X-Ray Quickstart Installation Guide

Working together to get your new technology online and begin providing patient care.
Start Here... for a Quick Finish...

Select Site for System

Select Design & Construction Team

Preliminary Floor Plan & Evaluation

Develop Preliminary Project Plan

Construction Drawings

Plan Review & Permits

Pre-Construction Meeting & Finalize Project Schedule

Construction

GE Final Installation Drawings

QuickStart Here!

System Delivery

Installation & Calibration

Application Training & First Patient

Site Ready

QuickStart Here!

Customer Primary (GE Secondary)

GE Primary (Customer Secondary)
X-ray Quickstart Installation Guide
X-Ray Edition

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This icon will signify Safety related items throughout this document
Use of This Guide

Installation of your new GE Healthcare X-Ray System requires that your site be prepared to satisfy the product’s unique specifications. Our mutual goal is to prepare for delivery and installation of your X-Ray System in a timely manner.

GE Healthcare has extensive experience assisting customers in preparing their sites for Equipment delivery and installation. This Guide is intended to give you an overview of the GE Healthcare experiential knowledge for the Site Readiness process required to prepare your site for delivery and installation of your X-Ray System and contains the following:

- Site Selection
- Project Team
- Preliminary Plans
- Construction Plans
- Plan Review
- Pre-construction Meeting
- Site Ready
- System Delivery
- Installation & Calibration
- Applications
- Close-Out Meeting

In addition, your site specific plan and design requires the use of the full set of planning information and specifications found in the GE Healthcare Pre-Installation Manual (PIM) and Final Installation Drawings for your X-Ray System. Please contact your GE Project Manager-Installation if you have not yet received a copy of the GE Healthcare Pre-Installation Manual (PIM) or you can view and download it electronically via this link:

http://www.gehealthcare.com/company/docs/siteplanning.html

An electronic version of this X-ray Quickstart Installation Guide is also available at this link.

You can utilize this Guide with your facilities team, System users, architects, engineers, contractors or others involved in the design and construction of your site. Some material content is repeated in multiple sections for completeness of information within a section.

Your GE Healthcare team is here to help. Your GE Healthcare Project Manager-Installation is your GE Healthcare focal point. Please contact your GE Healthcare Project Manager-Installation with any questions.
Sample Meeting Agenda

Covered in initial Site Meeting by Project Manager

<table>
<thead>
<tr>
<th>Topics of Discussion</th>
<th>Reviewed</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>Establish meeting with facilities/architect/contractor (customer group) &amp; Define main point of Contact for project communications (Project Owner)</td>
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<tr>
<td>Understand / Clarify &amp; Agree to Customer expectations</td>
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<tr>
<td>Define project scope / needs / timing “first patient use”</td>
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<tr>
<td>Project/site consultation (help determine site/build location)</td>
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<tr>
<td>Review list of “gotcha’s”, FAQ’s with PIM references in Quickstart Installation Guide (ex: Require UPS?)</td>
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<tr>
<td>Discuss permitting requirements and timing</td>
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<tr>
<td>Define future expansion/upgrades</td>
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<tr>
<td>Outline associates program &amp; potential uses / benefits as needed</td>
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<td></td>
</tr>
<tr>
<td>Any project cost estimation (Associates / MedFACS) optional</td>
<td></td>
<td></td>
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<tr>
<td>Other Critical Items (List items)</td>
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</tbody>
</table>

X-Ray Quickstart Installation Guide - Critical Sections
(1. Schedule, 2. Roles & Responsibilities, 3. Siting Requirements)

Introduction sheet
(Indicating Key Contacts: Sales, Install, Service, Apps)

Provide Typical Drawing (minimum prelims)
Site Evaluation

There are several ways to accommodate your