optional Keys were not supported for existence for this Identifier	The progress screen is still displayed.
*	*	Any other status code.	Deemed a failure.

2.3.1.2.3 Real-World Activity Start/End Exam

2.3.1.2.3.1 Associated Real-World Activity

The system will start collecting X-ray dose information for the selected exam as soon as the X-ray activation switch is pressed. This starts the exam.

The user is provided a control to end/abandon an exam on the Image and Saved Exams screens. This will create the RDSR and optionally send the RDSR to an RDSR SCP.

2.3.1.2.3.2 Proposed Presentation Context Table

See Section 2.3.1.2.4 "Image RDSR Send and Storage Commit" for RDSR conformance.

2.3.1.2.4 Real-World Activity Image/RDSR Send and Storage Commit

2.3.1.2.4.1 Associated Real-World Activity

The user is able to store Images and RDSRs from the Images screen. Images can be stored at any time during or after the exam. RDSRs are only available after an exam is ended with a End Exam or Complete Exam.

2.3.1.2.4.2 Proposed Presentation Context Table

Presentation Context Table – Proposed by Workstation AE for Activity Storage				
Abstract Syntax		**Transfer Syntax**		**Role**
Name	**UID**	**Name List**	**UID List**	
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU

2.3.1.2.4.2.1 SOP Specific DICOM Conformance Statement for All Storage SOP Classes

The Workstation AE includes optional data elements in the SOP Instances as described in Section 4.

Following are the status codes that are more specifically processed when receiving messages from a **Storage** SCP equipment : If store command completed normally, with a status of success or some warning then the image was accepted.

Service Status	Status Code	Further Meaning	Application Behavior When Receiving Status Code
Failure	A700-A7FF	Refused: Out of resources	Terminate the operation. Logs store failed message along with error comment returned from SCP. Displays store failure message.
	A900-A9FF	Error: Data Set does not match SOP Class	
	C000-CFFF	Error: Cannot Understand	
	0122	SOP Class Not Supported	
Warning	B000	Coercion of Data Elements	Ignored by application and current operation continues
	B006	Elements Discarded	
	B007	Data Set does not match SOP Class	

Success	0000	DICOM storage operation is success	The DICOM operation progress screen disappearance indicates current operation is success.
*	*	Any other status code.	Upon receiving a C-STORE confirmation containing a Refused status, this implementation will terminate the association.

2.3.1.2.4.2.2 SOP Specific DICOM Conformance Statement for the X-Ray Radiation Dose Storage SOP Classes

See Section 2.3.1.2.4.2.1 "SOP Specific DICOM Conformance Statement for All Storage SOP Classes" for details on general Storage Service SCU processing also applicable to the X-Ray Radiation Dose Storage SOP Classes.

The Workstation AE supports creation and transmission of X-Ray Radiation Dose SOP Instances referencing Instances of the following Storage SOP Classes:

SOP Class Name	SOP Class UID
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1

2.3.1.2.4.2.3 SOP Specific DICOM Conformance Statement for the Storage Commitment Push Model SOP Class SCU

The Workstation AE uses DICOM network storage services to transfer SOP Instances which are to be committed.

The Workstation AE may request Storage Commitment for Instances of any of the Composite SOP Classes it supports as an SCU (see Section 2.3.1.2.4.2.1).

The Storage Commitment Information Object is described in Section 8.

Upon receiving a Storage Commitment N-EVENT-REPORT (Storage Commitment Result on the same association), the Workstation AE will return a Success status.

Note: N-EVENT-REPORT is only expected on the same association.

Following are the status codes that are more specifically processed when receiving N-Action responses from Storage Commitment SCP equipment:

Service Status	Status Code	Further Meaning	Application Behavior When Receiving Status Code
Failure	0119	Class-instance conflict	Terminates the association and operation. Logs failure message along with error comment returned from SCP and displays failure message.
	0210	Duplicate invocation	
	0115	Invalid argument value	
	0117	Invalid SOP Instance	
	0212	Mistyped argument	
	0123	No such action	

	0114	No such argument	
	0118	No such SOP Class	
	0112	No such SOP Instance	
	0110	Processing failure	
	0213	Resource limitation	
	0211	Unrecognized operation	
Success	0000		The progress screen is disappeared.
*	*	Any other status code.	Deemed a failure.

2.3.1.2.5 Real-World Activity Image Query/Retrieve and Local Store SCP

2.3.1.2.5.1 Associated Real-World Activity

Upon a request from the user, a C-FIND-RQ command will be issued to the Query/Retrieve SCP to query for exams that match the user-defined query criteria. The association will be released upon the receipt of the C-FIND-RSP confirmation. To retrieve an exam, the user can either use the information returned from a query or the information stored in the local database when the exam was archived. The C-MOVE-RQ command is used to retrieve the exam from the Query/Retrieve SCP. The C-STORE-RQ from the SCP is expected on another association.

After a DICOM file is retrieved, the attributes are extracted and saved onto the local system.

2.3.1.2.5.2 Proposed Presentation Context Table

Presentation Context Table – Proposed by Workstation AE for Activity Modality Worklist				
Abstract Syntax		**Transfer Syntax**		**Role**
Name	**UID**	**Name List**	**UID List**	
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU

2.3.1.2.5.2.1 SOP Specific DICOM Conformance Statement for the Patient Root Query/Retrieve Information Model - FIND, Study Root Query/Retrieve Information Model - FIND SOP Classes

The Workstation AE includes matching keys in the queries as described in Section 11.

The Acquisition AE evaluates a C-FIND RSP containing the Specific Character Set tag (0008,0005). Values of ISO_IR 100 or blank will be accepted, and all others will be rejected.

Responses without this tag will also be accepted.

A C-FIND CANCEL will be sent when the display limit for results is reached.

The Workstation does not support Extended Negotiation for C-FIND.

Following are the status codes that are more specifically processed when receiving messages from a Query SCP equipment:

Service Status	Status Code	Further Meaning	Application Behavior When Receiving Status Code
Failure	A700	Refused: Out of resources	Terminates the association and operation. Logs failure message along with error comment returned from SCP and displays failure message.
	A900	Error: Identifier does not match SOP Class	
	C000-CFFF	Error: Unable to process	
	0122	SOP Class Not Supported	
Cancel	FE00	Matching terminated due to cancel	The progress screen is disappeared, the received scheduled exams will be displayed
Success	0000	Matching is complete - No final identifier is supplied	The progress screen is disappeared, all the received scheduled exams will be displayed.
Pending	FF00	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	The progress screen is still displayed.
	FF01	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or matching for this Identifier	The progress screen is still displayed.
*	*	Any other status code.	Deemed a failure.

2.3.1.2.5.2.2 SOP Specific DICOM Conformance Statement for the Patient Root Query/Retrieve Information Model - MOVE , Study Root Query/Retrieve Information Model - MOVE SOP Classes

The C-MOVE-RQ will use the AE Title of the Workstation Application Entity as the Move Destination AE Title.

A C-FIND CANCEL message is sent if the user clicks the Cancel button during the move.

Following are the status codes that are more specifically processed when receiving messages from a **Retrieve** SCP equipment:

Service Status	Status Code	Further Meaning	Application Behavior When Receiving Status Code
Failure	A701	Refused: Out of resources - Unable to calculate number of matches	Terminates the association and operation. Logs failure message along with error comment returned from SCP and displays failure message.
	A702	Refused: Out of resources - Unable to perform sub-operations	
	A801	Refused: Move Destination Unknown	
	A900	Error: Identifier does not match SOP Class	
	C000-CFFF	Error: Unable to process	
	0122	SOP Class Not Supported	
Cancel	FE00	Sub-operations terminated due to a Cancel indication	The progress screen is disappeared, the received scheduled exams will be displayed
Warning	B000	Sub-operations Complete - One or more Failures.	Ignored by application and current operation continues.
Success	0000	Sub-operations Complete - No Failure.	The progress screen is disappeared, all the received scheduled exams will be displayed.
Pending	FF00	Sub-operations are continuing -	The progress screen is still displayed.
*	*	Any other status code.	Deemed a failure.

2.3.1.2.6 Real-World Activity "DICOM Print"

2.3.1.2.6.1 Associated Real-World Activity

Upon a request by the operator the selected images will be sent to the configured DICOM Printer (DICOM Print SCP).

2.3.1.2.6.2 Proposed Presentation Context Table

Presentation Context Table – Proposed by AE Workstation for Activity DICOM Print					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		

Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Printer SOP Class	1.2.840.10008.5.1.1.16	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

2.3.1.2.6.2.1 SOP Specific DICOM Conformance Statement for Basic Grayscale Print Management SOP Classes

The Workstation AE uses the following DIMSE services of the supported SOP Classes:

SOP Class	SOP Class UID	DIMSE Service Element	SCU Usage
Basic Film Session	1.2.840.10008.5.1.1.1	N-CREATE	Used (Mandatory)
		N-SET	Not Used
		N-DELETE	Used
		N-ACTION	Not Used
Basic Film Box	1.2.840.10008.5.1.1.2	N-CREATE	Used (Mandatory)
		N-ACTION	Used (Mandatory)
		N-DELETE	Used
		N-SET	Not Used
Printer	1.2.840.10008.5.1.1.16	N-EVENT-REPORT	Used (Mandatory)
		N-GET	Used
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	N-SET	Used (Mandatory)

When a manual print operation is initiated, the AE:

1. Initiates a DICOM association and negotiates Presentation Contexts

2. N-GETs printer status using the Printer SOP Class

3. N-CREATEs a Basic Film Session SOP Instance, and then followed by N-DELETE of the Basic Film Session SOP Instance.

4. N-CREATEs a Basic Film Box SOP Instance for each film

5. N-SETs the Image Box SOP Instance for each image on the film

6. Prints by N-ACTION on the Basic Film Box SOP Instances, then followed by N-DELETE of the Basic Film Box SOP Instance

7. Receives N-EVENT-REPORTs of the well know Printer SOP Instance indicating printer status if the SCP send a request.

8. Releases the DICOM association after printing is successful or failure has been signaled to the user

9. The DICOM operation progress screen disappearance indicates current operation is success.

The Print management IODs is defined in Section 10.

2.3.1.2.6.2.1.1 Basic Film Session SOP Class

Following are the status codes that are more specifically processed when receiving messages from a **Print** SCP equipment for the Basic Film Session SOP Class N-CREATE:

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes
Failure	0119	Class-instance conflict	Terminate the operation. Logs store failed message along with error comment returned from SCP. Displays print failure message.
	0210	Duplicate invocation	
	0111	Duplicate SOP Instance	
	0106	Invalid attribute value	
	0117	Invalid SOP instance	
	0120	Missing attribute	
	0121	Missing attribute value	
	0212	Mistyped argument	
	0105	No such attributes	
	0118	No such SOP Class	
	0112	No such SOP Instance	
	0110	Processing failure	
	0213	Resource limitation	
	0211	Unrecognized operation	
Warning	B600	Memory allocation not supported	Ignored by application and current operation continues
Success	0000	Film session successfully created	The progress screen is still displayed.
*	*	Any other status code.	Deemed a failure.

Following are the status codes that are more specifically processed when receiving messages from a **Print** SCP equipment for the Basic Film Session SOP Class N-DELETE:

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes
Failure	0119	Class-instance conflict	Terminate the operation. Logs store failed message along with error comment returned from SCP. Displays print failure message.
	0210	Duplicate invocation	
	0117	Invalid SOP instance	
	0212	Mistyped argument	
	0118	No such SOP Class	
	0112	No such SOP Instance	
	0110	Processing failure	
	0213	Resource limitation	
	0211	Unrecognized operation	
Success	0000	Film session successfully deleted	The progress screen is still displayed.
*	*	Any other status code.	Deemed a failure.

2.3.1.2.6.2.1.2 Basic Film Box SOP Class

Following are the status codes that are more specifically processed when receiving messages from a **Print** SCP equipment for the Basic Film Box SOP Class N-CREATE:

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes
Failure	C616	There is an existing Film Box that has not been printed and N-ACTION at the Film Session level is not supported. A new Film Box will not be created when a previous Film Box has not been printed.	Terminate the operation. Logs store failed message along with error comment returned from SCP. Displays print failure message.
	0119	Class-instance conflict	
	0210	Duplicate invocation	
	0111	Duplicate SOP Instance	
	0106	Invalid attribute value	

	0117	Invalid SOP instance	
	0120	Missing attribute	
	0121	Missing attribute value	
	0212	Mistyped argument	
	0105	No such attributes	
	0118	No such SOP Class	
	0112	No such SOP Instance	
	0110	Processing failure	
	0213	Resource limitation	
	0211	Unrecognized operation	
Warning	B605	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	Ignored by application and current operation continues.
Success	0000	Film box successfully created	The progress screen is still displayed.
*	*	Any other status code.	Deemed a failure.

Following are the status codes that are more specifically processed when receiving messages from a **Print** SCP equipment for the Basic Film Box SOP Class N-ACTION:

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes
Failure	C602	Unable to create Print Job SOP Instance; print queue is full	Terminate the operation. Logs store failed message along with error comment returned from SCP. Displays print failure message.
	C603	Image size is larger than image box size (by using the specified magnification value)	
	C604	Image position collision : multiple images assigned to single image position	
	C613	Combined Print Image size is larger than the Image Box size	
	0119	Class-instance conflict	
	0210	Duplicate invocation	
	0115	Invalid argument value	
	0117	Invalid SOP Instance	
	0212	Mistyped argument	
	0123	No such action	

	0114	No such argument	
	0118	No such SOP Class	
	0112	No such SOP Instance	
	0110	Processing failure	
	0213	Resource limitation	
	0211	Unrecognized operation	
Warning	B603	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page)	Ignored by application and current operation continues.
	B604	Image size is larger than image box size, the image has been demagnified.	
	B609	Image size is larger than the Image Box size. The Image has been cropped to fit.	
	B60A	Image size or Combined Print Image size is larger than the Image Box size. Image or Combined Print Image has been decimated to fit.	
Success	0000	Film accepted for printing; if supported, the Print Job SOP Instance is created	The progress screen is still displayed.
*	*	Any other status code.	Deemed a failure.

Following are the status codes that are more specifically processed when receiving messages from a **Print** SCP equipment for the Basic Film Box SOP Class N-DELETE:

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes
Failure	0119	Class-instance conflict	Terminate the operation. Logs store failed message along with error comment returned from SCP. Displays print failure message.
	0210	Duplicate invocation	
	0117	Invalid SOP instance	
	0212	Mistyped argument	
	0118	No such SOP Class	
	0112	No such SOP Instance	
	0110	Processing failure	
	0213	Resource limitation	
	0211	Unrecognized operation	
Success	0000	Film box successfully deleted	The progress screen is still displayed.
*	*	Any other status code.	Deemed a failure.

2.3.1.2.6.2.1.3 Basic Grayscale Image Box SOP Class

Following are the status codes that are more specifically processed when receiving messages from a **Print** SCP equipment for the Basic Grayscale Image Box SOP Class N-SET:

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes
Failure	C603	Image size is larger than image box size	Terminate the operation. Logs store failed message along with error comment returned from SCP. Displays print failure message.
	C605	Insufficient memory in printer to store the image	
	C613	Combined Print Image size is larger than the Image Box size	
	0119	Class-instance conflict	
	0210	Duplicate invocation	
	0106	Invalid attribute value	
	0212	Mistyped argument	
	0117	Invalid SOP instance	
	0121	Missing attribute value	
	0105	No such attributes	
	0118	No such SOP Class	
	0112	No such SOP Instance	
	0110	Processing failure	
	0213	Resource limitation	
	0211	Unrecognized operation	
Warning	B604	Image size larger than image box size, the image has been demagnified.	Ignored by application and current operation continues.
	B605	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	
	B609	Image size is larger than the Image Box size. The Image has been cropped to fit.	
	B60A	Image size or Combined Print Image size is larger than the Image Box size. The Image or Combined Print Image has been decimated to fit.	

Success	0000	Image successfully stored in Image Box	The progress screen is still displayed.
*	*	Any other status code.	Deemed a failure.

2.3.1.2.6.2.1.4 Printer SOP Class

The Workstation AE supports the Printer SOP Class to receive information on the status of the printer.

For the Workstation behavior description when receiving N-Event-Report request, refer to Section 10.5.1 Printer N-Event-Report Attributes.

Also, following are the status codes the Application may send back in the **N-Event-Report** response command to the **Printer SOP Class** SCP Equipment that sent the N-Event-Report request:

Service Status	Status Code	Further Meaning	Status Code Explanation	Related Fields Sent Back to the SCP
Success	0000		If an N-EVENT-REPORT DIMSE service is received when the association is active, Print SCU handles the relevant states but the data received is ignored and send back "Success".	None

For the attribute list requested by this product and for the behavior of this product on each returned value, refer to Section 10.5.2 Printer N-Get Attributes

Following are the status codes that are more specifically processed when receiving messages from a **Print** SCP equipment for the Printer SOP Class N-GET:

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes
Failure	0107	Attribute list error	Terminate the operation. Logs store failed message along with error comment returned from SCP. Displays print failure message.
	0119	Class-instance conflict	
	0210	Duplicate invocation	
	0117	Invalid SOP instance	
	0212	Mistyped argument	
	0118	No such SOP Class	
	0112	No such SOP Instance	
	0110	Processing failure	
	0213	Resource limitation	
	0211	Unrecognized operation	
Success	0000	Success	The progress screen is still displayed.

*	*	Any other status code.	Deemed a failure.

2.3.1.2.7 Real-World Activity Report MPPS

2.3.1.2.7.1 Associated Real-World Activity

The Modality Performed Procedure Step N-CREATE is sent with status of "IN PROGRESS" when start exam is initiated by the operator. The Modality Performed Procedure Step N-SET is sent with status of "COMPLETED" when the exam is completed (all images acquired). If the exam is aborted, a status of "DISCONTINUED" is sent.

2.3.1.2.7.2 Proposed Presentation Context Table

Presentation Context Table – Proposed by Workstation AE for Activity Modality Worklist					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

2.3.1.2.7.2.1 SOP Specific DICOM Conformance Statement for Modality Performed Procedure Step SOP Class

MPPS will be created at the start of an image acquisition step; an MPPS will be set after the completion/discontinue of a post-processing step when the user selects "Complete"/"Discontinue" .

The Workstation AE includes attributes in the Modality Performed Procedure Step N-CREATE as described in Section 7.4

Following are the status codes that are more specifically processed when receiving an N-Create or N-Set response from an **MPPS** SCP equipment:

Service Status	Status Code	Further Meaning	Application Behavior When Receiving Status Code
Failure	0119	Class-instance conflict	Terminates the association and operation. Logs failure message along with error comment returned from SCP and displays failure message.
	0210	Duplicate invocation	
	0106	Invalid attribute value	
	0117	Invalid SOP instance	
	0120	Missing attribute	
	0121	Missing attribute value	
	0212	Mistyped argument	
	0105	No such attributes	

	0118	No such SOP Class	
	0112	No such SOP Instance	
	0110	Processing failure	
	0213	Resource limitation	
	0211	Unrecognized operation	
Success	0000		The progress screen is disappeared.
	0111	Duplicate SOP Instance	
*	*	Any other status code.	Deemed a failure.

2.3.1.3 Association Acceptance Policy

If the Remote AE needs to "Query/Retrieve Images", to the local system then it has to be configured in the Local system to do the same.

When the DICOM Server AE accepts an association for image storage, it will receive any images transmitted on that association and store the images on disk.

It will also respond to queries from Remote AEs by sending matching entries. Any Remote AE can request and receive a list of images on the local database. The Remote AE must be configured in the local config file list of Remote AE for it to be able to retrieve images from DICOM Server AE.

2.3.1.3.1 Real-World Activity Verification SCP

2.3.1.3.1.1 Associated Real-World Activity

An incoming Verification request will cause the Workstation AE to accept the association and respond with a verification response after the Retrieve DICOM Server AE accepts an sub-association for image storage.

2.3.1.3.1.2 Accepted Presentation Context Table

Presentation Context Table - Accepted by Workstation AE for Activity Receive Images					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

2.3.1.3.1.3 Presentation Context Acceptance Criterion

The Workstation evaluates each Presentation Context independently, and accepts any Presentation Context that matches an Abstract Syntax for any Real-World Activity.

2.3.1.3.1.4 Transfer Syntax Selection Policies

Within each Presentation Context, the Workstation will accept the first proposed transfer syntax that it also supports for that Abstract Syntax.

2.3.1.3.2 Real-World Activity Local Store SCP

2.3.1.3.2.1 Associated Real-World Activity

The Real-World Activity associated with the Receive Images operation is the storage of the image on the disk drive.

2.3.1.3.2.2 Accepted Presentation Context Table

Presentation Context Table - Accepted by Workstation AE for Activity Receive Images					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

2.3.1.3.2.2.1 SOP Specific DICOM Conformance Statement for all Storage SOP Classes

The Workstation AE provides Level 2 (FULL) Conformance, and stores all standard and private data elements of received SOP Instances.

Following are the status codes the Application may send back to the SCU Equipment after performing the requested **Storage:**

Service Status	Status Code	Further Meaning	Status Code Explanation	Related Fields Sent Back to the SCU
Failure	A700	Refused: Out of resources	Out of Disk space	(0000,0902)
Success	0000			None

2.3.1.3.2.3 Presentation Context Acceptance Criterion

The Workstation evaluates each Presentation Context independently, and accepts any Presentation Context that matches an Abstract Syntax for any Real-World Activity.

2.3.1.3.2.4 Transfer Syntax Selection Policies

Within each Presentation Context, the Workstation will accept the first proposed transfer syntax that it also supports for that Abstract Syntax.

2.3.1.3.3 Real-World Activity- Storage Commit – SCU role

2.3.1.3.3.1 Associated Real-World Activity

For Image Send with Storage Commit, the Real-World Activity of Image Send to a DICOM Store/Commit server alias on the Workstation will cause an association to be initiated from Storage Commitment SCP for the N-EVENT-REPORT.

2.3.1.3.3.2 Accepted Presentation Context Table

Presentation Context Table - Accepted by AE Elite Workstation for Activity – Storage Commit - SCP Role					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model	1.2.840.10008.1.20.1	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		

2.3.1.3.3.3 Presentation Context Acceptance Criterion

The Workstation evaluates each Presentation Context independently, and accepts any Presentation Context that matches an Abstract Syntax for any Real-World Activity.

2.3.1.3.3.4 Transfer Syntax Selection Policies

Within each Presentation Context, the Workstation will accept the first proposed transfer syntax that it also supports for that Abstract Syntax.

2.4 COMMUNICATION PROFILES

2.4.1 Supported Communication Stacks

The DICOM Upper Layer Protocol is supported using TCP/IP, as specified in DICOM PS3.8.

The TCP/IP stack is inherited from the Linux Operating System.

2.4.2 Physical Media Support

The Workstation is provided with a 10/100 Mb/s or 1Gb/s auto-sensing Ethernet interface. Additional or alternate network interfaces may be available.

2.4.3 Additional Protocol

The Workstation supports DHCP, user could configure DHCP Enable/Disable from System Setup screen. When DHCP is Enabled, then, the network information will be gotten automatically.

Default is Enabled.

2.4.4 IPv4 and IPv6 Support

The Workstation only supports IPv4.

2.5 EXTENSIONS / SPECIALIZATIONS/ PRIVATIZATIONS

Not Applicable.

2.6 CONFIGURATION

2.6.1 AE Title/Presentation Address Mapping

2.6.2 Configurable Parameters

The following fields are configurable:

The default value for these fields is blank unless otherwise specified.

Network

- Use DHCP or static IP (Default –DHCP).
- Local IP Address
- Local Subnet mask
- Default Gateway
- Local Listening Port Number (Available with Retrieve option default is 1004)

Configuration:

- Local AE Title (Default – GEHC OEC)
- Station Name
- Hospital Name

Every Remote DICOM AE SCP: (Store, Storage Commitment, MPPS, Print, Modality Worklist, Query/Retrieve)

- Server Alias
- Remote AE Title
- Remote IP Address
- Remote Port Number
- Data Transmission over TLS (Default - Unchecked)

USB Options (Media Exchange)

- Dose Summary (RDSR, SC. Default - SC)
- Remove Patient Information (Default - No).
- Include Viewer (Default - Include)
- Include Overlay (Default - Include)

Additional fields for Remote DICOM Store

- RDSR on Exam Completion or Discontinue (Default – Checked)
- Dose Summary (RDSR, SC. Default - RDSR)
- Store Overlay options (Always if Available, Never. Default - Never)

Additional fields for Remote DICOM Print

- Min Density for Printer
- Max Density for Printer
- Configuration Information
- Border Density
- Empty Density
- Number of Copies
- Print Priority
- Film Destination
- Medium Type
- Film Size
- Format
- Film Orientation

Additional fields for Remote DICOM Query Worklist Filter

- Patient Name
- Patient ID
- Requested Procedure ID
- Accession Number
- Exam Date: Today, Next 2 Days, Next 3 Days, Next 7 Days, Date Range
- Performing Physician Name
- Modality Type (RF, XA, CR or SC. Default - RF)

Additional fields for Remote DICOM Query/Retrieve Filter

- Date: Today, Next 2 Days, Next 3 Days…
- Patient Name
- Patient ID
- Accession Number
- Modality Type (RF, XA, CR or SC. Default - RF)

Note: All configurations must be performed by a GE Field Engineer.

2.7 SUPPORT OF EXTENDED CHARACTER SETS

As a Query SCU, it will similarly accept response items with ISO_IR 100 values of Specific Character Set or empty value of Specific Character Set (absence of (0008,0005) which mean usage of ASCII Chars only).

The Workstation user interface will allow the user to enter characters from the console keyboard that is within ISO 8859-1. Responses with non-compatible values of (0008,0005) will be discarded.

2.8 CODES AND CONTROLLED TERMINOLOGY

2.8.1 Fixed Coded Terminology

The product uses the fixed (non-configurable, non-extensible) coded terminology in Image SOP Instance and X-Ray Radiation Dose Structured Report attributes, as described in Section 6.4.3 where the VT is CODE. In these cases the standard or extended value for the code is defined .

2.8.2 Mapped Coded Terminology

The product maps, without change, coded terminology values supplied in Modality Worklist Scheduled Procedure Steps into Image SOP Instance and X-Ray Radiation Dose Structured Report attributes, as described in Sections 5.7 for RDSR and 6.4.1.2, 6.4.2, 6.4.3, and 6.4.5 for images.

2.9 SECURITY

2.9.1 Secure Transport Connection Profiles

The Workstation supports the BCP 195 TLS Secure Transport Connection Profile. TLS 1.0, TLS 1.1 and TLS 1.2 are used, and TLS 1.2 is preferred.

All supported cyphersuites are:

- TLS_DHE_RSA_WITH_AES_128_GCM_SHA256
- TLS_DHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_ECDH_RSA_WITH_AES_128_GCM_SHA256
- TLS_ECDH_RSA_WITH_AES_256_GCM_SHA384
- TLS_RSA_WITH_AES_128_CBC_SHA
- TLS_RSA_WITH_3DES_EDE_CBC_SHA

The private key and the Certificate used by the workstation to identify itself in the TLS negotiation with remote applications has to be provided in a local keystore file in PKCS12 format on the application host. Certficates of Certificate Authorities (CA) to validate Certificates received from remote applications during the TLS negotiation can also be provided in a local keystore file.

When a TLS integrity check fails, the connection is dropped and an A-P-ABORT indication is issued to the application together with an implementation specific provider reason. The provider reason for any A-P-ABORT indication is always "unspecified".

2.9.2 Association Level Security

The workstation checks that the Association requestor specifies the correct Called AE Title. Each AE can be configured to accept Association Request from one Calling AE Title. In addition the IP address of the requestor can be checked.

3. MEDIA STORAGE CONFORMANCE STATEMENT

3.1 INTRODUCTION

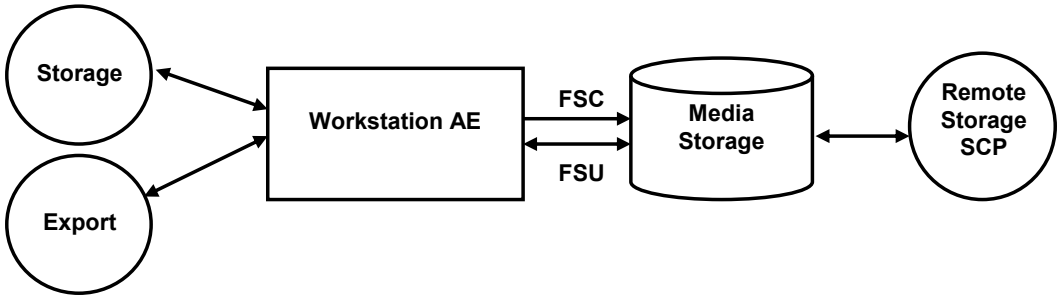
This section of the DICOM conformance statement specifies the Workstation AE compliance to DICOM requirements for **Media Interchange**. It details the DICOM Media Storage Application Profiles and roles that are supported by this product.

The Workstation AE is able to export images and RDSR to DICOM media.

3.1.1 Application Data Flow Diagram

The media interchange application model for the Workstation AE is shown in the following Illustration:

ILLUSTRATION 3–1
WORKSTATION AE MEDIA INTERCHANGE APPLICATION MODEL AND DATA FLOW DIAGRAM



The Workstation AE supports the General Purpose USB Interchange profiles.

3.1.2 Functional Definition of AE's

The Workstation AE can perform these functions:

- Create a new DICOM File-Set on Media
- Update a DICOM File-Set by adding new SOP instances to the media which supports multi-session.

3.1.3 Sequencing of Real-World Activities

Storage/Export – Images are acquired and archived on Workstation; From the Image Directory screen, images/RDSR can be selected and copied to media; Images/RDSR can be viewed by any DICOM application that supports Media Exchange FSR and X-Ray Radiation Dose Structured Reports.

Directory Listing – During the Image Copy, user could choice copying image/RDSR with a Media Viewer, then the images/RDSR will be copied with a Media Viewer instance; Images/RDSR can be viewed by this media viewer only on Windows OS (Independent of the Workstation AE).

3.1.4 File Meta Information Options (See PS3.10)

The File Meta-Information for this implementation is:

File Meta-Information Version	1
OEC One ASD Implementation UID	1.2.840.113619.6.320
OEC One ASD Implementation Version Name	GEHC_OEC_300

3.2 AE SPECIFICATIONS

3.2.1 Workstation AE Specification

The Workstation Application Entity provides standard conformance to DICOM Interchange Option of the Media Storage Service Class. The supported Application Profiles and roles are listed below.

Supported Application Profile	Real World Activity	Role	Option
STD-GEN-USB	Storage/ Export	FSC,FSU	Interchange

3.2.1.1 File Meta Information for the Workstation Application Entity

Following are the values set in the File Meta Information for this AE Title:

Source Application Entity Title	Not used
OEC One ASD Implementation UID	1.2.840.113619.6.320
OEC One ASD Implementation Version Name	GEHC_OEC_300

3.2.1.2 Real-World Activities for the Workstation Application Entity

3.2.1.2.1 Real-World Activity Storage

The Workstation AE acts as a FSC/FSU when requested to copy SOP instance from local database to the interchange media.

When user selects "Storage" function, the selected images should be saved as DICOM SOP instances and copied to media. The DICOM File set on the media should be created or updated accordingly.

3.2.1.2.1.1 Media Storage Application Profile for the RWA Update File Set

For the list of Application Profiles that invoke this AE for the Real-World Activity Storage, see the Table in Section 3.2.1 "Workstation AE Specification" where the table describing the Application Profiles and Real-World Activity is defined.

3.2.1.2.1.1.1 Options for STD-GEN-USB Application Profile

Following are the optional SOP Classes supported by this AE. All SOP Instances use the Explicit VR Little Endian Uncompressed Transfer Syntax, UID 1.2.840.10008.1.2.1.

SOP Class	SOP Class UID
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1

Common DICOMDIR Directory Records created by this AE will include key attributes as described in Section 9. Following are the Additional DICOMDIR Keys supported for this profile:

ADDITIONAL DICOMDIR KEYS

Key Attribute	Tag	Directory Record Type	Type	Notes
Image Type	(0008,0008)	IMAGE	1C	FSC/FSU: Present when the DICOMDIR file is created and this value should be extracted from referenced image file.

3.2.2 Media Viewer AE Specification

The Media Viewer Application Entity provides standard conformance to DICOM Interchange of the Media Storage Service Class. The supported Application Profiles and roles are listed below.

Supported Application Profile	Real World Activity	Role
STD-GEN-USB	Directory Listing	FSR

3.2.2.1 File Meta Information for the Media Viewer Application Entity

Following are the values set in the File Meta Information for this AE Title:

Source Application Entity Title	**Not used**
Media Viewer Implementation UID	**Not used**
Implementation Version Name	**Not used**

Since Media Viewer just used to read file-set and display image, so, above information could not be set by Media Viewer.

3.2.2.2 Real-World Activities for the Media Viewer Application Entity

3.2.2.2.1 Real-World Activity Directory Listing

The Media Viewer AE acts as a FSR when listing the directory information from interchange media.

When user load the media on Window OS, the Media Viewer will read the DICOM File-Set and display/list the DICOM directory entries for those instances in the File-Set on the media.

3.2.2.2.1.1 Media Storage Application Profile for the RWA Directory Listing

For the list of Application Profiles that invoke this AE for the Real-World Activity Directory Listing, see the Table in Section 3.2.3 "Media Viewer AE Specification" where the table describing the Application Profiles and Real-World Activity is defined.

3.2.2.2.1.1.1 STD-GEN-USB Application Profile

Following are the SOP Classes supported by this AE and only the Explicit VR Little Endian Uncompressed Transfer Syntax (UID 1.2.840.10008.1.2.1) is supported.

SOP Class	SOP Class UID
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1

Common DICOMDIR Directory Records read by this AE will include key attributes as described in Section 9. Following are the Additional DICOMDIR Keys supported for this profile:

Key Attribute	Tag	Directory Record Type	Type	Notes
Image Type	(0008,0008)	IMAGE	1C	FSR: Used.

3.2.3 Media Viewer AE Specification

The Media Viewer Application Entity provides standard conformance to DICOM Interchange of the Media Storage Service Class. The supported Application Profiles and roles are listed below.

Supported Application Profile	Real World Activity	Role
STD-GEN-USB	Directory Listing	FSR

3.3 AUGMENTED AND PRIVATE APPLICATION PROFILES

No augmented/private profile is implemented.

3.4 EXTENSIONS / SPECIALIZATIONS / PRIVATIZATIONS

No Extensions / Specializations / Privatizations are implemented.

3.5 CONFIGURATION

Media Options (Media Exchange)

- Dose Summary (RDSR, SC. Default - SC)
- Remove Patient Information (Default - No).
- Include Viewer (Default - Include)
- Include Overlay(Default - Include)

3.6 SUPPORT OF EXTENDED CHARACTER SETS

The Workstation AE will support fully only the ISO_IR 100 as extended character sets for media storage.

4. X-RAY ANGIOGRAPHIC INFORMATION OBJECT IMPLEMENTATION

4.1 INTRODUCTION

This section specifies the use of the DICOM X-Ray Angiographic Image IOD to represent the information included in X-Ray Angiographic Images by this implementation. Corresponding attributes are conveyed using the module construct.

4.2 WORKSTATION MAPPING OF DICOM ENTITIES

The Workstation maps DICOM Information Entities to local Information Entities in the product's database and user interface.

TABLE 4-1
MAPPING OF DICOM ENTITIES TO WORKSTATION ENTITIES

DICOM IE	Workstation Entity
Patient	Patient
Study	Exam
Series	Series
Equipment	Equipment
Image	Image

4.3 IOD MODULE TABLE

The X-Ray Angiographic Image Information Object Definition comprises the modules of the following table, plus Standard Extended and Private attributes. Standard Extended and Private attributes are described in Section 4.5.

TABLE 4-2
X-RAY ANGIOGRAPHIC IMAGE IOD MODULE

Entity Name	Module Name	Usage	Reference
Patient	Patient	Used	4.4.1.1
	Clinical Trial Subject	Not Used	N/A
Study	General Study	Used	4.4.2.1
	Patient Study	Used	4.4.2.2
	Clinical Trial Study	Not Used	N/A
Series	General Series	Used	4.4.3.1
	Clinical Trial Series	Not Used	N/A
Frame of Reference	Synchronization	Not Used	N/A
Equipment	General Equipment	Used	4.4.4.1
Image	General Image	Used	4.4.5.1
	Image Pixel	Used	4.4.5.2

Contrast/Bolus	Used	4.4.5.3
Cine	Used	4.4.5.4
Multi-Frame	Used	4.4.5.5
Frame Pointers	Not Used	N/A
Mask	Used	4.4.5.6
Display Shutter	Not Used	N/A
Device	Not Used	N/A
Intervention	Not Used	N/A
X-Ray Image	Used	4.4.5.7
X-Ray Acquisition	Used	4.4.5.8
X-Ray Collimator	Not Used	N/A
X-Ray Table	Not Used	N/A
XA Positioner	Used	4.4.5.9
DX Detector	Not Used	N/A
Overlay Plane	Used	4.4.5.10
Multi-Frame Overlay	Not Used	N/A
Modality LUT	Not Used	N/A
VOI LUT	Used	4.4.5.11
SOP Common	Used	4.4.5.12
Frame Extraction	Not Used	N/A

4.4 INFORMATION MODULE DEFINITIONS

Please refer to DICOM Part 3 (Information Object Definitions) for a description of each of the entities, modules, and attributes contained within the X-Ray Angiographic Information Object.

The following modules are included to convey Enumerated Values, Defined Terms, and Optional Attributes supported and/or expected. Type 1 & Type 2 Attributes are also included for completeness and to define what values they may take and where these values are obtained from when generating the instance as well as what are the expected values when loading such instance. It should be noted that they are the same ones as defined in the DICOM Standard Part 3 (Information Object Definitions). Also note that Attributes not present in tables are not supported.

4.4.1 Patient Entity Modules

4.4.1.1 Patient Module

TABLE 4-3
PATEINT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	May be entered from user interface or got from Worklist. Supports 5 different components delimited by "^". Supports a maximum length of 64 bytes including the delimiter.
Patient ID	(0010,0020)	2	May be entered from user interface or got from Worklist. Truncated to 64 bytes, end truncated.

Issuer of Patient ID	(0010,0021)	3	May be entered from user interface or got from Worklist. Truncated to 64 bytes, end truncated.
Patient's Birth Date	(0010,0030)	2	May be entered from user interface or got from Worklist Truncated to 8 bytes, end truncated
Patient's Sex	(0010,0040)	2	May be entered from user interface or got from Worklist. Truncated to 2 bytes, end truncated
Referenced Patient Sequence	(0008,1120)	3	Not Used
>Include 'SOP Instance Reference Macro'			
Patient's Birth Time	(0010,0032)	3	Not Used
Other Patient IDs	(0010,1000)	3	Not Used
Other Patient IDs Sequence	(0010,1002)	3	Not Used
>Patient ID	(0010,0020)	1	Not Used
>Issuer of Patient ID	(0010,0021)	1	Not Used
>Type of Patient ID	(0010,0022)	1	Not Used
Other Patient Names	(0010,1001)	3	Not Used
Ethnic Group	(0010,2160)	3	Not Used
Patient Comments	(0010,4000)	3	May be entered from user interface or got from Worklist From user interface truncated to 512 bytes. From worklist truncated to 10240 bytes.
Patient Species Description	(0010,2201)	1C	Not Used
Patient Species Code Sequence	(0010,2202)	1C	Not Used
>Include 'Code Sequence Macro'			
Patient Breed Description	(0010,2292)	2C	Not Used
Patient Breed Code Sequence	(0010,2293)	2C	Not Used
>Include 'Code Sequence Macro'			
Breed Registration Sequence	(0010,2294)	2C	Not Used
>Breed Registration Number	(0010,2295)	1	Not Used
>Breed Registry Code Sequence	(0010,2296)	1	Not Used
>>Include 'Code Sequence Macro'			
Responsible Person	(0010,2297)	2C	Not Used
Responsible Person Role	(0010,2298)	1C	Not Used
Responsible Organization	(0010,2299)	2C	Not Used
Patient Identity Removed	(0012,0062)	3	Used. If Patient Information is removed then set to "YES", otherwise set to "NO"
De-identification Method	(0012,0063)	1C	Used. If Patient Information is removed. Set to "Limited Data Set" in this case
De-identification Method Code Sequence	(0012,0064)	1C	Not Used

>Include 'Code Sequence Macro'	

4.4.2 Study Entity Modules

4.4.2.1 General Study Module

TABLE 4-4
GENERAL STUDY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Study Instance UID	(0020,000D)	1	The product will adopt the Study Instance UID which is returned in the MWL response. If there is no Study Instance UID returned from MWL server, then new Study Instance UID will be created.
Study Date	(0008,0020)	2	This value is set to the exam created date.
Study Time	(0008,0030)	2	This value is set to the exam created time.
Referring Physician's Name	(0008,0090)	2	May be entered from the user interface or got from Worklist.
Referring Physician Identification Sequence	(0008,0096)	3	Not Used
>Include 'Person Identification Macro'			
Study ID	(0020,0010)	2	Got from Worklist or generated by equipment.
Accession Number	(0008,0050)	2	May be entered from the user interface or got from Worklist.
Study Description	(0008,1030)	3	May be entered from the user interface or got from Worklist. The default value will be set as Requested Procedure Description when the tag got from MWL is not empty. Else this value will be set as Procedure Description on user interface.
Physician(s) of Record	(0008,1048)	3	Not Used
Physician(s) of Record Identification Sequence	(0008,1049)	3	Not Used
>Include 'Person Identification Macro'			
Name of Physician(s) Reading Study	(0008,1060)	3	Not Used
Physician(s) Reading Study Identification Sequence	(0008,1062)	3	Not Used
>Include 'Person Identification Macro'			
Referenced Study Sequence	(0008,1110)	3	Got from MWL.
>Include 'SOP Instance Reference Macro'			
Procedure Code Sequence	(0008,1032)	3	Got from Worklist, else set as empty.
>Include 'Code Sequence Macro'			

4.4.2.2 Patient Study Module

TABLE 4-5
PATIENT STUDY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description

Admitting Diagnoses Description	(0008,1080)	3	Not Used
Admitting Diagnoses Code Sequence	(0008,1084)	3	Not Used
>Include 'Code Sequence Macro'			
Patient's Age	(0010,1010)	3	Not Used
Patient's Size	(0010,1020)	3	May be entered from user interface or got from Worklist. Truncated to 16 bytes, end truncated
Patient's Weight	(0010,1030)	3	May be entered from user interface or got from Worklist. Truncated to 16 bytes, end truncated
Occupation	(0010,2180)	3	Not Used
Additional Patient's History	(0010,21B0)	3	Not Used
Admission ID	(0038,0010)	3	Not Used
Service Episode ID	(0038,0060)	3	Not Used
Service Episode Description	(0038,0062)	3	Not Used
Patient's Sex Neutered	(0010,2203)	2C	Not Used

4.4.3 Series Entity Modules

4.4.3.1 General Series Module

TABLE 4-6
GENERAL SERIES MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	Defined by the user by setting the modality on the DICOM Server or Media Image Save.
Series Instance UID	(0020,000E)	1	Created by equipment, using prefix: 1.2.840.113619.2.320.+MAC+seriesIndicator(20)+TimeStamp_Exam MAC: Number string of device MAC address.
Series Number	(0020,0011)	2	A number that identifies this Series.
Laterality	(0020,0060)	2C	Laterality of (possibly paired) body part examined.
Series Date	(0008,0021)	3	This value is set to the first shot date.
Series Time	(0008,0031)	3	This value is set to the first shot time.
Performing Physicians' Name	(0008,1050)	3	Get from the Worklist scheduled performing physician, or the user can enter from the user interface.
Performing Physician Identification Sequence	(0008,1052)	3	Not Used
>Include 'Person Identification Macro'			
Protocol Name	(0018,1030)	3	When using MWL, if Scheduled Protocol Sequence Code Meaning is not empty then this value is Scheduled Protocol Sequence Code Meaning, else this value is Scheduled Procedure Step Description.

			May be entered from user interface or set to "Unknown Protocol" for local created exam.
Series Description	(0008,103E)	3	The value equal protocol Name.
Operators' Name	(0008,1070)	3	Not Used
Operator Identification Sequence	(0008,1072)	3	Not Used
>Include 'Person Identification Macro'			
Referenced Performed Procedure Step Sequence	(0008,1111)	3	Used.
>Include 'SOP Instance Reference Macro'			
Related Series Sequence	(0008,1250)	3	Not Used
>Study Instance UID	(0020,000D)	1	Not Used
>Series Instance UID	(0020,000E)	1	Not Used
>Purpose of Reference Code Sequence	(0040,A170)	2	Not Used
>>Include 'Code Sequence Macro'			
Body Part Examined	(0018,0015)	3	The value is empty.
Patient Position	(0018,5100)	2C	The value specifies the position of the patient relative to the imaging equipment space. This Attribute is intended for annotation purposes only. It does not provide an exact mathematical relationship of the patient to the imaging equipment.
Smallest Pixel Value in Series	(0028,0108)	3	Not Used
Largest Pixel Value in Series	(0028,0109)	3	Not Used
Request Attributes Sequence	(0040,0275)	3	Used
>Requested Procedure ID	(0040,1001)	1C	This value could got from MWL response, or the user can enter from the user interface.
>Accession Number	(0008,0050)	3	Not Used
>Study Instance UID	(0020,000D)	3	Not Used
>Referenced Study Sequence	(0008,1110)	3	Not Used
>> Include 'SOP Instance Reference Macro'			
>Requested Procedure Description	(0032,1060)	3	This value could got from MWL response, or the user can enter from the user interface.
>Requested Procedure Code Sequence	(0032,1064)	3	Sequence set with values from the MWL. No user input is used.
>>Include 'Code Sequence Macro'			
>Reason for the Requested Procedure	(0040,1002)	3	Not Used
>Reason for Requested Procedure Code Sequence	(0040,100A)	3	Not Used
>>Include' Code Sequence Macro'			
>Scheduled Procedure Step ID	(0040,0009)	1C	This value could got from MWL response, or the user can enter from the user interface.
>Scheduled Procedure Step Description	(0040,0007)	3	This value could got from MWL response, or the user can enter from the user interface.
>Scheduled Protocol Code Sequence	(0040,0008)	3	Sequence set with values from the MWL. No user input is used.

>>Include 'Code Sequence Macro'			
>>Protocol Context Sequence	(0040,0440)	3	Not Used
>>>Include 'Content Item Macro'			
>>>Content Item Modifier Sequence	(0040,0441)	3	Not Used
>>>>Include 'Content Item Macro'			
Performed Procedure Step ID	(0040,0253)	3	Set to the value of 'Scheduled Procedure Step ID' value from MWL. Or, Set to value entered by the user. Or, Set to value generated by the equipment.
Performed Procedure Step Start Date	(0040,0244)	3	Used
Performed Procedure Step Start Time	(0040,0245)	3	Used
Performed Procedure Step Description	(0040,0254)	3	Used
Performed Protocol Code Sequence	(0040,0260)	3	Got from MWL.
>Include 'Code Sequence Macro'			
>Protocol Context Sequence	(0040,0440)	3	Not Used
>>Include 'Content Item Macro'			
>>Content Item Modifier Sequence	(0040,0441)	3	Not Used
>>>Include 'Content Item Macro'			
Comments on the Performed Procedure Step	(0040,0280)	3	Not Used

4.4.4 Equipment Entity Modules

4.4.4.1 General Equipment Module

TABLE 4-7
GENERAL EQUIPMENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	2	This value is set to "GE Hualun Medical Systems, Co. Ltd".
Institution Name	(0008,0080)	3	Configurable by user on setup screen (The field name is "Hospital Name").
Institution Address	(0008,0081)	3	Not Used
Station Name	(0008,1010)	3	Configurable by user on DICOM setup screen.
Institutional Department Name	(0008,1040)	3	Not Used
Manufacturer's Model Name	(0008,1090)	3	This value is set to type and model of the system: "OEC One ASD".
Device Serial Number	(0018,1000)	3	Configurable during system install.
Software Versions	(0018,1020)	3	This value is set to workstation software version.
Gantry ID	(0018,1008)	3	Not Used
Spatial Resolution	(0018,1050)	3	Not Used
Date of Last Calibration	(0018,1200)	3	Not Used
Time of Last Calibration	(0018,1201)	3	Not Used

Pixel Padding Value	(0028,0120)	1C	Not Used

4.4.5 Image Entity Modules

4.4.5.1 General Image Module

TABLE 4-8
GENERAL IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020,0013)	2	This value is set to image number.
Patient Orientation	(0020,0020)	2C	The value is empty.
Content Date	(0008,0023)	2C	This value is set to the date image was taken.
Content Time	(0008,0033)	2C	This value is set to the time image was taken.
Image Type	(0008,0008)	3	See 4.4.5.7.1
Acquisition Number	(0020,0012)	3	This value is set to shot number.
Acquisition Date	(0008,0022)	3	Not Used
Acquisition Time	(0008,0032)	3	Not Used
Acquisition DateTime	(0008,002A))	3	This value is set to shot DateTime.
Referenced Image Sequence	(0008,1140)	3	Not Used
>Include 'SOP Instance Reference Macro'			
>Purpose of Reference Code Sequence	(0040,A170)	3	Not Used
>>Include 'Code Sequence Macro'			
Derivation Description	(0008,2111)	3	Not Used
Derivation Code Sequence	(0008,9215)	3	Not Used
>Include 'Code Sequence Macro'			
Source Image Sequence	(0008,2112)	3	Not Used
>Include 'SOP Instance Reference Macro'			
>Purpose of Reference Code Sequence	(0040,A170)	3	Not Used
>>Include 'Code Sequence Macro'			
>Spatial Locations Preserved	(0028,135A)	3	Not Used
>Patient Orientation	(0020,0020)	1C	Not Used
Referenced Instance Sequence	(0008,114A)	3	Not Used
>Include 'SOP Instance Reference Macro'			
>Purpose of Reference Code Sequence	(0040,A170)	1	Not Used
>>Include 'Code Sequence Macro'			
Images in Acquisition	(0020,1002)	3	Not Used
Image Comments	(0020,4000)	3	Not Used
Quality Control Image	(0028,0300)	3	Not Used
Burned In Annotation	(0028,0301)	3	Not Used
Lossy Image Compression	(0028,2110)	3	Not Used
Lossy Image Compression Ratio	(0028,2112)	3	Not Used
Lossy Image Compression Method	(0028,2114)	3	Not Used

Icon Image Sequence	(0088,0200)	3	Not Used
>Include 'Image Pixel Macro'			
Presentation LUT Shape	(2050,0020)	3	Not Used

4.4.5.2 Image Pixel Module

TABLE 4-9
IMAGE PIXEL MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028,0002)	1	The value is set to 1.
Photometric Interpretation	(0028,0004)	1	The value is set to "MONOCHROME2".
Rows	(0028,0010)	1	This value is set to 1920. Note: For dose summary snapshot, this value will be 1920.
Columns	(0028,0011)	1	This value is set to 1920. Note: For dose summary snapshot, this value will be 1920.
Bits Allocated	(0028,0100)	1	This value is set to 16. Note: For dose summary snapshot, this value will be 8.
Bits Stored	(0028,0101)	1	This value is set to 16 Note: For dose summary snapshot, this value will be 8.
High Bit	(0028,0102)	1	This value is set to 13. Note: For dose summary snapshot, this value will be 7.
Pixel Representation	(0028,0103)	1	This value is set to 0 for unsigned integer.
Pixel Data	(7FE0,0010)	1C	Pixel data of the image.
Planar Configuration	(0028,0006)	1C	Not Used
Pixel Aspect Ratio	(0028,0034)	1C	Not Used
Smallest Image Pixel Value	(0028,0106)	3	Not Used
Largest Image Pixel Value	(0028,0107)	3	Not Used
Red Palette Color Lookup Table Descriptor	(0028,1101)	1C	Not Used
Green Palette Color Lookup Table Descriptor	(0028,1102)	1C	Not Used
Blue Palette Color Lookup Table Descriptor	(0028,1103)	1C	Not Used
Red Palette Color Lookup Table Data	(0028,1201)	1C	Not Used
Green Palette Color Lookup Table Data	(0028,1202)	1C	Not Used
Blue Palette Color Lookup Table Data	(0028,1203)	1C	Not Used
ICC Profile	(0028,2000)	3	Not Used
Pixel Data Provider URL	(0028,7FE0)	1C	Not Used
Pixel Padding Range Limit	(0028,0121)	1C	Not Used

4.4.5.3 Contrast/Bolus Module

TABLE 4-10
CONTRAST/BOLUS MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Contrast/Bolus Agent	(0018,0010)	2	Got from MWL, else set as empty.
Contrast/Bolus Agent Sequence	(0018,0012)	3	Not Used
>Include 'Code Sequence Macro'			
Contrast/Bolus Route	(0018,1040)	3	Not Used
Contrast/Bolus Administration Route Sequence	(0018,0014)	3	Not Used
>Include 'Code Sequence Macro'			
>Additional Drug Sequence	(0018,002A)	3	Not Used
>>Include 'Code Sequence Macro'			
Contrast/Bolus Volume	(0018,1041)	3	Not Used
Contrast/Bolus Start Time	(0018,1042)	3	Not Used
Contrast/Bolus Stop Time	(0018,1043)	3	Not Used
Contrast/Bolus Total Dose	(0018,1044)	3	Not Used
Contrast Flow Rate(s)	(0018,1046)	3	Not Used
Contrast Flow Duration(s)	(0018,1047)	3	Not Used
Contrast/Bolus Ingredient	(0018,1048)	3	Not Used
Contrast/Bolus Ingredient Concentration	(0018,1049)	3	Not Used

4.4.5.4 Cine

TABLE 4-11
CINE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Preferred Playback Sequencing	(0018,1244)	3	Value is 0
Frame Time	(0018,1063)	1C	Nominal time (in msec) per individual frame
Frame Time Vector	(0018,1065)	1C	Not Used
Start Trim	(0008,2142)	3	Value is 1
Stop Trim	(0008,2143)	3	Value equals number of frames
Recommended Display Frame Rate	(0008,2144)	3	Value equals number of frames per second
Cine Rate	(0018,0040)	3	Number of frames per second
Frame Delay	(0018,1066)	3	Not Used
Image Trigger Delay	(0018,1067)	3	Not Used
Effective Duration	(0018,0072)	3	Total time in seconds that data was actually taken for the entire Multi-frame image.
Actual Frame Duration	(0018,1242)	3	Elapsed time of data acquisition in msec per each frame.
Multiplexed Audio Channels Description Code Sequence	(003A,0300)	2C	Not Used
>Channel Identification Code	(003A,0301)	1	Not Used
>Channel Mode	(003A,0302)	1	Not Used

>Channel Source Sequence	(003A,0300)	1	Not Used
>>Include Table 8.8-1 "Code Sequence Macro Attributes"			

4.4.5.5 Multi-Frame

TABLE 4-12
MULTI-FRAME MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Number of Frames	(0028,0008)	1	Number of frames in a Multi-frame Image
Frame Increment Pointer	(0028,0009)	1	Value is "(0x0018, 0x1063)"
Stereo Pairs Present	(0022,0028)	3	Not Used

4.4.5.6 Mask

TABLE 4-13
MASK MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Mask Subtraction Sequence	(0028,6100)	1	Used
>Mask Operation	(0028,6101)	1	Value is NONE
>Subtraction Item ID	(0028,9416)	1C	Not Used
>Applicable Frame Range	(0028,6102)	1C	Not Used
>Mask Frame Numbers	(0028,6110)	1C	Not Used
>Contrast Frame Averaging	(0028,6112)	3	Not Used
>Mask Sub-pixel Shift	(0028,6114)	3	Not Used
>TID Offset	(0028,6120)	2C	Not Used
>Mask Operation Explanation	(0028,6190)	3	Not Used
>Mask Selection Mode	(0028,9454)	3	Not Used
Recommended Viewing Mode	(0028,1090)	2	Value is NAT

4.4.5.7 X-Ray Image Module

TABLE 4-14
X-RAY IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Frame Increment Pointer	(0028,0009)	1	Value is “(0x0018, 0x1063)"
Lossy Image Compression	(0028,2110)	1C	Not Used
Image Type	(0008,0008)	1	See 4.4.5.7.1
Pixel Intensity Relationship	(0028,1040)	1	Value is DISP
Samples per Pixel	(0028,0002)	1	Value is 1
Photometric Interpretation	(0028,0004)	1	Value is MONOCHROME2
Bits Allocated	(0028,0100)	1	Value is 16 Note: For dose summary snapshot, this value will be 8.
Bits Stored	(0028,0101)	1	Value is 16 Note: For dose summary snapshot, this value will be 8.

High Bit	(0028,0102)	1	Value is 11 Note: For dose summary snapshot, this value will be 7.
Pixel Representation	(0028, 0103)	1	Value is 0000H
Scan Options	(0018,0022)	3	Not Used.
Anatomic Region Sequence	(0008,2218)	3	Not Used.
> Include 'Code Sequence Macro'			
>Anatomic Region Modifier Sequence	(0008,2220)	3	Not Used
>> Include 'Code Sequence Macro'			
Primary Anatomic Structure Sequence	(0008,2228)	3	Not Used
> Include 'Code Sequence Macro'			
>Primary Anatomic Structure Modifier Sequence	(0008,2230)	3	Not Used
>> Include 'Code Sequence Macro'			
R Wave Pointer	(0028,6040)	3	Not Used
Reference Image Sequence	(0008,1140)	1C	Not Used
>Referenced SOP Class UID	(0008,1150)	1	Not Used
>Referenced SOP Class UID	(0008,1155)	1	Not Used
>Referenced Frame Number	(0008,1160)	1C	Not Used
>Referenced Segment Number	(0062,000B)	1C	Not Used
>Purpose of Reference Code Sequence	(0040,A170)	3	Not Used
>> Include 'Code Sequence Macro'			
Derivation Description	(0008,2111)	3	Not Used
Acquisition Device Processing Description	(0018,1400)	3	Not Used
Frame Label Vector	(0018,2002)	3	Not Used
Frame Dimension Pointer	(0028,000A)	3	Not Used
Calibration Image	(0050,0004)	3	Not Used

4.4.5.7.1 Image Type

Define the values of Image Type (0008,0008) that may be sent and under what circumstances, or refer to the more general description in the General Image Module.

Value 1 shall have the following Enumerated Values:

- ORIGINAL identifies an Original Image
- DERIVED identifies a Derived Image.

Value 2 shall have the following Enumerated Value:

- PRIMARY identifies a Primary Image
- SECONDARY identifies a Secondary Image.

Specify which Enumerated Values of Value 3 are created/supported:

- SINGLE PLANE

Note: This value will always is "ORIGINAL\PRIMARY\SINGLE PLANE" in the system.

4.4.5.8 X-Ray Acquisition Module

TABLE 4-15
X-RAY ACQUISITION MODULE

Attribute Name	Tag	Type	Attribute Description
KV	(0018,0060)	2	KVP of the shot.
Radiation Setting	(0018,1155)	1	All X-Ray modes send 'SC' except for Digital Spot which sends 'GR'.
X-Ray Tube Current	(0018,1151)	2C	Used
X-Ray Tube Current in µA	(0018,8151)	3	Used
Exposure Time	(0018,1150)	2C	mSec of the shot.
Exposure Time in microS	(0018,8150)	3	Not Used
Exposure	(0018,1152)	2C	Not Used
Exposure in microAs	(0018,1153)	3	Not Used
Grid	(0018,1166)	3	Not Used
Average Pulse Width	(0018,1154)	3	Got value from configure file. Only used when 0018,115A is PULSED.
Radiation Mode	(0018,115A)	3	The value reported will be 'CONTINUOUS' for all X-Ray modes except pulsed mode which will report 'PULSED'.
Type of Filters	(0018,1161)	3	Not Used
Intensifier Size	(0018,1162)	3	Not Used
Field of View Shape	(0018,1147)	3	Not Used
Field of View Dimension(s)	(0018,1149)	3	Not Used
Imager Pixel Spacing	(0018,1164)	3	unit is mm, Imager Pixel Spacing = Row Imager Pixel Spacing\Column Imager Pixel Spacing.
Pixel Spacing	(0028,0030)	1C	Used when calibration data exists, unit is mm, Pixel Spacing = Row Pixel Spacing\Column Pixel Spacing.
Pixel Spacing Calibration Type	(0028,0A02)	3	Not Used
Pixel Spacing Calibration Description	(0028,0A04)	1C	Not Used
Focal Spot	(0018,1190)	3	Not Used
Image and Fluoroscopy Area Dose Product	(0018,115E)	3	DAP of the shot.

4.4.5.9 XA Positioner Module

TABLE 4-16
XA POSITIONER MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Distance Source to Patient	(0018,1111)	3	Not Used
Distance Source to Detector	(0018,1110)	3	Got value from configure file.
Estimated Radiographic Magnification Factor	(0018,1114)	3	Not Used

Positioner Motion	(0018,1500)	2C	Value is "STATIC".
Positioner Primary Angle	(0018,1510)	2	Send with empty.
Positioner Secondary Angle	(0018,1511)	2	Send with empty.
Positioner Primary Angle Increment	(0018,1520)	2C	Not Used
Positioner Secondary Angle Increment	(0018,1521)	2C	Not Used
Detector Primary Angle	(0018,1530)	3	Not Used
Detector Secondary Angle	(0018,1531)	3	Not Used

4.4.5.10 Overlay Plane Module

The Workstation supports up to 1 overlay in an image.

TABLE 4-17
OVERLAY PLANE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Overlay Rows	(60xx,0010)	1	Value is 1920.
Overlay Columns	(60xx,0011)	1	Value is 1920.
Overlay Type	(60xx,0040)	1	Value is G.
Overlay Origin	(60xx,0050)	1	Value is 0\0.
Overlay Bits Allocated	(60xx,0100)	1	1
Overlay Bit Position	(60xx,0102)	1	0
Overlay Data	(60xx,3000)	1	Overlay pixel data
Overlay Description	(60xx,0022)	3	Value is "Annotation/Measurement Graphic Layer".
Overlay Subtype	(60xx,0045)	3	Not Used
Overlay Label	(60xx,1500)	3	Value is "Annotation/Measurement Graphic Layer".
ROI Area	(60xx,1301)	3	Not Used
ROI Mean	(60xx,1302)	3	Not Used
ROI Standard Deviation	(60xx,1303)	3	Not Used

4.4.5.11 VOI LUT module

TABLE 4-18
VOI LUT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
VOI LUT Sequence	(0028,3010)	1C	Not Used
>LUT Descriptor	(0028,3002)	1	Not Used
>LUT Explanation	(0028,3003)	3	Not Used
>LUT Data	(0028,3006)	1	Not Used
Window Center	(0028,1050)	1C	Only one value is present. Set to 2^bitsStored/2 when export to DICOM images
Window Width	(0028,1051)	1C	Only one value is present. Set to 2^bitsStored – 1 when export to DICOM images

Window Center & Width Explanation	(0028,1055)	3	Not Used

4.4.5.12 SOP Common Module

TABLE 4-19
SOP COMMON MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	1	SOP Class UID for the Class that the dataset contains, just XA UID.
SOP Instance UID	(0008,0018)	1	Created by equipment, using prefix: 1.2.840.113619.2.320.+MAC+imageIndicator(40)+TimeStamp_Exam MAC: Number string of device MAC address.
Specific Character Set	(0008,0005)	1C	Always set to ISO_IR 100(= Latin Alphabet No. 1)
Instance Creation Date	(0008,0012)	3	Not Used
Instance Creation Time	(0008,0013)	3	Not Used
Instance Creator UID	(0008,0014)	3	Not Used
Related General SOP Class UID	(0008,001A)	3	Not Used
Original Specialized SOP Class UID	(0008,001B)	3	Not Used
Coding Scheme Identification Sequence	(0008,0110)	3	Not Used
>Coding Scheme Designator	(0008,0102)	1	Not Used
>Coding Scheme Registry	(0008,0112)	1C	Not Used
>Coding Scheme UID	(0008,010C)	1C	Not Used
>Coding Scheme External ID	(0008,0114)	2C	Not Used
>Coding Scheme Name	(0008,0115)	3	Not Used
>Coding Scheme Version	(0008,0103)	3	Not Used
>Coding Scheme Responsible Organization	(0008,0116)	3	Not Used
Timezone Offset From UTC	(0008,0201)	3	Not Used
Contributing Equipment Sequence	(0018,A001)	3	Not Used
>Purpose of Reference Code Sequence	(0040,A170)	1	Not Used
>>Include 'Code Sequence Macro'			
>Manufacturer	(0008,0070)	1	Not Used
>Institution Name	(0008,0080)	3	Not Used
>Institution Address	(0008,0081)	3	Not Used
>Station Name	(0008,1010)	3	Not Used
>Institutional Department Name	(0008,1040)	3	Not Used
>Manufacturer's Model Name	(0008,1090)	3	Not Used
>Device Serial Number	(0018,1000)	3	Not Used
>Software Versions	(0018,1020)	3	Not Used
>Spatial Resolution	(0018,1050)	3	Not Used

>Date of Last Calibration	(0018,1200)	3	Not Used
>Time of Last Calibration	(0018,1201)	3	Not Used
>Contribution DateTime	(0018,A002)	3	Not Used
>Contribution Description	(0018,A003)	3	Not Used
Instance Number	(0020,0013)	3	Image number.
SOP Instance Status	(0100,0410)	3	Not Used
SOP Authorization Date and Time	(0100,0420)	3	Not Used
SOP Authorization Comment	(0100,0424)	3	Not Used
Authorization Equipment Certification Number	(0100,0426)	3	Not Used
MAC Parameters Sequence	(4FFE,0001)	3	Not Used
>MAC ID Number	(0400,0005)	1	Not Used
>MAC Calculation Transfer Syntax UID	(0400,0010)	1	Not Used
>MAC Algorithm	(0400,0015)	1	Not Used
>Data Elements Signed	(0400,0020)	1	Not Used
Digital Signatures Sequence	(FFFA,FFFA)	3	Not Used
>MAC ID Number	(0400,0005)	1	Not Used
>Digital Signature UID	(0400,0100)	1	Not Used
>Digital Signature DateTime	(0400,0105)	1	Not Used
>Certificate Type	(0400,0110)	1	Not Used
>Certificate of Signer	(0400,0115)	1	Not Used
>Signature	(0400,0120)	1	Not Used
>Certified Timestamp Type	(0400,0305)	1C	Not Used
>Certified Timestamp	(0400,0310)	3	Not Used
>Digital Signature Purpose Code Sequence	(0400,0401)	3	Not Used
>>Include 'Code Sequence Macro'			
Encrypted Attributes Sequence	(0400,0500)	1C	Not Used
>Encrypted Content Transfer Syntax UID	(0400,0510)	1	Not Used
>Encrypted Content	(0400,0520)	1	Not Used
Original Attributes Sequence	(0400,0561)	3	Not Used
>Source of Previous Values	(0400,0564)	2	Not Used
>Attribute Modification DateTime	(0400,0562)	1	Not Used
>Modifying System	(0400,0563)	1	Not Used
>Reason for the Attribute Modification	(0400,0565)	1	Not Used
>Modified Attributes Sequence	(0400,0550)	1	Not Used
>>Any Attribute from the main data set that was modified or removed; may include Sequence Attributes and their Items.			
HL7 Structured Document Reference Sequence	(0040,A390)	1C	Not Used

>Referenced SOP Class UID	(0008,1150)	1	Not Used
>Referenced SOP Instance UID	(0008,1155)	1	Not Used
>HL7 Instance Identifier	(0040,E001)	1	Not Used
>Retrieve URI	(0040,E010)	3	Not Used
Longitudinal Temporal Information Modified	(0028,0303)	3	Used. If Include Remove Patient Information then fix to "MODIFIED".

4.5 STANDARD EXTENDED AND PRIVATE DATA ATTRIBUTES

Not applicable.

4.5.1 Standard Attributes

Not applicable.

4.6 STANDARD EXTENDED AND PRIVATE CONTEXT GROUPS

Not applicable.

5. X-RAY RADIATION DOSE STRUCTURED REPORT INFORMATION OBJECT IMPLEMENTATION

5.1 INTRODUCTION

This section specifies the use of the DICOM X-Ray Radiation Dose SR IOD to represent results produced and/or received by this implementation. Corresponding attributes are conveyed using the module construct.

5.2 WORKSTATION MAPPING OF DICOM ENTITIES

The Workstation maps DICOM Information Entities to local Information Entities in the product's database and user interface.

TABLE 5-1
MAPPING OF DICOM ENTITIES TO WORKSTATION ENTITIES

DICOM IE	Workstation Entity
Patient	Patient
Study	Exam
Series	Series
Equipment	Equipment
Document	Document

5.3 IOD MODULE TABLE

The X-Ray Radiation Dose Structured Report Information Object Definitions comprise the modules of the following tables, plus Standard Extended and Private Attributes. Standard Extended and Private Attributes are described in Section 5.5

The contents of the SR Document Content are constrained by the supported template, as identified in Section 5.4.5.2.1.1. Standard, Standard Extended and Private Templates are further described in Section 5.7.

TABLE 5-2
STRUCTURE REPORT IOD MODULES

Entity Name	Module Name	Usage	Reference
Patient	Patient	Used	5.4.1.1
	Specimen Identification	Not Used	N/A
	Clinical Trial Subject	Not Used	N/A
Study	General Study	Used	5.4.2.1
	Patient Study	Used	5.4.2.2
	Clinical Trial Study	Not Used	N/A
Series	SR Document Series	Used	5.4.3.1
	Clinical Trial Series	Not Used	N/A

Frame Of Reference	Synchronization	Not Used	N/A
Equipment	General Equipment	Used	5.4.4.1
	Enhanced General Equipment	Used	5.4.4.2
Document	SR Document General	Used	5.4.5.1
	SR Document Content	Used	5.4.5.2
	SOP Common	Used	5.4.5.3

5.4 INFORMATION MODULE DEFINITIONS

Please refer to DICOM Part 3 (Information Object Definitions) for a description of each of the entities, modules, and attributes contained within the SR Information Objects.

The following modules are included to convey Enumerated Values, Defined Terms, and Optional Attributes supported and/or expected. Type 1 & Type 2 Attributes are also included for completeness and to define what values they may take and where these values are obtained from when generating the instance as well as what are the expected values when loading such instance. It should be noted that they are the same ones as defined in the DICOM Standard Part 3 (Information Object Definitions). Also note that Attributes not present in tables are not supported.

5.4.1 Patient Entity Modules

5.4.1.1 Patient Module

TABLE 5-3
PATIENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	May be entered from user interface or got from Worklist. Supports 5 different components delimited by "^". Supports a maximum length of 64 bytes including the delimiter.
Patient ID	(0010,0020)	2	May be entered from user interface or got from Worklist. Truncated to 64 bytes, end truncated.
Issuer of Patient ID	(0010,0021)	3	Got from Worklist. Truncated to 64 bytes, end truncated.
Patient's Birth Date	(0010,0030)	2	May be entered from user interface or got from Worklist Truncated to 8 bytes, end truncated
Patient's Sex	(0010,0040)	2	May be entered from user interface or got from Worklist. Truncated to 2 bytes, end truncated
Referenced Patient Sequence	(0008,1120)	3	Not Used
>Include 'SOP Instance Reference Macro'			
Patient's Birth Time	(0010,0032)	3	Not Used

Other Patient IDs	(0010,1000)	3	Not Used
Other Patient IDs Sequence	(0010,1002)	3	Not Used
>Patient ID	(0010,0020)	1	Not Used
>Issuer of Patient ID	(0010,0021)	1	Not Used
>Type of Patient ID	(0010,0022)	1	Not Used
Other Patient Names	(0010,1001)	3	Not Used
Ethnic Group	(0010,2160)	3	Not Used
Patient Comments	(0010,4000)	3	May be entered from user interface or got from Worklist From user interface truncated to 512 bytes. From worklist truncated to 10240 bytes.
Patient Species Description	(0010,2201)	1C	Not Used
Patient Species Code Sequence	(0010,2202)	1C	Not Used
>Include 'Code Sequence Macro'			
Patient Breed Description	(0010,2292)	2C	Not Used
Patient Breed Code Sequence	(0010,2293)	2C	Not Used
>Include 'Code Sequence Macro'			
Breed Registration Sequence	(0010,2294)	2C	Not Used
>Breed Registration Number	(0010,2295)	1	Not Used
>Breed Registry Code Sequence	(0010,2296)	1	Not Used
>>Include 'Code Sequence Macro'			
Responsible Person	(0010,2297)	2C	Not Used
Responsible Person Role	(0010,2298)	1C	Not Used
Responsible Organization	(0010,2299)	2C	Not Used
Patient Identity Removed	(0012,0062)	3	Used. If Patient Information is removed then set to "YES", otherwise set to "NO"
De-identification Method	(0012,0063)	1C	Used. If Patient Information is removed. Set to "Limited Data Set" in this case
De-identification Method Code Sequence	(0012,0064)	1C	Not Used
>Include 'Code Sequence Macro'			

5.4.2 Study Entity Modules

5.4.2.1 General Study Module

TABLE 5-4
GENERAL STUDY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Study Instance UID	(0020,000D)	1	The product will adopt the Study Instance UID which is returned in the MWL response. If there is no Study Instance UID returned from MWL server, then new Study Instance UID will be created.

Study Date	(0008,0020)	2	This value is set to the exam created date.
Study Time	(0008,0030)	2	This value is set to the exam created time.
Referring Physician's Name	(0008,0090)	2	Got from Worklist.
Referring Physician Identification Sequence	(0008,0096)	3	Not Used
>Include 'Person Identification Macro'			
Study ID	(0020,0010)	2	Got from Worklist or generated by equipment.
Accession Number	(0008,0050)	2	May be entered from the user interface or got from Worklist.
Study Description	(0008,1030)	3	May be entered from the user interface or got from Worklist. The default value will be set as Requested Procedure Description when the tag got from MWL is not empty. Else this value will be set as Procedure Description on user interface.
Physician(s) of Record	(0008,1048)	3	Not Used
Physician(s) of Record Identification Sequence	(0008,1049)	3	Not Used
>Include 'Person Identification Macro'			
Name of Physician(s) Reading Study	(0008,1060)	3	Not Used
Physician(s) Reading Study Identification Sequence	(0008,1062)	3	Not Used
>Include 'Person Identification Macro'			
Referenced Study Sequence	(0008,1110)	3	Got from Worklist.
>Include 'SOP Instance Reference Macro'			
Procedure Code Sequence	(0008,1032)	3	Got from Worklist, else set as empty.
>Include 'Code Sequence Macro'			

5.4.2.2 Patient Study Module

TABLE 5-5
PATIENT STUDY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Admitting Diagnoses Description	(0008,1080)	3	Not Used
Admitting Diagnoses Code Sequence	(0008,1084)	3	Not Used
>Include 'Code Sequence Macro'			
Patient's Age	(0010,1010)	3	Not Used
Patient's Size	(0010,1020)	3	May be entered from the user interface or got from Worklist.
Patient's Weight	(0010,1030)	3	May be entered from the user interface or got from Worklist.
Occupation	(0010,2180)	3	Not Used
Additional Patient's History	(0010,21B0)	3	Not Used

Admission ID	(0038,0010)	3	Not Used
Service Episode ID	(0038,0060)	3	Not Used
Service Episode Description	(0038,0062)	3	Not Used
Patient's Sex Neutered	(0010,2203)	2C	Not Used

5.4.3 Series Entity Modules

5.4.3.1 SR Document Series Module

TABLE 5-6
SR DOCUMENT SERIES MODULE ATTRIBUTES

Attribute Name	Tag	Type	Use
Modality	(0008,0060)	1	Value = SR
Series Instance UID	(0020,000E)	1	Created by equipment, using prefix: 1.2.840.113619.2.320.+MAC+seriesIndicator(21)+TimeStamp_Exam MAC: Number string of device MAC address.
Series Number	(0020,0011)	1	A number that identifies this Series. This number will be set to 1 for image series and set to 2 for RDSR series
Series Date	(0008,0021)	3	First shot date.
Series Time	(0008,0031)	3	First shot time.
Series Description	(0008,103E)	3	The value equal protocol Name.
Referenced Performed Procedure Step Sequence	(0008,1111)	2	Always send. Referenced SOP Class UID = MPPS SOP Class UID. Referenced SOP Instance UID = MPPS SOP Instance UID.
> 'Referenced SOP Class / Instance UIDs'			

5.4.4 Equipment Entity Modules

5.4.4.1 General Equipment Module

TABLE 5-7
GENERAL EQUIPMENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	2	This value is set to "GE Hualun Medical Systems, Co. Ltd".
Institution Name	(0008,0080)	3	Configurable by user on setup screen (The field name is "Hospital Name").
Institution Address	(0008,0081)	3	Not Used
Station Name	(0008,1010)	3	Configurable by user on DICOM setup screen.
Institutional Department Name	(0008,1040)	3	Not Used
Manufacturer's Model Name	(0008,1090)	3	This value is set to type and model of the system: "OEC One ASD".
Device Serial Number	(0018,1000)	3	Configurable during system installation.

Software Versions	(0018,1020)	3	This value is set to workstation software version.
Gantry ID	(0018,1008)	3	Not Used
Spatial Resolution	(0018,1050)	3	Not Used
Date of Last Calibration	(0018,1200)	3	Not Used
Time of Last Calibration	(0018,1201)	3	Not Used
Pixel Padding Value	(0028,0120)	1C	Not Used

5.4.4.2 Enhanced General Equipment Module

TABLE 5-8
ENHANCED GENERAL EQUIPMENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	1	This value is set to "GE Hualun Medical Systems, Co. Ltd".
Manufacturer's Model Name	(0008,1090)	1	This value is set to type and model of the system: "OEC One ASD".
Device Serial Number	(0018,1000)	1	Configurable during system installation.
Software Versions	(0018,1020)	1	This value is set to workstation software version.

5.4.5 Document Entity Modules

5.4.5.1 SR Document General Module

TABLE 5-9
SR DOCUMENT GENERAL MODULE ATTRIBUTES

Attribute Name	Tag	Type	Use
Instance Number	(0020,0013)	1	Value is 1.
Completion Flag	(0040,A491)	1	COMPLETE
Completion Flag Description	(0040,A492)	3	Not Used
Verification Flag	(0040,A493)	1	UNVERIFIED
Content Date	(0008,0023)	1	First shot date.
Content Time	(0008,0033)	1	First shot time.
Verifying Observer Sequence	(0040,A073)	1C	Not Used.
>Verifying Observer Name	(0040,A075)	1	Not Used
>Verifying Observer Identification Code Sequence	(0040,A088)	2	Not Used
>>Include 'Code Sequence Macro'			
>Verifying Organization	(0040,A027)	1	Not Used
>Verification DateTime	(0040,A030)	1	Not Used
Author Observer Sequence	(0040,A078)	3	Used
>Include 'Identified Person or Device Macro'			
Participant Sequence	(0040,A07A)	3	Not Used
>Participation Type	(0040,A080)	1	Not Used

>Participation DateTime	(0040,A082)	2	Not Used
>Include 'Identified Person or Device Macro'			
Custodial Organization Sequence	(0040,A07C)	3	Not Used
>Institution Name	(0008,0080)	2	Not Used
>Institution Code Sequence	(0008,0082)	2	Not Used
>>Include 'Code Sequence Macro'			
Predecessor Documents Sequence	(0040,A360)	1C	Not Used
>Include 'Hierarchical SOP Instance Reference Macro'			
Identical Documents Sequence	(0040,A525)	1C	Not Used
>Include 'Hierarchical SOP Instance Reference Macro'			
Referenced Request Sequence	(0040,A370)	1C	Used
>Study Instance UID	(0020,000D)	1	The product will adopt the Study Instance UID which is returned in the MWL response. If there is no Study Instance UID returned from MWL server, then new Study Instance UID will be created by system during exam creation.
>Referenced Study Sequence	(0008,1110)	2	Set as empty
>>Include 'SOP Instance Reference Macro'			
>Accession Number	(0008,0050)	2	The product will adopt the Accession Number which is returned in the MWL response. If there is no Accession Number returned from MWL server, then the value will keep empty. For local created exam, user could input value from screen during exam creation.
>Placer Order Number/Imaging Service Request	(0040,2016)	2	Value is empty.
>Filler Order Number/Imaging Service Request	(0040,2017)	2	Value is empty.
>Requested Procedure ID	(0040,1001)	2	This value could got from MWL response, or the user can enter from the user interface.
>Requested Procedure Description	(0032,1060)	2	This value could got from MWL response, or the user can enter from the user interface.
>Requested Procedure Code Sequence	(0032,1064)	2	Sequence set with values from the MWL. No user input is used.
>>Include 'Code Sequence Macro'			
>Reason for the Requested Procedure	(0040,1002)	3	Not Used
>Reason for Requested Procedure Code Sequence	(0040,100A)	3	Not Used
>>Include 'Code Sequence Macro'			
Performed Procedure Code Sequence	(0040,A372)	2	Empty.
>Include Code Sequence Macro			
Current Requested Procedure Evidence Sequence	(0040,A375)	1C	With the value(s) from the system of all saved images for the exam. This is the list of all images whether they have been stored to PACS or not.

>Include 'Hierarchical SOP Instance Reference Macro'			
Pertinent Other Evidence Sequence	(0040,A385)	1C	Not Used
> Include 'Hierarchical SOP Instance Reference Macro'			
Referenced Instance Sequence	(0008,114A)	1C	Not Used
>Include 'SOP Instance Reference Macro'			
>Purpose of Reference Code Sequence	(0040,A170)	1	Not Used
>>Include 'Code Sequence Macro'			

5.4.5.2 SR Document Content Module

TABLE 5-10
SR DOCUMENT CONTENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Use
Observation DateTime	(0040,A032)	1C	Not Used
Content Template Sequence	(0040,A504)	1C	Used
>Mapping Resource	(0008,0105)	1	Value is DCMR
>Template Identifier	(0040,DB00)	1	Value is 10001
Value Type	(0040,A040)	1	CONTAINER
Continuity of Content	(0040,A050)	1C	SEPARATE
Concept Name Code Sequence	(0040,A043)	1C	Used
>Include 'Code Sequence Macro'			
Insert Concept Value attribute(s)		(113701,DCM, X-Ray Radiation Dose Report)	
Content Sequence	(0040,A730)	1C	Used
> Relationship Type	(0040,A010)	1	HAS CONCEPT MOD
> Referenced Content Item Identifier	(0040,DB73)	1C	Not Used
> Insert SR DocumentContent Module			Recursive inclusion to create document content tree. See section 5.4.5.2.1 for the list of supported templates

5.4.5.2.1 SR Document Content Descriptions

5.4.5.2.1.1 Content Template

The Workstation supports the following root Templates for SR SOP Instances created, processed, or displayed by the product.

TABLE 5-11
SR ROOT TEMPLATES

SOP Class	Template ID	Template Name	Use
X-Ray Radiation Dose SR	10001	X-Ray Radiation Dose	Create/Display

Refer to Section 5.7 for a detailed description of the supported templates.

5.4.5.3 SOP Common Module

TABLE 5-12
SOP COMMON MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	1	SOP Class UID for the Class that the dataset contains, just RDSR UID.
SOP Instance UID	(0008,0018)	1	Created by equipment, using prefix: 1.2.840.113619.2.320.+MAC+ srIndicator (50)+TimeStamp_Exam MAC: Number string of device MAC address.
Specific Character Set	(0008,0005)	1C	Always set to ISO_IR 100(= Latin Alphabet No. 1)
Instance Creation Date	(0008,0012)	3	Used
Instance Creation Time	(0008,0013)	3	Used
Instance Creator UID	(0008,0014)	3	Used
Related General SOP Class UID	(0008,001A)	3	Not Used
Original Specialized SOP Class UID	(0008,001B)	3	Not Used
Coding Scheme Identification Sequence	(0008,0110)	3	Not Used
>Coding Scheme Designator	(0008,0102)	1	Not Used
>Coding Scheme Registry	(0008,0112)	1C	Not Used
>Coding Scheme UID	(0008,010C)	1C	Not Used
>Coding Scheme External ID	(0008,0114)	2C	Not Used
>Coding Scheme Name	(0008,0115)	3	Not Used
>Coding Scheme Version	(0008,0103)	3	Not Used
>Coding Scheme Responsible Organization	(0008,0116)	3	Not Used
Timezone Offset From UTC	(0008,0201)	3	Not Used
Contributing Equipment Sequence	(0018,A001)	3	Not Used
>Purpose of Reference Code Sequence	(0040,A170)	1	Not Used
>>Include 'Code Sequence Macro'			
>Manufacturer	(0008,0070)	1	Not Used
>Institution Name	(0008,0080)	3	Not Used
>Institution Address	(0008,0081)	3	Not Used
>Station Name	(0008,1010)	3	Not Used
>Institutional Department Name	(0008,1040)	3	Not Used
>Manufacturer's Model Name	(0008,1090)	3	Not Used
>Device Serial Number	(0018,1000)	3	Not Used
>Software Versions	(0018,1020)	3	Not Used
>Spatial Resolution	(0018,1050)	3	Not Used
>Date of Last Calibration	(0018,1200)	3	Not Used
>Time of Last Calibration	(0018,1201)	3	Not Used

>Contribution DateTime	(0018,A002)	3	Not Used
>Contribution Description	(0018,A003)	3	Not Used
Instance Number	(0020,0013)	3	Instance number.
SOP Instance Status	(0100,0410)	3	Not Used
SOP Authorization Date and Time	(0100,0420)	3	Not Used
SOP Authorization Comment	(0100,0424)	3	Not Used
Authorization Equipment Certification Number	(0100,0426)	3	Not Used
MAC Parameters Sequence	(4FFE,0001)	3	Not Used
>MAC ID Number	(0400,0005)	1	Not Used
>MAC Calculation Transfer Syntax UID	(0400,0010)	1	Not Used
>MAC Algorithm	(0400,0015)	1	Not Used
>Data Elements Signed	(0400,0020)	1	Not Used
Digital Signatures Sequence	(FFFA,FFFA)	3	Not Used
>MAC ID Number	(0400,0005)	1	Not Used
>Digital Signature UID	(0400,0100)	1	Not Used
>Digital Signature DateTime	(0400,0105)	1	Not Used
>Certificate Type	(0400,0110)	1	Not Used
>Certificate of Signer	(0400,0115)	1	Not Used
>Signature	(0400,0120)	1	Not Used
>Certified Timestamp Type	(0400,0305)	1C	Not Used
>Certified Timestamp	(0400,0310)	3	Not Used
>Digital Signature Purpose Code Sequence	(0400,0401)	3	Not Used
>>Include 'Code Sequence Macro'			
Encrypted Attributes Sequence	(0400,0500)	1C	Not Used
>Encrypted Content Transfer Syntax UID	(0400,0510)	1	Not Used
>Encrypted Content	(0400,0520)	1	Not Used
Original Attributes Sequence	(0400,0561)	3	Not Used
>Source of Previous Values	(0400,0564)	2	Not Used
>Attribute Modification DateTime	(0400,0562)	1	Not Used
>Modifying System	(0400,0563)	1	Not Used
>Reason for the Attribute Modification	(0400,0565)	1	Not Used
>Modified Attributes Sequence	(0400,0550)	1	Not Used
>>Any Attribute from the main data set that was modified or removed; may include Sequence Attributes and their Items.			
HL7 Structured Document Reference Sequence	(0040,A390)	1C	Not Used
>Referenced SOP Class UID	(0008,1150)	1	Not Used
>Referenced SOP Instance UID	(0008,1155)	1	Not Used

>HL7 Instance Identifier	(0040,E001)	1	Not Used
>Retrieve URI	(0040,E010)	3	Not Used
Longitudinal Temporal Information Modified	(0028,0303)	3	Used. If Include Remove Patient Information then fix to "MODIFIED".

5.5 STANDARD EXTENDED AND PRIVATE DATA ATTRIBUTES

Not applicable.

5.6 STANDARD EXTENDED AND PRIVATE CONTEXT GROUPS

The Workstation supports coded terminology using Standard Extended, Private, and Configurable Context Groups defined in the following sections.

5.6.1 Standard Extended Context Groups

The Workstation supports the following extensions to standard Context Groups for SR SOP Instances created by this product. Extensions are indicated by **bold text.**

5.6.2 Configurable Context Groups

The Workstation supports the following Configurable Context Groups for SR SOP Instances created by this product.

Context Group	Default Value Set	Use
N/A	N/A	N/A

5.7 STANDARD, STANDARD EXTENDED AND PRIVATE TEMPLATES

The Workstation supports the Standard Extended and Private Templates defined in the following sections.

5.7.1 Standard Templates

The Workstation supports the following standard templates for SOP Instances created by this product.

5.7.1.1 Template ID 10001 X-Ray Radiation Dose

TID 10001
PROJECTION X-RAY RADIATION DOSE
Type: Extensible Order: Significant

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (113701, DCM, "X-Ray Radiation Dose Report")	1	M		Root Node
2	>	HAS CONCEPT MOD	CODE	EV (121058, DCM, "Procedure reported")	1	M		DT (113704, DCM, "Projection X-Ray")

3	>>	HAS CONCEPT MOD	CODE	EV (G-C0E8, SRT, "Has Intent")	1	M		(R-408C3,SRT,Diagnostic Intent)
4	>	CONTAINS	CODE	EV (122142, DCM, "Acquisition Device Type")	1	U		(DCM, 113957, Fluoroscopy-Guided Projection Radiography System)
5	>		INCLUDE	DTID (1002) Observer Context	1-n	M		
6	>	HAS OBS CONTEXT	CODE	EV (113705, DCM, "Scope of Accumulation")	1	M		(113016, DCM, "Performed Procedure Step").
7	>>	HAS PROPERTIES	UIDREF	DCID (10001) UID Types	1	M		(121126, DCM, "Performed Procedure Step SOP Instance UID")
8	>	CONTAINS	CODE	EV (113945, DCM, "X-Ray Detector Data Available")	1	U	DCID 230 "Yes-No"	(SRT, R-0038D, Yes)
9	>	CONTAINS	CODE	EV (113943, DCM, "X-Ray Source Data Available")	1	U	DCID 230 "Yes-No"	(SRT, R-0038D, Yes)
10	>	CONTAINS	CODE	EV (113944, DCM, "X-Ray Mechanical Data Available")	1	U	DCID 230 "Yes-No"	(SRT, R-00339, No)
11	>	CONTAINS	INCLUDE	DTID (10002) Accumulated X-Ray Dose	1	MC	IFF Single Plane system	$Plane = EV (113622, DCM, "Single Plane"
12	>	CONTAINS	INCLUDE	DTID (10002) Accumulated X-Ray Dose	1	MC	IFF Biplane system	Not Used
13	>	CONTAINS	INCLUDE	DTID (10002) Accumulated X-Ray Dose	1	MC	IFF Biplane system	Not Used
14	>	CONTAINS	INCLUDE	DTID (10003) Irradiation Event X-Ray Data	1-n	M	IF any of the values of TID(10001) Row 18 are not (113858, DCM, "MPPS Content"), (113866, DCM, "Copied From Image Attributes") or (113867, DCM, "Computed From Image Attributes")	Used
15	>	CONTAINS	TEXT	EV (121106, DCM, "Comment")	1	U		Patient Comment
16	>	CONTAINS	IMAGE	EV (121342, DCM, "Dose Image")	1-n	U		Not Used
17	>	CONTAINS	INCLUDE	DTID (1020) Person Participant	1	U		Not Used

18	>	CONTAINS	CODE	EV (113854, DCM, "Source of Dose Information")	1-n	M		(113856, DCM, "Automated Data Collection")

5.7.1.2 Template ID 10002 Accumulated X-Ray Dose

TID 10002
ACCUMULATED X-RAY DOSE
Type: Extensible Order: Significant

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (113702, DCM, "Accumulated X-Ray Dose Data")	1	M		
2	>	HAS CONCEPT MOD	CODE	EV (113764, DCM, "Acquisition Plane"	1	M		(113622,DCM, "Single Plane")
3	>	CONTAINS	CONTAINER	EV (122505, DCM, "Calibration")	1-n	MC	IFF Calibration Data is available	
4	>>	HAS CONCEPT MOD	CODE	EV (113794, DCM, "Dose Measurement Device")	1	M		(A-2C090, SRT, "Dosimeter")
5	>>	CONTAINS	DATETIME	EV (113723, DCM, "Calibration Date")	1	M		The date of DAP Calibration performed.
6	>>	CONTAINS	NUM	EV (122322, DCM, "Calibration Factor")	1	M		Units = EV (1, UCUM, "no units") From QC user interface otherwise default value is 1.0.
7	>>	CONTAINS	NUM	EV (113763, DCM, "Calibration Uncertainty")	1	M		Units = EV (%, UCUM, "Percent") From QC user interface otherwise default value is 25.
8	>>	CONTAINS	TEXT	EV (113724, DCM, "Calibration Responsible Party")	1	M		From QC user interface otherwise default value is GE.
9	>>	CONTAINS	TEXT	EV (113720, DCM, "Calibration Protocol")	1	U		From QC user interface otherwise default value is empty.
10	>	CONTAINS	INCLUDE	DTID 10004 "Accumulated Fluoroscopy and Acquisition Projection X-Ray Dose"	1	MC	IFF TID (10001) Row 4 = (113957, DCM, "Fluoroscopy-Guided Projection Radiography System") or TID (10001) Row 2 = (113704, DCM, "Projection X-Ray") and TID (10001) Row 4 is absent)	Used

11	>	CONTAINS	INCLUDE	DTID 10005 "Accumulated Mammography X-Ray Dose"	1	MC	IFF TID (10001) Row 2 = (P5-40010, SRT, "Mammography")	Not Used
12	>	CONTAINS	INCLUDE	DTID 10007 "Accumulated Total Projection Radiography Dose"	1	MC	IFF TID (10001) Row 4 = (113958, DCM, "Integrated Projection Radiography System") or TID (10001) Row 4 = (113957, DCM, "Fluoroscopy-Guided Projection Radiography System") or TID (10001) Row 2 = (113704, DCM, "Projection X-Ray") and TID (10001) Row 4 is absent)	Used
13	>	CONTAINS	INCLUDE	DTID 10006 "Accumulated Cassette-based Projection Radiography Dose"	1	MC	IFF TID (10001) Row 4 = (113959, DCM, "Cassette-based Projection Radiography System")	Not Used
14	>	CONTAINS	INCLUDE	DTID (1021) Device Participant	1	MC	Required if the irradiating device is not the recording device and the dose was accumulated on a single device.	Not Used

5.7.1.3 Template ID 10003 Irradiation Event X-Ray Data

TID 10003
IRRADIATION EVENT X-RAY DATA
Type: Extensible Order: Significant

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (113706, DCM, "Irradiation Event X-Ray Data")	1	M		
2	>	HAS CONCEPT MOD	CODE	EV (113764, DCM, "Acquisition Plane")	1	M		(113622, DCM, "Single Plane")
3	>	CONTAINS	UIDREF	EV (113769, DCM, "Irradiation Event UID")	1	M		The UID value of the irradiation event from the system.

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
4	>	CONTAINS	TEXT	EV (113605, DCM, "Irradiation Event Label")	1	U		Value is shot number.
5	>>	HAS CONCEPT MOD	CODE	EV (113606, DCM, "Label Type")	1	MC	IF the value of Row 4 is the value of an Attribute in the images.	(DCM, 113608, Acquisition Number)
6	>	CONTAINS	DATETIME	DT (111526, DCM, "DateTime Started")	1	M		Date and time of each shot
7	>	CONTAINS	CODE	EV (113721, DCM, "Irradiation Event Type")	1	M		(P5-06000, SRT, "Fluoroscopy").
8	>	CONTAINS	TEXT	EV (125203, DCM, "Acquisition Protocol")	1	U		The text value of the IOD tag (0018,1030) Protocol Name from the system.
9	>	CONTAINS	CODE	EV (T-D0005, SRT, "Anatomical structure")	1	U		Not Used
10	>>	HAS CONCEPT MOD	CODE	EV (G-C171, SRT, "Laterality")	1	UC	If anatomy is bi-lateral	Not Used
11	>	CONTAINS	CODE	EV (111031, DCM, "Image View")	1	U		Not Used
12	>>	HAS CONCEPT MOD	CODE	EV (111032, DCM, "Image View Modifier")	1-n	U		Not Used
13	>>	CONTAINS	CODE	EV (113946, DCM, "Projection Eponymous Name")	1	U		Not Used
14	>	CONTAINS	CODE	EV (113745, DCM, "Patient Table Relationship")	1	U		Not Used
15	>	CONTAINS	CODE	EV (113743, DCM, "Patient Orientation")	1	U		Not Used
16	>>	HAS CONCEPT MOD	CODE	EV (113744, DCM, "Patient Orientation	1	M		Not Used

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
				Modifier")				
17	>	CONTAINS	CODE	EV (123014, DCM, "Target Region")	1	M		1. The code from the system using DICOM Part 16 Context ID 4031 values and supporting the code (T-D0001, SRT, "Topography unknown") for an 'Unknown' value which is SNOMED term. 2. User could set this value in EM->Additional Screen. Default is (T-D0001, SRT, "Topography unknown")
18	>	CONTAINS	NUM	EV (122130, DCM, "Dose Area Product")	1	MC	IFF TID (10001) Row 2 = (113704, DCM, "Projection X-Ray")	UNITS = EV (Gy.m2, UCUM, "Gy.m2")
19	>	CONTAINS	NUM	EV (111634, DCM, "Half Value Layer")	1	U		Not Used
20	>	CONTAINS	NUM	EV (111638, DCM, "Patient Equivalent Thickness")	1	U		Not Used
21	>	CONTAINS	NUM	EV (111636, DCM, "Entrance Exposure at RP")	1	MC	IF TID (10001) Row 2 = (P5-40010, SRT, "Mammography") and (TID (10001) Row 9 is absent or value is (R-0038D, SRT, "Yes")) and (TID (10001) Row 10 is absent or value is (R-0038D, SRT, "Yes"))	Not Used
22	>	CONTAINS	TEXT	EV (113780, DCM, "Reference Point Definition")	1	MC	IF Row 21 is present and Row 23 is not present	Not Used
23	>	CONTAINS	CODE	EV (113780, DCM, "Reference Point Definition")	1	MC	IF Row 21 is present and Row 22 is not present	The value of code (113861, DCM, "15cm in Front of Image Input Surface).
24	>	CONTAINS	INCLUDE	DTID 4007 “Mammography CAD Breast Composition”	1	U		Not Used

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
25	>	CONTAINS	TEXT	EV (121106, DCM, "Comment")	1	U		Patient Comment
26	>	CONTAINS	INCLUDE	DTID 1020 “Person Participant”	1-n	U		Not Used
27	>	CONTAINS	INCLUDE	DTID 10003A “Irradiation Event X-Ray Detector Data”	1	MC	IFF TID (10001) Row 8 is absent or has a value of (R-0038D, SRT, "Yes")	Used
28	>	CONTAINS	INCLUDE	DTID 10003B “Irradiation Event X-Ray Source Data”	1	MC	IFF TID (10001) Row 9 is absent or has a value of (R-0038D, SRT, "Yes")	Used
29	>	CONTAINS	INCLUDE	DTID 10003C “Irradiation Event X-Ray Mechanical Data”	1	MC	IFF TID (10001) Row 10 is absent or has a value of (R-0038D, SRT, "Yes")	Not Used

5.7.1.4 TID 10003A Irradiation Event X-Ray Detector Data

TID 10003A
Irradiation Event X-Ray Detector Data
Type: Extensible Order: Non-Significant

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			NUM	EV (113845, DCM, "Exposure Index")	1	MC	IF the value is displayable to the X-Ray system operator.	Not Used
2			NUM	EV (113846, DCM, "Target Exposure Index")	1	MC	IF the value is displayable to the X-Ray system operator.	Not Used
3			NUM	EV (113847, DCM, "Deviation Index")	1	MC	IF the value is displayable to the X-Ray system operator.	Not Used
4			INCLUDE	DTID 1021 “Device Participant”	1	U		Not Used
5			IMAGE	EV (113795, DCM, "Acquired Image")	1-n	MC	IFF Image Object is created for this	All image UIDs.

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
							irradiation event	

5.7.1.5 TID 10003B Irradiation Event X-Ray Source Data

TID 10003B
Irradiation Event X-Ray Source Data
Type: Extensible Order: Non-Significant

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			NUM	EV (113738, DCM, "Dose (RP) ")	1	MC	IF TID (10001) Row 2 = (113704, DCM, "Projection X-Ray") AND any of the values of TID (10001) Row 18 are not (113858, DCM, "MPPS Content")	UNITS = EV (Gy, UCUM, "Gy") Dose applied at the Reference Point (RP)
2			TEXT	EV (113780, DCM, "Reference Point Definition")	1	MC	IF Row 1 is present and Row 3 is not present	Not Used
3			CODE	EV (113780, DCM, "Reference Point Definition")	1	MC	IF Row 1 is present and Row 2 is not present	The value of code (113861, DCM, "15cm in Front of Image Input Surface).
4			NUM	EV (111631, DCM, "Average Glandular Dose")	1	MC	IFF TID (10001) Row 2 = (P5-40010, SRT, "Mammography")	Not Used
5			CODE	EV (113732, DCM, "Fluoro Mode")	1	UC	IFF TID (10003) Row 7 value = (P5-06000, SRT, "Fluoroscopy")	1. (113630, DCM, "Continuous") for continuous mode irradiation events. 2. (113631, DCM, "Pulsed") for pulse mode irradiation events.
6			NUM	EV (113791, DCM, "Pulse Rate")	1	MC	IFF Row 5 value = (113631, DCM, "Pulsed")	Units = EV ({pulse}/s, UCUM, “pulse/s”) For Pulsed mode irradiation events.
7			NUM	EV (113768, DCM, "Number of Pulses")	1	MC	IFF Row 5 is not present or Row 5 is present and equals (113631, DCM, "Pulsed")	Units = EV (1, UCUM, “no units”) 1. For Pulsed mode irradiation events. 2. Estimated:

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
								a. Manual: exposure time/pulse width b. Auto: exposure time/pulse width (margin of error might be bigger than manual) c. Got pulse width value from configure file.
8	>	HAS CONCEPT MOD	CODE	EV (121401, DCM, "Derivation")	1	MC	IFF count of pulses in Row 7 is estimated	EV (R-10260, SRT, "Estimated")
9			NUM	EV (113793, DCM, "Pulse Width")	1-n	U		Units = EV (ms, UCUM, "ms") Got value from configure file if has pulsed mode.
10			NUM	EV (113742, DCM, "Irradiation Duration")	1	U		Not Used
11			NUM	EV (113733, DCM, "KVP")	1-n	M		UNITS = EV (kV, UCUM, "kV") For Continuous/Pulsed mode irradiation events.
12			NUM	EV (113734, DCM, "X-Ray Tube Current")	1-n	MC	IF Row 15 is not present	UNITS = EV (mA, UCUM, "mA")
13			NUM	EV (113767, DCM, "Average X-Ray Tube Current")	1	U		UNITS = EV (mA, UCUM, "mA") The same with above "X-Ray Tube Current"
14			NUM	EV (113824, DCM, "Exposure Time")	1	MC	IF Row 15 is not present	UNITS = EV (ms, UCUM, "ms")
15			NUM	EV (113736, DCM, "Exposure")	1-n	MC	IF Row 12 or 14 is not present	Not Used
16			NUM	EV (113766, DCM, "Focal Spot Size")	1	U		UNITS = EV (mm,UCUM, "mm")
17			CODE	EV (111632,	1	U		Not Used

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
				DCM, "Anode Target Material")				
18			CONTAINER	EV (113771, DCM, "X-Ray Filters")	1-n	U		Not Used
19	>	CONTAINS	CODE	EV (113772, DCM, "X-Ray Filter Type")	1	U		Not Used
20	>	CONTAINS	CODE	EV (113757, DCM, "X-Ray Filter Material")	1	U		Not Used
21	>	CONTAINS	NUM	EV (113758, DCM, "X-Ray Filter Thickness Minimum")	1	U		Not Used
22	>	CONTAINS	NUM	EV (113773, DCM, "X-Ray Filter Thickness Maximum")	1	U		Not Used
23			NUM	EV (113790, DCM, "Collimated Field Area")	1	U		Not Used
24			NUM	EV (113788, DCM, "Collimated Field Height")	1	U		Not Used
25			NUM	EV (113789, DCM, "Collimated Field Width")	1	U		Not Used
26			CODE	EV (111635, DCM, "X-Ray Grid")	1-n	U		Not Used
27			INCLUDE	DTID 1021 “Device Participant”	1	MC	Required if the irradiating device is not the recording device.	Not Used

5.7.1.6 Template ID 10004 Accumulated Projection X-Ray Dose

TID 10004
ACCUMULATED PROJECTION X-RAY DOSE
Type: Extensible Order: Significant

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			NUM	EV (113726, DCM, "Fluoro Dose Area Product Total")	1	MC	IFF TID (10003) Row 7 value = (P5-06000, SRT, "Fluoroscopy") for at least one irradiation event	UNITS = EV (Gy.m2, UCUM, "Gy.m2") The numeric value of Total Radioscopic Dose Area Product.
2			NUM	EV (113728, DCM, "Fluoro Dose (RP) Total")	1	MC	IFF TID (10003) Row 7 value = (P5-06000, SRT, "Fluoroscopy") for at least one irradiation event AND any of the values of TID (10001) Row 18 are not (113858, DCM, "MPPS Content").	UNITS = EV (Gy, UCUM, "Gy") The numeric value of Cumulative Radioscopic Air Kerma.
3			NUM	EV (113730, DCM, "Total Fluoro Time")	1	MC	IFF TID (10003) Row 7 value = (P5-06000, SRT, "Fluoroscopy") for at least one irradiation event.	UNITS = EV (s, UCUM, "s") The numeric value of Total Radioscopic time to the second.
4			NUM	EV (113727, DCM, "Acquisition Dose Area Product Total")	1	M		UNITS = EV (Gy.m2, UCUM, "Gy.m2") The numeric value of Total Radiographic Dose Area Product.
5			NUM	EV (113729, DCM, "Acquisition Dose (RP) Total")	1	MC	IF any of the values of TID (10001) Row 18 are not (113858, DCM, "MPPS Content"). May be present otherwise.	UNITS = EV (Gy, UCUM, "Gy") The numeric value of Cumulative Radiographic Air kerma.
6			NUM	EV (113855, DCM, "Total Acquisition Time")	1	M		UNITS = EV (s, UCUM, "s") The numeric value of Total Radiographic pedal time in milliseconds.

5.7.1.7 TID 10007 Accumulated Total Projection Radiography Dose

TID 10007
Accumulated Total Projection Radiography Dose
Type: Non-Extensible Order: Significant

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			NUM	EV (113722, DCM, "Dose Area Product Total")	1	M		UNITS = EV (Gy.m2, UCUM, "Gy.m2") The numeric value of Total Dose Area Product. (Radioscopic)
2			NUM	EV (113725, DCM, "Dose (RP) Total")	1	MC	IF TID (10001) Row 4 = (113958, DCM, "Integrated Projection Radiography System") or any of the values of TID (10001) Row 18 are not (113858, DCM, "MPPS Content").	UNITS = EV (Gy, UCUM, "Gy") The numeric value of Cumulative Air Kerma.(Radioscopic)
3			NUM	EV (113737, DCM, "Distance Source to Reference Point")	1	U		UNITS = EV (mm, UCUM, "mm") Got value from configure file.
4			NUM	EV (113731, DCM, "Total Number of Radiographic Frames")	1	U		UNITS = EV (1, UCUM, "no units") The numeric value of Total Film and Digital Spot Frames.
5			CODE	EV (113780, DCM, "Reference Point Definition")	1	MC	IF any of (113725, DCM, "Dose (RP) Total"), (113728, DCM, "Fluoro Dose (RP) Total") or (113729, DCM, "Acquisition Dose (RP) Total") are present, and Row 6 is not present.	(113861, DCM, "15cm in Front of Image Input Surface").
6			TEXT	EV (113780, DCM, "Reference Point Definition")	1	MC	IF any of (113725, DCM, "Dose (RP) Total"), (113728, DCM, "Fluoro Dose (RP) Total") or (113729, DCM,	Not Used

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
							"Acquisition Dose (RP) Total") are present, and Row 5 is not present.	

5.7.1.8 Template ID 1002 Person Observer Context

TID 1002
OBSERVER CONTEXT
Type: Non-Extensible Order: Significant

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		HAS OBS CONTEXT	CODE	EV (121005,DCM, "Observer Type")	1	MC	IF Observer type is device	(121006, DCM, "Person")
2		HAS OBS CONTEXT	INCLUDE	DTID (1003) Person observer identifying attributes	1	MC	IFF Row 1 value = (121006,DCM, "Person") or Row 1 is absent	Used
3		HAS OBS CONTEXT	INCLUDE	DTID (1004) Device observer identifying attributes	1	MC	IFF Row 1 value = (121007,DCM, "Device")	Not Used

5.7.1.9 Template ID 1002 Device Observer Context

TID 1002
OBSERVER CONTEXT
Type: Non-Extensible Order: Significant

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		HAS OBS CONTEXT	CODE	EV (121005,DCM, "Observer Type")	1	MC	IF Observer type is device	(121007, DCM, "Device")
2		HAS OBS CONTEXT	INCLUDE	DTID (1003) Person observer identifying attributes	1	MC	IFF Row 1 value = (121006,DCM, "Person") or Row 1 is absent	Not Used
3		HAS OBS CONTEXT	INCLUDE	DTID (1004) Device observer identifying attributes	1	MC	IFF Row 1 value = (121007,DCM, "Device")	Used

5.7.1.10 TID 1003 Person Observer Identifying Attributes

TID 1003
DEVICE OBSERVER IDENTIFYING ATTRIBUTES
Type: Extensible Order: Significant

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			PNAME	EV (121008, DCM, "Person Observer Name")	1	M		This value is set to the performing physician.

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
2			TEXT	EV (121009, DCM, "Person Observer's Organization Name")	1	U		Defaults to Institution Name (0008,0080) of the General Equipment Module.
3			CODE	EV (121010, DCM, "Person Observer's Role in the Organization")	1	U		("J-0016E","SRT","Medical Practitioner")
4			CODE	EV (121011, DCM, "Person Observer's Role in this Procedure")	1	U		("113851","DCM","Irradiation Administering")

5.7.1.11 Template ID 1004 Device Observer Identifying Attributes

TID 1004
DEVICE OBSERVER IDENTIFYING ATTRIBUTES
Type: Extensible Order: Significant

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			UIDREF	EV (121012,DCM, "Device Observer UID")	1	M		System Generated
2			TEXT	EV (121013,DCM, "Device Observer Name")	1	U		Defaults to value of Station Name (0008,1010) in General Equipment Module. If 'Station Name' is blank the value for Local AE Title shall be used.
3			TEXT	EV (121014,DCM, "Device Observer Manufacturer")	1	U		Defaults to value of Manufacturer (0008,0070) in General Equipment Module
4			TEXT	EV (121015,DCM, "Device Observer Model Name")	1	U		Defaults to value of Manufacturer's Model Name (0008,1090) in General Equipment Module
5			TEXT	EV (121016,DCM, "Device Observer Serial Number")	1	U		Defaults to value of Device Serial Number (0018,1000) in General Equipment Module
6			TEXT	EV (121017,DCM, "Device Observer Physical Location during observation")	1	U		Hospital Name.
7			CODE	EV (113876, DCM, "Device Role in Procedure")	1-n	U		(113859, DCM, "Irradiating Device")

5.7.2 Standard Extended Templates

The Workstation supports the following extensions or restrictions to standard templates for SOP Instances created by this product. Extensions or restrictions are indicated by **bold text.**

6. MODALITY WORKLIST QUERY IMPLEMENTATION

6.1 INTRODUCTION

This section specifies the use of the DICOM Modality Worklist Information Model used to organize data and against which a Modality Worklist Query will be performed.

6.2 WORKSTATION MAPPING OF DICOM ENTITIES

The Workstation maps DICOM Information Entities to local Information Entities in the product's database and user interface.

TABLE 6-1
MAPPING OF DICOM ENTITIES TO WORKSTATION ENTITIES

DICOM	Workstation Entity
Scheduled Procedure Step	Exam
Requested Procedure	Exam
Imaging Service Request	Exam
Visit	Not Applicable
Patient	Patient

6.3 WORKLIST QUERY MODULE TABLE

See DICOM PS 3.3 and PS 3.4 for a complete definition of the entities, modules, and attributes.

TABLE 6-2
MODALITY WORKLIST INFORMATION MODEL MODULES

Entity Name	Module Name	Reference
Scheduled Procedure Step	SOP Common	6.4.1.1
	Scheduled Procedure Step	6.4.1.2
Requested Procedure	Requested Procedure	6.4.2.1
Imaging Service Request	Imaging Service Request	6.4.3.1
Visit	Visit Identification	6.4.4.1
	Visit Status	6.4.4.2
	Visit Relationship	6.4.4.3
	Visit Admission	6.4.4.4
Patient	Patient Relationship	6.4.5.1
	Patient Identification	6.4.5.2
	Patient Demographic	6.4.5.3
	Patient Medical	6.4.5.4

6.4 WORKLIST QUERY MODULE DEFINITIONS

Please refer to DICOM Standard PS 3.3. (Information Object Definitions) for a description of each of the query key attributes contained within the Modality Worklist Information Model.

6.4.1 Common Scheduled Procedure Step Entity Modules

6.4.1.1 SOP Common Module

TABLE 6-3
SOP COMMON MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance / MPPS	Note
Specific Character Set	(0008,0005)	O	1C	Yes/Yes	See Section 6.4.1.1.1 below

6.4.1.1.1 Specific Character Set

The attribute Specific Character Set (0008,0005) will always be sent.

As a Query SCU, it will similarly accept response items with ISO_IR 100 values of Specific Character Set or empty value of Specific Character Set (absence of (0008,0005) which mean usage of ASCII Chars only).

The Workstation user interface will allow the user to enter characters from the console keyboard that is within ISO 8859-1 characters.

Please also refer to Section 2.7.

6.4.1.2 Scheduled Procedure Step Module

TABLE 6-4
SCHEDULED PROCEDURE STEP MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance / MPPS	Note
Scheduled Procedure Step Sequence	(0040,0100)	R	1	No/No	
>Scheduled Station AE Title	(0040,0001)	R	1	Yes/No	Matching is supported and is configured by the user interface.
>Scheduled Procedure Step Start Date	(0040,0002)	R	1	No/No	Using the date configured from the DICOM query filter screen, the following matching can be done: YYYY- year, MM- month, DD- day. Range matching can also be done YYYYMMDD-YYYYMMDD - all matches included between those dates. The "dash" is important -YYYYMMDD - all matches prior to and including this date. The beginning "dash" is important. YYYYMMDD- all matches after and including this date. The ending "dash" is important. Single matching where the dates entered is equal. The data entered on the user interface is passed to the Server as entered; if it does not work see the Server DICOM conformance statement.
>Scheduled Procedure Step Start Time	(0040,0003)	R	1	No/No	No Matching is performed.
>Modality	(0008,0060)	R	1	Yes/Yes	Matching is supported and is configured by the user interface. This value could be set to RF/XA/CR/OT/ALL. "ALL" means any modality. Note 1: Send the field as empty to request universal matching when "ALL" is selected from the UI. Note 2:User could only select RF,XA,CR or OT as Modality Type during image archiving.

>Scheduled Performing Physician's Name	(0040,0006)	R	2 *	Yes/Yes	Matching is performed. The data entered on the user interface is passed to the server as it is. Single matching is supported for this data element. This value is mapped into (0008, 1050) in the instance. This value is mapped into (0008, 1050) in the MPPS. Supports 5 different components delimited by "^". Supports a maximum length of 64 bytes including the delimiter.
>Scheduled Procedure Step Description	(0040,0007)	O	1C *	Yes/Yes	No Matching is performed. This value is mapped into (0040,0275)->(0040, 0007) & Protocol Name(0018,1030) & Series Description(0008,103E) in the image instance. This value is mapped into Series Description(0008,103E) & EV(125203, DCM, "Acquisition Protocol") in the RDSR instance. This value is mapped into (0040,0270)->(0040, 0007) & Protocol Name(0018,1030) & Series Description(0008,103E) in the MPPS.
>Scheduled Station Name	(0040,0010)	O	2	No/No	No Matching is performed.
>Scheduled Procedure Step Location	(0040,0011)	O	2	No/No	No Matching is performed.
>Scheduled Protocol Code Sequence	(0040,0008)	O	1C	Yes/Yes	No Matching is performed. This value is mapped into (0040,0275)-> (0040, 0008) in the instance. This value is mapped into (0040,0270)-> (0040, 0008) in the MPPS.
>>Code Value	(0008,0100)	O	1	Yes/Yes	No Matching is performed.
>>Coding Scheme Designator	(0008,0102)	O	1	Yes/Yes	No Matching is performed.
>>Coding Scheme Version	(0008,0103)	O	3	Yes/Yes	No Matching is performed.
>>Code Meaning	(0008,0104)	O	3 *	Yes/Yes	No Matching is performed.
>Pre-Medication	(0040,0012)	O	2C	No/No	No Matching is performed.
>Scheduled Procedure Step ID	(0040,0009)	O	1 *	Yes/Yes	No Matching is performed. This value is mapped into (0040,0275)-> (0040, 0009) in the instance. This value is mapped into (0040,0270)-> (0040, 0009) in the MPPS.
>Requested Contrast Agent	(0032,1070)	O	2C	Yes/No	No Matching is performed. This value is mapped into (0018, 0010) in the instance.
>Scheduled Procedure Step Status	(0040,0020)	O	3	No/No	Not Requested

>Comments on the Scheduled Procedure Step	(0040,0400)	O	3	No/No	Not Requested

Note: * in the *Expected Return Key Type* column indicates that this information is displayed on screen, if available.

6.4.2 Common Requested Procedure Entity Modules

6.4.2.1 Requested Procedure Module

TABLE 6-5
REQUESTED PROCEDURE MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance / MPPS	Note
Requested Procedure ID	(0040,1001)	O	1 *	Yes/Yes	Matching is performed. The data entered on the user interface is passed to the server as it is. Single matching is supported for this data element. This value is mapped into (0020,0010) in the instance and is displayed as the Study ID of the exam if a value is returned. This value is mapped into(0040,0275)->(0040,1001) in the image instance. This value is mapped into (0040,a370)->(0040, 1001) in the RDSR. This value is mapped into (0040,0270)->(0040, 1001) in the MPPS.
Requested Procedure Description	(0032,1060)	O	1C *	Yes/Yes	This value is mapped into (0040,0275)->(0032,1060) & Study Description(0008,1030) in the image instance. This value is mapped into (0040,A370)->(0032,1060) in the RDSR. This value is mapped into (0040,0270)->(0032, 1060) & Study Description(0008,1030) in the MPPS.
Requested Procedure Code Sequence	(0032,1064)	O	1C	Yes/Yes	No Matching is performed. This value is mapped into (0032, 1064) in the image instance. This value is mapped into (0032, 1064) in the RDSR. This value is mapped into (0008, 1032) in the MPPS.
>Code Value	(0008,0100)	O	1	Yes/Yes	No Matching is performed.
>Coding Scheme Designator	(0008,0102)	O	1	Yes/Yes	No Matching is performed.
>Coding Scheme Version	(0008,0103)	O	3	Yes/Yes	No Matching is performed.

>Code Meaning	(0008,0104)	O	3	Yes/Yes	No Matching is performed.
Study Instance UID	(0020,000D)	O	1	Yes/Yes	The product will adopt the Study Instance UID which is returned in the MWL response. If there is no Study Instance UID returned from MWL server, then new Study Instance UID will be system created.
Study Date	(0008,0020)	O	3	No/No	Not Requested
Study Time	(0008,0030)	O	3	No/No	Not Requested
Referenced Study Sequence	(0008,1110)	O	2	Yes/Yes	This value is mapped into (0008,1110) in the image instance. This value is mapped into (0008,1110) in the RDSR. This value is mapped into (0008, 1110) in the MPPS.
>Referenced SOP Class UID	(0008,1150)	O	1C	Yes/Yes	
>Referenced SOP Instance UID	(0008,1155)	O	1C	Yes/Yes	
Requested Procedure Priority	(0040,1003)	O	2	No/No	No Matching is performed.
Patient Transport Arrangements	(0040,1004)	O	2	No/No	Not Requested
Requested Procedure Location	(0040,1005)	O	3	No/No	Not Requested
Confidentiality Code	(0040,1008)	O	3	No/No	Not Requested
Reporting Priority	(0040,1009)	O	3	No/No	Not Requested
Names of Intended Recipients of Results	(0040,1010)	O	3	No/No	No Matching is performed.
Reason for the Requested Procedure	(0040,1002)	O	3	No/No	No Matching is performed.
Requested Procedure Comments	(0040,1400)	O	3	No/No	Not Requested

Note: * in the *Expected Return Key Type* column indicates that this information is displayed on screen, if available.

6.4.2.1.1 Study Instance UID

The Workstation will adopt the Study Instance UID which is returned in the MWL response. If there is no Study Instance UID returned from MWL server, then new Study Instance UID will be created.

6.4.3 Common Imaging Service Request Entity Modules

6.4.3.1 Imaging Service Request Module

TABLE 6-6
IMAGING SERVICE REQUEST MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance / MPPS	Note
Accession Number	(0008,0050)	O	2 *	Yes/Yes	Matching is performed. The data entered on the user interface is passed to the server as it is. Single matching is supported for this data element. Truncated to 16 bytes, end truncated This value is mapped into (0008,0050) in the instance or RDSR. This value is mapped into (0008, 0050) in the MPPS.
Requesting Physician	(0032,1032)	O	2	No/No	No Matching is performed.
Referring Physician's Name	(0008,0090)	O	2 *	Yes/No	No Matching is performed. This value is mapped into (0008,0090) in the instance or RDSR.
Requesting Service	(0032,1033)	O	3	No/No	Not Requested
Imaging Service Request Comments	(0040,2400)	O	3	No/No	Not Requested
Issue Date of Imaging Service Request	(0040,2004)	O	3	No/No	Not Requested
Issue Time of Imaging Service Request	(0040,2005)	O	3	No/No	Not Requested
Placer Order Number / Imaging Service Request	(0040,2016)	O	3	No/No	Not Requested
Filler Order Number / Imaging Service Request	(0040,2017)	O	3	No/No	Not Requested
Order entered by ...	(0040,2008)	O	3	No/No	Not Requested
Order Enterer's Location	(0040,2009)	O	3	No/No	Not Requested
Order Callback Phone Number	(0040,2010)	O	3	No/No	Not Requested

Note: * in the *Expected Return Key Type* column indicates that this information is displayed on screen, if available.

6.4.4 Common visit Entity Modules

6.4.4.1 Visit Identification

Not applicable.

6.4.4.2 Visit Status

Not applicable.

6.4.4.3 Visit Relationship

Not applicable.

6.4.4.4 Visit Admission

Not applicable.

6.4.5 Common Patient Entity Modules

6.4.5.1 Patient Relationship

Not applicable.

6.4.5.2 Patient Identification

TABLE 6-7
PATIENT IDENTIFICATION MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance / MPPS	Note
Patient's Name	(0010,0010)	R	1 *	Yes/Yes	Matching is performed. Single or Wildcard matching is supported for this data element. Supports 5 different components delimited by "^". Supports a maximum length of 64 bytes including the delimiter.
Patient ID	(0010,0020)	R	1 *	Yes/Yes	Matching is performed. Single matching is supported for this data element. Truncated to 64 bytes, end truncated
Issuer of Patient ID	(0010,0021)	O	3	Yes/Yes	No Matching is performed.
Other Patient IDs	(0010,1000)	O	3	No/No	Not Requested
Other Patient Names	(0010,1001)	O	3	No/No	Not Requested
Patient's Birth Name	(0010,1005)	O	3	No/No	Not Requested
Patient's Mother's Birth Name	(0010,1060)	O	3	No/No	Not Requested

Note: * in the *Expected Return Key Type* column indicates that this information is displayed on screen, if available.

6.4.5.3 Patient Demographic

TABLE 6-8
PATIENT DEMOGRAPHIC MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance / MPPS	Note
Patients Birth Date	(0010,0030)	O	2 *	Yes/Yes	No Matching is performed.. Truncated to 64 bytes, end truncated.
Patient's Sex	(0010,0040)	O	2 *	Yes/Yes	No Matching is performed. Truncated to 2 bytes, end truncated
Patient's Weight	(0010,1030)	O	2*	Yes/No	No Matching is performed. Mapped into image and RDSR instance. Truncated to 16 bytes, end truncated
Confidentiality constraint on patient data	(0040,3001)	O	2	No/No	No Matching is performed.
Patient's Size	(0010,1020)	O	3*	Yes/No	No Matching is performed. Mapped into image and RDSR instance. Truncated to 16 bytes, end truncated
Patient's Address	(0010,1040)	O	3	No/No	Not Requested
Patient's Telephone Numbers	(0010,2154)	O	3	No/No	Not Requested
Patient's Age	(0010,1010)	O	3	No/No	Not Requested
Occupation	(0010,2180)	O	3	No/No	Not Requested
Patient's Birth Time	(0010,0032)	O	3	No/No	Not Requested
Patient's Insurance Plan Code Sequence	(0010,0050)	O	3	No/No	Not Requested
> 'Code Sequence Macro'					
Patient's Primary Language Code Sequence	(0010,0101)	O	3	No/No	Not Requested
> 'Code Sequence Macro'					
> Patient's Primary Language Code Modifier Sequence	(0010,0102)	O	3	No/No	Not Requested
>> 'Code Sequence Macro'					

Military Rank	(0010,1080)	O	3	No/No	Not Requested
Branch of Service	(0010,1081)	O	3	No/No	Not Requested
Country of Residence	(0010,2150)	O	3	No/No	Not Requested
Region of Residence	(0010,2152)	O	3	No/No	Not Requested
Ethnic Group	(0010,2160)	O	3	No/No	Not Requested
Patient's Religious Preference	(0010,21F0)	O	3	No/No	Not Requested
Patient Comments	(0010,4000)	O	3*	Yes/No	No Matching is performed. Mapped into image and RDSR instance. Truncated to 10240 bytes, end truncated

Note: * in the *Expected Return Key Type* column indicates that this information is displayed on screen, if available.

6.4.5.4 Patient Medical

Not applicable.

7. MODALITY PERFORMED PROCEDURE STEP IMPLEMENTATION

7.1 INTRODUCTION

This section specifies the use of the DICOM Modality Performed Procedure Step information to be communicated to the Hospital/Radiology information system.

This feature works in conjunction with DICOM Modality Worklist feature, if installed. However the conformance of this feature is independent of Modality Worklist feature. For information on conformance of Modality Worklist feature to DICOM standard please refer to the appropriate section in this document.

7.2 RELATIONSHIP BETWEEN SCHEDULED AND PERFORMED PROCEDURE STEPS

The Workstation supports following relationship between Scheduled Procedure Step and PPS:

1. Supports a one-to-one relationship between Scheduled Procedure Step and PPS
2. Supports one-to-multiple relationship: Append Case with new PPS based on Original SPS
3. Supports Unscheduled Case or Acquisition without MWL Data

7.3 MODALITY PERFORMED PROCEDURE STEP MODULE TABLE

See DICOM PS 3.3 and PS 3.4 for a complete definition of the entities, modules, and attributes.

TABLE 7-1
MODALITY PERFORMED PROCEDURE STEP MODULES

Module Name	Reference
SOP Common	7.4.1
Performed Procedure Step Relationship	7.4.2
Performed Procedure Step Information	7.4.3
Image Acquisition Results	7.4.4
Radiation Dose	7.4.5
Billing and Material Management Codes	7.4.6

7.4 MODALITY PERFORMED PROCEDURE STEP MODULE DEFINITIONS

Please refer to DICOM Standard PS 3.3. (Information Object Definitions) for a description of each of the attributes contained within the Modality Performed Procedure Step Information Object Definition.

7.4.1 SOP Common Module

TABLE 7-2
SOP COMMON MODULE ATTRIBUTES

Attribute Name	Tag	Type for SCU N-CREATE	Type for SCU N-SET	Use
Specific Character Set	(0008,0005)	1C	1C	ISO_IR 100

7.4.2 Performed Procedure Step Relationship Module

TABLE 7-3
PERFORMED PROCEDURE STEP RELATIONSHIP MODULE ATTRIBUTES

Attribute Name	Tag	Type for SCU - N-CREATE	
		Acquisition without MWL Entry	Acquisition with MWL Entry
Scheduled Step Attributes Sequence	(0040,0270)	1, Only 1 item	1, Only 1 item
>Study Instance UID	(0020,000D)	1, System generated.	1,Got from MWL.
>Referenced Study Sequence	(0008,1110)	2, Empty.	2, Got from MWL, Only 1 item.
>>Referenced SOP Class UID	(0008,1150)	1, Not sent	1, Got from MWL.
>>Referenced SOP Instance UID	(0008,1155)	1, Not sent	1, Got from MWL.
>Accession Number	(0008,0050)	2, User input. If user does not provide input values, then empty	2, Got from MWL.
>Placer Order Number/Imaging Service Request	(0040,2016)	3, Not sent	3, Not sent
>Filler Order Number/Imaging Service Request	(0040,2017)	3, Not sent	3, Not sent
>Requested Procedure ID	(0040,1001)	2, User input. If user does not provide input values, then empty	2, Got from MWL.
>Requested Procedure Code Sequence	(0032,1064)	3, Empty	3, Not sent
>>Code Value	(0008,0100)	1, Not sent	1, Not sent
>>Coding Scheme Designator	(0008,0102)	1, Not sent	1, Not sent
>>Code Meaning	(0008,0104)	1, Not sent	1, Not sent
>Requested Procedure Description	(0032,1060)	2, User input. If user does not provide input values, then empty	2, Got from MWL.
>Scheduled Procedure Step ID	(0040,0009)	2, User input. If user does not provide input values, then empty	2, Got from MWL.

>Scheduled Procedure Step Description	(0040,0007)	2, User input. If user does not provide input values, then empty	2, Got from MWL.
>Scheduled Protocol Code Sequence	(0040,0008)	2, empty	2, Got from MWL
>>Code Value	(0008,0100)	1, Not sent	1, Got from MWL
>>Coding Scheme Designator	(0008,0102)	1, Not sent	1, Got from MWL
>>Coding Scheme Version	(0008,0103)	3, Not sent	3, Got from MWL
>>Code Meaning	(0008,0104)	3, Not sent	3, Got from MWL
Patient's Name	(0010,0010)	2, User input. If user does not provide input values, then UNNAMED xxxxx should be assigned to Last Name (xxxxx is a 5-digital number)	2, Got from MWL.
Patient ID	(0010,0020)	2, User input. If user does not provide input values, then empty	2, Got from MWL.
Issuer of Patient ID	(0010,0021)	3, empty	3, Got from MWL.
Patient's Birth Date	(0010,0030)	2, User input. If user does not provide input values, then empty	2, Got from MWL.
Patient's Sex	(0010,0040)	2, User input. If user does not provide input values, then empty	2, Got from MWL.
Referenced Patient Sequence	(0008,1120)	2, empty.	2, empty.
>Referenced SOP Class UID	(0008,1150)	1, Not sent	1, Not sent
>Referenced SOP Instance UID	(0008,1155)	1, Not sent	1, Not sent
Admission ID	(0038,0010)	3, Not sent	3, Not sent
Issuer of Admission ID	(0038,0011)	3, Not sent	3, Not sent
Service Episode ID	(0038,0060)	3, Not sent	3, Not sent
Issuer of Service Episode ID	(0038,0061)	3, Not sent	3, Not sent
Service Episode Description	(0038,0062)	3, Not sent	3, Not sent

7.4.3 Performed Procedure Step Information Module

TABLE 7-4
PERFORMED PROCEDURE STEP INFORMATION MODULE ATTRIBUTES

Attribute Name	Tag	Type for SCU N-CREATE	Type for SCU N-SET	Use
Performed Procedure Step ID	(0040,0253)	1	-	Set to the value of 'Scheduled Procedure Step ID' value from MWL. Or, Set to value entered by the user. Or, Set to value generated by the equipment.
Performed Station AE Title	(0040,0241)	1	-	Got from configure file.
Performed Station Name	(0040,0242)	2	-	Got from configure file.
Performed Location	(0040,0243)	2	-	Got from configure file. The value is Hospital Name.
Performed Procedure Step Start Date	(0040,0244)	1	-	Same as exam start date
Performed Procedure Step Start Time	(0040,0245)	1	-	Same as exam start time
Performed Procedure Step Status	(0040,0252)	1	3	When PPS start (N-CREATE) message is sent, this element will have the value "IN PROGRESS" . When PPS end (N-SET) message is sent, this element will have either "COMPLETED" or "DISCONTINUED" based on user selection.
Performed Procedure Step Description	(0040,0254)	2	3	This value is Scheduled Procedure Step Description
Performed Procedure Type Description	(0040,0255)	2	3	From "Requested Procedure Description" on screen which is come from MWL.
Procedure Code Sequence	(0008,1032)	2	3	Always set as Empty for local created exam. When using MWL, this value is Requested Procedure Code Sequence.
>Code Value	(0008,0100)	1	1	Only when using MWL sent.
>Coding Scheme Designator	(0008,0102)	1	1	Only when using MWL sent.
>Coding Scheme Version	(0008,0103)	3	3	Only when using MWL sent.
>Code Meaning	(0008,0104)	3	3	Only when using MWL sent.
Performed Procedure Step End Date	(0040,0250)	2	3	Date when PPS end got installed
Performed Procedure Step End Time	(0040,0251)	2	3	Time when PPS end got installed
Comments on the Performed Procedure Step	(0040,0280)	3	3	Not sent
Performed Procedure Step Discontinuation Reason Code Sequence	(0040,0281)	3	3	Used when exam is DISCONTINUED. Provide a way let user to select one
>Code Value	(0008,0100)	1	1	Follow CID 9301

>Coding Scheme Designator	(0008,0102)	1	1	Follow CID 9301
>Coding Scheme Version	(0008,0103)	3	3	Follow CID 9301
>Code Meaning	(0008,0104)	3	3	Follow CID 9301

7.4.4 Image Acquisition Results Module

TABLE 7-5
IMAGE ACQUISITION RESULTS MODULE ATTRIBUTES

Attribute Name	Tag	Type for SCU N-CREATE	Type for SCU N-SET	Use
Modality	(0008,0060)	1	-	When user create a local scheduled exam, default value will be set. Got from MWL server.
Study ID	(0020,0010)	2	-	Got from MWL server or generated by equipment.
Performed Protocol Code Sequence	(0040,0260)	2	3	N-CREATE: always set as Empty. N-SET: Got from MWL.
>Code Value	(0008,0100)	1	1	Not sent
>Coding Scheme Designator	(0008,0102)	1	1	Not sent
>Coding Scheme Version	(0008,0103)	3	3	Not sent
>Code Meaning	(0008,0104)	3	3	Not sent
Performed Series Sequence	(0040,0340)	2	3	N-Set: Will be sent with referenced instances.
>Performing Physician's Name	(0008,1050)	2	2	Got from MWL server. User input.
>Protocol Name	(0018,1030)	1	1	When using MWL, if Scheduled Protocol Sequence Code Meaning is not empty then this value is Scheduled Protocol Sequence Code Meaning, else this value is Scheduled Procedure Step Description. It will be set as "Unknown Protocol" for local created exam.
>Operator's Name	(0008,1070)	2	2	Always set as Empty.
>Series Instance UID	(0020,000E)	1	1	System creates.
>Series Description	(0008,103E)	2	2	This value is Protocol Name.
>Retrieve AE Title	(0008,0054)	2	2	Always set as Empty.
> Archive Requested	(0040,A494)	3	3	Not sent
>Referenced Image Sequence	(0008,1140)	2	2	Will be sent with referenced images. One item for each image created within the series
>>Referenced SOP Class UID	(0008,1150)	1	1	Referenced image SOP Class UID.
>>Referenced SOP Instance UID	(0008,1155)	1	1	Referenced image SOP Instance UID.
>Referenced Non-Image Composite SOP Instance Sequence	(0040,0220)	2	2	Will be sent with referenced instance

>>Referenced SOP Class UID	(0008,1150)	1	1	Referenced instance SOP Class UID.
>>Referenced SOP Instance UID	(0008,1155)	1	1	Referenced instance SOP instance UID.

7.4.5 Radiation Dose Module

Table 7-6
Radiation Dose Module Attributes

Attribute Name	Tag	Type for SCU N-CREATE	Type for SCU N-SET	Use
Anatomic Structure, Space or Region Sequence	(0008,2229)	3	3	Always set as empty.
Total Time of Fluoroscopy	(0040,0300)	3	3	Got value from DB.
Total Number of Exposures	(0040,0301)	3	3	Got value from DB.
Distance Source to Detector (SID)	(0018,1110)	3	3	Got value from configure file.
Distance Source to Entrance	(0040,0306)	3	3	Not sent
Entrance Dose	(0040,0302)	3	3	Got value from DB.
Entrance Dose in mGy	(0040,8302)	3	3	The same with (0040,0302), but unit is mGy.
Exposed Area	(0040,0303)	3	3	Not sent
Image Area Dose Product	(0018,115E)	3	3	Got value from DB.
Comments on Radiation Dose	(0040,0310)	3	3	Not Used
Exposure Dose Sequence	(0040,030E)	3	3	Zero or more items shall be included in this sequence. The items count will be the shot count.
>Radiation Mode	(0018,115A)	3	3	The value reported will be 'CONTINUOUS' for all X-Ray modes except pulsed mode which will report 'PULSED'.
>KVp	(0018,0060)	3	3	Got value from DB.
>X-ray Tube Current in µA	(0018,8151)	3	3	Got value from DB.
>Exposure Time	(0018,1150)	3	3	Got value from DB.
>Filter Type	(0018,1160)	3	3	Not sent
>Filter Material	(0018,7050)	3	3	Not sent

7.4.6 Billing and Material Management Codes Module

TABLE 7-7
BILLING AND MATERIAL MANAGEMENT CODES MODULE ATTRIBUTES

Attribute Name	Tag	Type for SCU N-CREATE	Type for SCU N-SET	Use
Billing Procedure Step Sequence	(0040,0320)	3	3	Not sent
> 'Code Sequence Macro'				

Film Consumption Sequence	(0040,0321)	3	3	Not sent
>Number of Films	(2100,0170)	3	3	Not sent
>Medium Type	(2000,0030)	3	3	Not sent
>Film Size ID	(2010,0050)	3	3	Not sent
Billing Supplies and Devices Sequence	(0040,0324)	3	3	Not sent
>Billing Item Sequence	(0040,0296)	3	3	Not sent
>> 'Code Sequence Macro'				
>Quantity Sequence	(0040,0293)	3	3	Not sent
>>Quantity	(0040,0294)	3	3	Not sent
>>Measuring Units Sequence	(0040,0295)	3	3	Not sent
>>> 'Code Sequence Macro'				

7.5 STANDARD EXTENDED AND PRIVATE DATA ATTRIBUTES

The Workstation supports the Standard and Private Attributes defined in the following sections in Standard Extended MPPS Instances as Type 3 data elements.

7.5.1 Standard Attributes

The Workstation supports the following attributes, not specified in the MPPS IOD, in SOP Instances as Type 3 data elements.

TABLE 7-8
STANDARD EXTENDED ATTRIBUTES

Attribute Name	Tag	Use
N/A	N/A	N/A

7.6 STANDARD EXTENDED AND PRIVATE CONTEXT GROUPS

The Workstation supports coded terminology using Standard Extended, Private, and Configurable Context Groups defined in the following sections.

7.6.1 Standard Extended Context Groups

The Workstation supports the following extensions to standard Context Groups for SOP Instances created by this product. Extensions are indicated by **bold text.**

7.6.1.1 Context ID 9301 Modality PPS Discontinuation Reasons

CONTEXT ID 9301
MODALITY PPS DISCONTINUATION REASONS
TYPE: EXTENSIBLE VERSION: 20090616

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
DCM	110500	Doctor cancelled procedure
DCM	110501	Equipment failure
DCM	110502	Incorrect procedure ordered

DCM	110503	Patient allergic to media/contrast
DCM	110504	Patient died
DCM	110505	Patient refused to continue procedure
DCM	110506	Patient taken for treatment or surgery
DCM	110507	Patient did not arrive
DCM	110508	Patient pregnant
DCM	110509	Change of procedure for correct charging
DCM	110510	Duplicate order
DCM	110511	Nursing unit cancel
DCM	110512	Incorrect side ordered
DCM	110513	Discontinued for unspecified reason
DCM	110514	Incorrect worklist entry selected
DCM	110515	Patient condition prevented continuing
DCM	110516	Equipment change

8. STORAGE COMMITMENT PUSH MODEL IMPLEMENTATION

8.1 STORAGE COMMITMENT PUSH MODEL INFORMATION OBJECT DEFINITION

Please refer to DICOM Part 3 (Information Object Definitions) for a description of each of the attributes contained within the Storage Commitment Information Object.

The Storage Commitment Information Object is used both for N-ACTION Storage Commitment Requests by the SCU and N-EVENT-REPORT Storage Commitment Notifications by the SCP.

8.1.1 STORAGE COMMITMENT MODULE FOR N-ACTION

TABLE 8-1
STORAGE COMMITMENT MODULE FOR N-ACTION

Attribute Name	Tag	SCU Use	SCP Use
Transaction UID	(0008,1195)	1, Created by equipment, using prefix: 1.2.840.113619.8.320.+ TimeStamp_Current	1, Not used
Storage Media File-Set ID	(0088,0130)	3, Not used	3, Not used
Storage Media File-Set UID	(0088,0140)	3, Not used	3, Not used
Referenced SOP Sequence	(0008,1199)	1, Images/RDSR instances might be included here.	1, Not used
>Referenced SOP Class UID	(0008,1150)	1, Set to the modality configured in the product.	1, Not used
>Referenced SOP Instance UID	(0008,1155)	1, Set to the value generated by the product.	1, Not used
>Storage Media File-Set ID	(0088,0130)	3, Not used	3, Not used
>Storage Media File-Set UID	(0088,0140)	3, Not used	3, Not used

8.1.2 STORAGE COMMITMENT MODULE FOR N-EVENT-REPORT

TABLE 8-2
STORAGE COMMITMENT MODULE FOR N-EVENT-REPORT

Attribute Name	Tag	SCU Use	SCP Use
Transaction UID	(0008,1195)	Value received from SCP, if the value is empty,then return failed.	1, Not used
Retrieve AE Title	(0008,0054)	Not used	3, Not used
Storage Media File-Set ID	(0088,0130)	Not used	3, Not used
Storage Media File-Set UID	(0088,0140)	Not used	3, Not used

Referenced SOP Sequence	(0008,1199)	Success of storage commitment is reported to the user. This sequence will be used to mark storage status on screen. All the successed instance will marked as "Stored" in the system.	1, Not used
>Referenced SOP Class UID	(0008,1150)	Value received from SCP	1, Not used
>Referenced SOP Instance UID	(0008,1155)	Value received from SCP	1, Not used
>Retrieve AE Title	(0008,0054)	Not Used	3, Not used
>Storage Media File-Set ID	(0088,0130)	Not used	3, Not used
>Storage Media File-Set UID	(0088,0140)	Not used	3, Not used
Failed SOP Sequence	(0008,1198)	All the failed instance will not be marked as "Stored" in the system.	1, Not used
>Referenced SOP Class UID	(0008,1150)	Value received from SCP	1, Not used
>Referenced SOP Instance UID	(0008,1155)	Value received from SCP	1, Not used
>Failure Reason	(0008,1197)	See Section 8.1.2.1 for the list of processed values.	1, Not used

8.1.2.1 Processing of Failure Reason when received in a N-Event-Report

When receiving an N-Event-Report request with an Event Type ID equal to 2, meaning that Storage Commitment is complete, but failure exists, following is the set of value that this Storage Commitment SCU AE is able to process:

Failure Reason	Meaning	Application Behavior When Receiving Reason Code
0110H	Processing failure	Failure and reason is logged. A general failure is reported to the user.
0112H	No such object instance	
0213H	Resource limitation	
0122H	Referenced SOP Class not supported	
0119H	Class / Instance conflict	
0131H	Duplicate transaction UID	
*	Other Failure Reason code values	

9. BASIC DIRECTORY INFORMATION OBJECT IMPLEMENTATION

9.1 IOD MODULE TABLE

Table 9-1 identifies the defined modules within the entities which comprise the Basic Directory IOD. Modules are identified by Module Name.

See DICOM Part 3 for a complete definition of the entities, modules, and attributes.

TABLE 9-1
BASIC DIRECTORY IOD MODULES

Entity Name	Module Name	Reference
File Set Identification	File Set Identification	9.2.1
Directory Information	Directory Information	9.2.2

The FSC of this implementation creates a Directory Information Module for new media and creates XA IOD.

9.2 INFORMATION MODULE DEFINITIONS

Please refer to DICOM Standard Part 3 (Information Object Definitions) for a description of each of the entities and modules contained within the Basic Directory Information Object.

The following modules are included to convey Enumerated Values, Defined Terms, and Optional Attributes supported. Type 1 & Type 2 Attributes are also included for completeness and to define what values they may take and where these values are obtained from. It should be noted that they are the same ones as defined in the DICOM Standard Part 3 (Information Object Definitions). Also note that Attributes not present in tables are not supported.

9.2.1 File Set identification Module

TABLE 9-2
FILE-SET IDENTIFICATION MODULE

Attribute Name	Tag	Type	Attribute Description
File-set ID	(0004,1130)	2	Current DateTime stamp, format like:YYYYMMDDHHMMSS YYYY- year, MM- month, DD- day. HH – Hour 00-23, MM – minute 00-59, SS – second 00-59
File-set Descriptor File ID	(0004,1141)	3	Not Used
Specific Character Set of File-set Descriptor File	(0004,1142)	1C	Not Used

9.2.2 Directory Information Module

TABLE 9-3
DIRECTORY INFORMATION MODULE

Attribute Name	Tag	Type	Attribute Description

Offset of the First Directory Record of the Root Directory Entity	(0004,1200)	1	The number of bytes from the beginning of the file to the first byte of the first Directory Record. When the Root Directory entity contains no directory record, this offset is set to 00000000H
Offset of the Last Directory Record of the Root Directory Entity	(0004,1202)	1	The number of bytes from the beginning of the file to the first byte of the last Directory Record. When the Root Directory entity contains no directory record, this offset is set to 00000000H
File-set Consistency Flag	(0004,1212)	1	FSC writes 0000H: no known inconsistencies.
Directory Record Sequence	(0004,1220)	2	FSC creates items in this sequence (Directory Records).
>Offset of the Next Directory Record	(0004,1400)	1	Is set
>Record In-use Flag	(0004,1410)	1	Set the value to 0xFFFF for record is in use
>Offset of Referenced Lower-Level Directory Entity	(0004,1420)	1	Is set
>Directory Record Type	(0004,1430)	1	Enumerated Values are created by an FSC/FSU: PATIENT STUDY SERIES IMAGE SR DOCUMENT
>Private Record UID	(0004,1432)	1C	Not Used
>Referenced File ID	(0004,1500)	1C	Filename is generated to be unique on the media like: DCM<index>\IMG<number of image> Field is included if Directory Record Type is not PATIENT/STUDY/SERIES.
>Referenced SOP Class UID in File	(0004,1510)	1C	Field is included if Directory Record Type is not PATIENT/STUDY/SERIES. Unique ID for the SOP Class of the Instance stored in the referenced File.
>Referenced SOP Instance UID in File	(0004,1511)	1C	Field is included if Directory Record Type is not PATIENT/STUDY/SERIES. Unique Identifier for the SOP Instance stored in the referenced file.
>Referenced Transfer Syntax UID in File	(0004,1512)	1C	Field is included if Directory Record Type is not PATIENT/STUDY/SERIES. Unique Identifier for the Transfer Syntax used to encode the Instance stored in the referenced file.
> Referenced Related General SOP Class UID in File	(0004,151A)	1C	Not Used
>Record Selection Keys			See 9.2.3

9.2.3 Definition of Specific Directory Records

9.2.3.1 Patient Directory Record Definition

TABLE 9-4
PATIENT KEYS

Key	Tag	Type	Attribute Description
Specific Character Set	(0008,0005)	1C	ISO_IR 100
Patient's Name	(0010,0010)	2	FSC/FSU will fill this attribute with the value in the referenced composite object instance.
Patient ID	(0010,0020)	1	FSC/FSU will fill this attribute with the value in the referenced composite object instance. FSC/FSU will fill this mandatory attribute with a value "DCMTKPAT + 6 digits" if it is empty in the referenced composite object instance.

9.2.3.2 Study Directory Record Definition

TABLE 9-5
STUDY KEYS

Key	Tag	Type	Attribute Description
Specific Character Set	(0008,0005)	1C	ISO_IR 100
Study Date	(0008,0020)	1	FSC/FSU will fill this mandatory attribute with the value in the referenced composite object instance. This value is mandatory for Workstation, can't be empty.
Study Time	(0008,0030)	1	FSC/FSU will fill this mandatory attribute with the value in the referenced composite object instance. This value is mandatory for Workstation, can't be empty.
Study Description	(0008,1030)	2	FSC/FSU will fill this attribute with the value in the referenced composite object instance.
Study Instance UID	(0020,000D)	1C	FSC/FSU will fill this mandatory attribute with the value in the referenced composite object instance. This value is mandatory for Workstation, can't be empty.
Study ID	(0020,0010)	1	FSC/FSU will fill this mandatory attribute with the value in the referenced composite object instance. FSC/FSU will fill this mandatory attribute with a value "DCMTKSTUDY+ 6 digits" if it is empty in the referenced composite object instance.
Accession Number	(0008,0050)	2	FSC/FSU will fill this attribute using the value in the referenced composite object instance.

9.2.3.3 Series Directory Record Definition

TABLE 9-6
SERIES KEYS

Key	Tag	Type	Attribute Description
Specific Character Set	(0008,0005)	1C	ISO_IR 100
Modality	(0008,0060)	1	This will be consistent with Image Content
Series Instance UID	(0020,000E)	1	FSC/FSU will fill this mandatory attribute with the value in the referenced composite object instance. This value is mandatory for Workstation, can't be empty.
Series Number	(0020,0011)	1	FSC/FSU will fill this mandatory attribute with the value in the referenced composite object instance. FSC/FSU will fill this mandatory attribute with a value start from 1 (+1 for each series) if it is empty in the referenced composite object instance.
Icon Image Sequence	(0088,0200)	3	Not Used
>Include 'Image Pixel Macro'			See 9.2.3.3.1

9.2.3.3.1 Icon Image Key Definition

Not applicable.

9.2.3.4 Image Directory Record Definition

TABLE 9-7
IMAGE KEYS

Key	Tag	Type	Attribute Description
Specific Character Set	(0008,0005)	1C	ISO_IR 100
Image Type	(0008,0008)	3	FSC/FSU will fill this mandatory attribute with the value in the referenced composite object instance.
Instance Number	(0020,0013)	1	FSC/FSU will fill this mandatory attribute with the value in the referenced composite object instance.
Icon Image Sequence	(0088,0200)	3	FSC/FSU will create Icon Images at the image level.
>Include 'Image Pixel Macro'			See section 9.2.3.4.1

- Note: Please also refer to Section 3.2.1.2.1.1.1 for information about Additional Keys sent in DICOMDIR.

9.2.3.4.1 Icon Image Key Definition

- The FSC creates the icon image sequence from the referenced composite object instance. The FSR displays image icons to the user without reading the actual image pixel from the media.
- Samples Per pixel (0028,0002) is set to 1.
- Photometric Interpretations (0028,0004) is set to MONOCHROME2.
- Row (0028,0010) and Column (0028,0011) are set to 128,128.

- Bits Allocated (0028,0100) and Bits Stored (0028,0101) are created and set to 8.
- High Bit (0028,0102) is created and set to 7.
- Pixel Representation (0028,0103) is created and set to 0.

Pixel Data (7EF0,0010) is set with the 128x128 icon image data.

9.2.3.5 SR Document Directory Record Definition

TABLE 9-8
SR DOCUMENT KEYS

Key	Tag	Type	Attribute Description
Specific Character Set	(0008,0005)	1C	ISO_IR 100
Instance Number	(0020,0013)	1	FSC/FSU will fill this mandatory attribute with the value in the referenced composite object instance.
Completion Flag	(0040,A491)	1	"COMPLETE"
Verification Flag	(0040,A493)	1	"Unverified".
Content Date	(0008,0023)	1	First Shot Date
Content Time	(0008,0033)	1	First Shot Time
Verification DateTime	(0040,A030)	1C	Not Used
Concept Name Code Sequence	(0040,A043)	1	One item shall be included in this sequence.
>Code Value	(0008,0100)	1	"113701"
>Coding Scheme Designator	(0008,0102)	1	"DCM"
>Code Meaning	(0008,0104)	1	"X-Ray Radiation Dose Report"
Content Sequence	(0040,A730)	1C	Used
>Relationship Type	(0040,A010)	1	All, and only, Content Items with the HAS CONCEPT MOD relationship from the root Content Item shall be included in this Sequence.
>Include 'Document Content Macro'			

9.3 PRIVATE DATA DICTIONARY

Not applicable.

10. PRINT MANAGEMENT IMPLEMENTATION

10.1 INTRODUCTION

This section of the DICOM Conformance Statement specifies the implementation for the specific SOP Classes supported in the Basic Grayscale Print Management Meta SOP Class, the attributes supported for both IODs and services, and the valid range of values for mandatory and optional attributes.

10.2 BASIC FILM SESSION SOP CLASS

10.2.1 Basic Film Session N-Create Attributes

This table lists the attributes that are sent in the Basic Film Session N-Create Request:

Attribute name	Tag	Usage SCU/SCP	Attribute Description
Specific Character Set	(0008,0005)	U/U	Not Used
Number of Copies	(2000,0010)	U/M	Range of this value is 1-10, default is 1.
Print Priority	(2000,0020)	U/M	Enumerated Terms can be sent:HIGH or MED or LOW
Medium Type	(2000,0030)	U/M	Enumerated Terms can be sent: PAPER, CLEAR FILM, BLUE FILM, MAMMO CLEAR FILM, MAMMO BLUE FILM
Film Destination	(2000,0040)	U/M	Enumerated Terms can be sent: MAGAZINE or PROCESSOR
Film Session Label	(2000,0050)	U/U	Set to "GEHC OEC Print SCU"
Memory Allocation	(2000,0060)	U/U	Not Used
Owner ID	(2100,0160)	U/U	Set to "GEHC OEC"

10.2.2 Basic Film Session N-Delete

The N-DELETE is used to delete the complete Basic Film Session SOP Instance hierarchy. As a result, all references to Image SOP Instances within the film session are deleted.

10.3 BASIC FILM BOX SOP CLASS

10.3.1 Basic Film Box N-Create Attributes

This table lists the attributes that are sent to the SCP in the Basic Film Box N-Create Request, and that are received in the Basic Film Box N-Create Response from the SCP.

Attribute Name	Tag	Usage SCU/SCP	Attribute Description
Image Display Format	(2010,0010)	M/M	User configurable. User values =: STANDARD\1,1 STANDARD\1,2

			STANDARD\2,1 STANDARD\2,2 STANDARD\2,3 STANDARD\3,3 STANDARD\3,4 STANDARD\4,4 STANDARD\4,5 STANDARD\5,4 Default value: First selection when declaring printer.
Referenced Film Session Sequence	(2010,0500)	M/M	Used
>Referenced SOP Class UID	(0008,1150)	M/M	Set to 1.2.840.10008.5.1.1.1
>Referenced SOP Instance UID	(0008,1155)	M/M	This value should be returned from SCP in N-CREATE-RSP Basic Film Session SOP Class; Then this value is sent to SCP in N-CREATE-RQ Basic Film Box SOP Class requesting for Basic Grayscale Image Box SOP Class Instance UID which contained in Referenced Image Box Sequence from SCP.
Referenced Image Box Sequence	(2010,0510)	-/M	Used
>Referenced SOP Class UID	(0008,1150)	-/M	Set to 1.2.840.10008.5.1.1.4
>Referenced SOP Instance UID	(0008,1155)	-/M	Received in the N-Create Response from SCP, this value should be sent to SCP in N-SET-RQ Basic Grayscale Image Box SOP Class
Referenced Basic Annotation Box Sequence	(2010,0520)	-/MC	Not Used
>Referenced SOP Class UID	(0008,1150)	-/MC	Not Used
>Referenced SOP Instance UID	(0008,1155)	-/MC	Not Used
Film Orientation	(2010,0040)	U/M	Enumerated Terms can be sent: PORTRAITor LANDSCAPE
Film Size ID	(2010,0050)	U/M	Enumerated Terms can be sent: 8INX10IN 10INX12IN 10INX14IN 11INX14IN 14INX14IN 14INX17IN 24CMX24CM 24CMX30CM
Magnification Type	(2010,0060)	U/M	Set to BILINEAR
Max Density	(2010,0130)	U/M	User configurable. The default is 300
Configuration Information	(2010,0150)	U/M	User configurable. This value specifies the DICOM printer parameters. It is defined in the DICOM Printer's Conformance Statement file.

Referenced Presentation LUT Sequence	(2050,0500)	U/MC	Not Used
>Referenced SOP Class UID	(0008,1150)	U/MC	Not Used
>Referenced SOP Instance UID	(0008,1155)	U/MC	Not Used
Annotation Display Format ID	(2010,0030)	U/U	Not Used
Smoothing Type	(2010,0080)	U/U	Not Used
Border Density	(2010,0100)	U/U	Enumerated Terms can be sent: BLACK or WHITE
Empty Image Density	(2010,0110)	U/U	Enumerated Terms can be sent: BLACK or WHITE
Min Density	(2010,0120)	U/U	User configurable. The default is 20
Trim	(2010,0140)	U/U	Set to NO
Illumination	(2010,015E)	U/MC	Not Used
Reflected Ambient Light	(2010,0160)	U/MC	Not Used
Requested Resolution ID	(2020,0050)	U/U	Not Used
ICC Profile	(0028,2000)	U/U	Not Used

10.3.2 Basic Film Box N-Action Attributes

Following are the Action Reply arguments that are supported if present in the N-Action response of the Basic Film Box SOP Class.

Action Type Name	Action Type ID	Attribute	Tag	Usage SCU/SCP	Attribute Description
Print	1	Referenced Print Job Sequence	(2100,0500)	-/MC	Not Used
		>Referenced SOP Class UID	(0008,1150)	-/MC	Not Used
		>Referenced SOP Instance UID	(0008,1155)	-/MC	Not Used
		>Print Job ID	(2100,0010)	-/MC	Not Used

10.3.3 Basic Film Box N-Delete

The N-DELETE is used to delete the last created Basic Film Box SOP Instance hierarchy. As a result all the information describing the last film is deleted.

10.4 BASIC GRAYSCALE IMAGE BOX SOP CLASS

10.4.1 Basic Grayscale Image Box Pixel N-Set Attributes

This table lists the attributes that are sent in the Basic Grayscale Image Box N-Set Request:

Attribute Name	Tag	Usage SCU/SCP	Attribute Description
Image Position	(2020,0010)	M/M	Based on Image Display Format (2010,0010), range of values sent is [1 ~ 20].

Basic Grayscale Image Sequence	(2020,0110)	M/M	A sequence which provides the content of the grayscale image pixel data to be printed
>Samples Per Pixel	(0028,0002)	M/M	1
>Photometric Interpretation	(0028,0004)	M/M	MONOCHROME2
>Rows	(0028,0010)	M/M	Value is 1920 Note: For dose summary snapshot, this value will be 1920.
>Columns	(0028,0011)	M/M	Value is 1920 Note: For dose summary snapshot, this value will be 1920.
>Pixel Aspect Ratio	(0028,0034)	MC/M	Not Used
>Bits Allocated	(0028,0100)	M/M	Value is 8
>Bits Stored	(0028,0101)	M/M	Value is 8
>High Bit	(0028,0102)	M/M	Value is 7
>Pixel Representation	(0028,0103)	M/M	0
>Pixel Data	(7FE0,0010)	M/M	Image Pixels
Polarity	(2020,0020)	U/M	Not Used
Magnification Type	(2010,0060)	U/U	Not Used
Smoothing Type	(2010,0080)	U/U	Not Used
Min Density	(2010,0120)	U/U	Not Used
Max Density	(2010,0130)	U/U	Not Used
Configuration Information	(2010,0150)	U/U	Not Used
Requested Image Size	(2020,0030)	U/U	Not Used
Requested Decimate/Crop Behavior	(2020,0040)	U/U	Not Used
Referenced Presentation LUT Sequence	(2050,0500)	U/U	Not Used
> Referenced SOP Class UID	(0008,1150)	U/U	Not Used
> Referenced SOP Instance UID	(0008,1155)	U/U	Not Used

10.5 PRINTER SOP CLASS

10.5.1 Printer N-Event-Report Attributes

The following table describes the Workstation behavior when receiving an N-Event-Report request from the Printer SCP depending on the Event Type ID value.

Event Type Name	Event Type ID	Attribute	Tag	Usage SCU/SCP	Attribute Description
Normal	1				Ignored
Warning	2	Printer Status Info	(2110,0020)	U/M	Ignored
		Film Destination	(2000,0040)	U/U	Ignored
		Printer Name	(2110,0030)	U/U	Ignored
Failure	3	Printer Status Info	(2110,0020)	UM	Ignored
		Film Destination	(2000,0040)	U/U	Ignored
		Printer Name	(2110,0030)	U/U	Ignored

10.5.2 Printer N-Get Attributes

Attribute Name	Tag	Usage SCU/SCP	Attribute Description
Printer Status	(2110,0010)	U/M	When status is FAILURE, we'll not execute print any more and inform user print fail and the printer status is abnormal
Printer Status Info	(2110,0020)	U/M	Ignored
Printer Name	(2110,0030)	U/U	Ignored
Manufacturer	(0008,0070)	U/U	Ignored
Manufacturer Model Name	(0008,1090)	U/U	Ignored
Device Serial Number	(0018,1000)	U/U	Ignored
Software Versions	(0018,1020)	U/U	Ignored
Date Of Last Calibration	(0018,1200)	U/U	Ignored
Time Of Last Calibration	(0018,1201)	U/U	Ignored

11. QUERY IMPLEMENTATION

11.1 WORKSTATION MAPPING OF DICOM ENTITIES

The Workstation maps DICOM Information Entities to local Information Entities in the product's database and user interface.

TABLE 11-1
MAPPING OF DICOM ENTITIES TO WORKSTATION ENTITIES

DICOM	Workstation Entity
Patient	Exam
Study	Exam
Series	Exam
Image	Image

11.2 INFORMATION MODEL KEYS

Please refer to DICOM Standard PS 3.4 (Service Class Specifications) for a description of each of the levels contained within the Query/Retrieve Information Model.

11.2.1 Common Query Keys

The query key attributes specified in this section are used at all levels and in all classes of query.

TABLE 11-2
Q/R PATIENT LEVEL COMMON RETRIEVE ATTRIBUTES

Attribute Name	Tag	Type	SCU Use
Specific Character Set	(0008,0005)	-	See 11.2.1.1.1
Query Retrieve Level	(0008,0052)	-	Set to level of query: PATIENT STUDY SERIES IMAGE
Retrieve AE Title	(0008,0054)	-	Returned value will be used for Retrieve AE Title of retrieval of query response item.
Storage Media File-set ID	(0088,0130)	-	Attribute is not requested. Returned value is ignored.
Storage Media File-set UID	(0088,0140)	-	Attribute is not requested. Returned value is ignored.

11.2.1.1 Q/R Common Attribute Descriptions

11.2.1.1.1 Specific Character Set

In Query requests the character set tag (0008,0005) is set to "ISO_IR 100" for all requests.

In processing of query responses the character set tag (0008,0005) is checked: absence of the tag is defined as ISO_IR 6 (7 bit ASCII) or the tag is present ISO_IR 100 (ISO-8859-1 Latin 1) will be accepted.

11.2.2 Patient Level

This section defines the keys at the Patient Level of the Patient Root Query/Retrieve Information Models that are supported by this implementation.

TABLE 11-3
PATIENT LEVEL ATTRIBUTES FOR THE PATIENT ROOT QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type	SCU Use
Patient's Name	(0010,0010)	R*	Single value and wildcard matching are supported. User could enter anything (including wildcard) except "^","=" and "\". The value entered by the user will be used as matching key, but the response from server depends on server's capability. During the DICOM archive/sending, the "^" and "=" will be used as delimiter (added by system) in Patient Name components.
Patient ID	(0010,0020)	U*	Single value and wildcard matching are supported. User could enter anything (including wildcard) except "\". The value entered by the user will be used as matching key, but the response from server depends on server's capability.
Referenced Patient Sequence	(0008,1120)	O	Not Requested
>Referenced SOP Class UID	(0008,1150)	O	Not Requested
>Referenced SOP Instance UID	(0008,1155)	O	Not Requested
Patient's Birth Date	(0010,0030)	O	Universal Matching
Patient's Birth Time	(0010,0032)	O	Not Requested
Patient's Sex	(0010,0040)	O	Universal Matching
Other Patient IDs	(0010,1000)	O	Not Requested
Other Patient Names	(0010,1001)	O	Not Requested
Ethnic Group	(0010,2160)	O	Not Requested
Patient Comments	(0010,4000)	O	Not Requested
Number of Patient Related Studies	(0020,1200)	O	Universal Matching
Number of Patient Related Series	(0020,1202)	O	Universal Matching
Number of Patient Related Instances	(0020,1204)	O	Universal Matching

Note: * in the *Type* column indicates that this information is displayed on screen, if available.

11.2.3 Study Level – Patient Root

This section defines the keys at the Study Level of the Patient Root Query/Retrieve Information Models that are supported by this implementation.

TABLE 11-4
STUDY LEVEL ATTRIBUTES FOR THE PATIENT ROOT QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type	SCU Use
Study Date	(0008,0020)	R*	Range value matching is supported. User could select one of "All", "Today", "Since Yesterday", "Last 3 days", "Last 7 days" and "Last 30 days" from the screen, and then date information will be sent as "yyyymmdd-yyyymmdd" format to the server for matching.
Study Time	(0008,0030)	R*	Universal Matching
Accession Number	(0008,0050)	R*	Single value and wildcard matching are supported. Leading and trailing wildcard matching for value entered. The value entered by the user will be used as matching key.
Study ID	(0020,0010)	R	Universal Matching
Study Instance UID	(0020,000D)	U	Universal Matching
Modalities in Study	(0008,0061)	O	Universal Matching
SOP Classes in Study	(0008,0062)	O	Not Requested
Referring Physician's Name	(0008,0090)	O	Not Requested
Study Description	(0008,1030)	O*	Universal Matching
Procedure Code Sequence	(0008,1032)	O	Not Requested
>Code Value	(0008,0100)	O*	Not Requested
>Coding Scheme Designator	(0008,0102)	O	Not Requested
>Coding Scheme Version	(0008,0103)	O	Not Requested
>Code Meaning	(0008,0104)	O	Not Requested
Name of Physician(s) Reading Study	(0008,1060)	O	Not Requested
Admitting Diagnoses Description	(0008,1080)	O	Not Requested
Referenced Study Sequence	(0008,1110)	O	Not Requested
>Referenced SOP Class UID	(0008,1150)	O	Not Requested
>Referenced SOP Instance UID	(0008,1155)	O	Not Requested
Issuer of Patient ID	(0010,0021)	O	Not Requested
Patient's Age	(0010,1010)	O	Not Requested
Patient's Size	(0010,1020)	O	Not Requested
Patient's Weight	(0010,1030)	O	Not Requested

Occupation	(0010,2180)	O	Not Requested
Additional Patient History	(0010,21B0)	O	Not Requested
Other Study Numbers	(0020,1070)	O	Not Requested
Number of Study Related Series	(0020,1206)	O	Universal Matching
Number of Study related Instances	(0020,1208)	O	Universal Matching
Interpretation Author	(4008,010C)	O	Not Requested

Note: * in the *Type* column indicates that this information is displayed on screen, if available.

11.2.4 Study Level – Study Root

This section defines the keys at the Study Level of the Study Root Query/Retrieve Information Model that are supported by this implementation.

TABLE 11-5
STUDY LEVEL ATTRIBUTES FOR THE STUDY ROOT QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type	SCU Use
Study Date	(0008,0020)	R*	Range value matching is supported. User could select one of "All", "Today", "Since Yesterday", "Last 3 days", "Last 7 days" and "Last 30 days" from the screen, and then date information will be sent as "yyyymmdd-yyyymmdd" format to the server for matching. **All**: All matches. **Today**: Date Range Matches "Today – Today" **Since Yesterday**: Date Range Matches "Yesterday - Today" **Last 3 days**: Date Range Matches "2 days before – Today" **Last 7 days**: Date Range Matches "6 days before – Today" **Last 30 days**: Date Range Matches "29 days before – Today" Default: Last 3 days.
Study Time	(0008,0030)	R*	Universal Matching. Always blank in the request.
Accession Number	(0008,0050)	R*	Single value and wildcard matching are supported. The value entered by the user will be used as matching key.
Study ID	(0020,0010)	R	Universal Matching

Patient's Name	(0010,0010)	R*	Single value and wildcard matching are supported. User could enter anything (including wildcard) except "^","=" and "\". The value entered by the user will be used as matching key, but the response from server depends on server's capability. During the DICOM archive/sending, the "^" and "=" will be used as delimiter (added by system) in Patient Name components.
Patient ID	(0010,0020)	R*	Single value and wildcard matching are supported. User could enter anything (including wildcard) except "\". The value entered by the user will be used as matching key, but the response from server depends on server's capability.
Study Instance UID	(0020,000D)	U	Universal Matching
Modalities in Study	(0008,0061)	O	Universal Matching
SOP Classes in Study	(0008,0062)	O	Not Requested
Referring Physician's Name	(0008,0090)	O	Not Requested
Study Description	(0008,1030)	O*	Universal Matching
Procedure Code Sequence	(0008,1032)	O	Not Requested
>Code Value	(0008,0100)	O	Not Requested
>Coding Scheme Designator	(0008,0102)	O	Not Requested
>Coding Scheme Version	(0008,0103)	O	Not Requested
>Code Meaning	(0008,0104)	O	Not Requested
Name of Physician(s) Reading Study	(0008,1060)	O	Not Requested
Admitting Diagnoses Description	(0008,1080)	O	Not Requested
Referenced Study Sequence	(0008,1110)	O	Not Requested
>Referenced SOP Class UID	(0008,1150)	O	Not Requested
>Referenced SOP Instance UID	(0008,1155)	O	Not Requested
Issuer of Patient ID	(0010,0021)	O	Not Requested
Patient's Age	(0010,1010)	O	Not Requested
Patient's Size	(0010,1020)	O	Not Requested
Patient's Weight	(0010,1030)	O	Not Requested
Occupation	(0010,2180)	O	Not Requested
Additional Patient History	(0010,21B0)	O	Not Requested
Other Study Numbers	(0020,1070)	O	Not Requested
Number of Study Related Series	(0020,1206)	O	Universal Matching

Number of Study related Instances	(0020,1208)	O	Universal Matching
Interpretation Author	(4008,010C)	O	Not Requested
Referenced Patient Sequence	(0008,1120)	O	Not Requested
>Referenced SOP Class UID	(0008,1150)	O	Not Requested
>Referenced SOP Instance UID	(0008,1155)	O	Not Requested
Patient's Birth Date	(0010,0030)	O	Universal Matching
Patient's Birth Time	(0010,0032)	O	Not Requested
Patient's Sex	(0010,0040)	O	Universal Matching
Other Patient IDs	(0010,1000)	O	Not Requested
Other Patient Names	(0010,1001)	O	Not Requested
Ethnic Group	(0010,2160)	O	Not Requested
Patient Comments	(0010,4000)	O	Not Requested
Number of Patient Related Studies	(0020,1200)	O	Not Requested
Number of Patient Related Series	(0020,1202)	O	Not Requested
Number of Patient Related Instances	(0020,1204)	O	Not Requested

Note: * in the *Type* column indicates that this information is displayed on screen, if available.

11.2.5 Series Level

This section defines the keys at the Series Level of the Patient Root and Study Root Query/Retrieve Information Models that are supported by this implementation.

TABLE 11-6
SERIES LEVEL ATTRIBUTES FOR THE QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type	SCU Use
Modality	(0008,0060)	R*	Single value matching is supported. User could select one of "XA", "RF", "CR", "SC" and “ALL” for Modality Type from screen, then the corresponding string "XA", "RF", "CR", "OT" and “” will be sent to server for matching. Note: "ALL" means ignore the Modality Type, the Modality Type will leave empty during sending.
Series Number	(0020,0011)	R	Universal Matching
Series Instance UID	(0020,000E)	U	Universal Matching
Number of Series Related Instances	(0020,1209)	O	Universal Matching
Series Description	(0008,103E)	O	Universal Matching

Performed Procedure Step ID	(0040, 0253)	O	Not Requested
Referenced Performed Procedure Step Sequence	(0008,1111)	O	Not Requested
>Referenced SOP Class UID	(0008,1150)	O	Not Requested
>Referenced SOP Instance UID	(0008,1155)	O	Not Requested
Request Attribute Sequence	(0040, 0275)	O	Not Requested
>Requested Procedure ID	(0040,1001)	O	Not Requested
>Scheduled Procedure Step ID	(0040,0009)	O	Not Requested
Performed Procedure Step Start Date	(0040,0244)	O	Not Requested
Performed Procedure Step Start Time	(0040,0245)	O	Not Requested

Note: ***** in the *Type* column indicates that this information is displayed on screen, if available.

11.2.6 Image Level

Currently no Image level query requests are made.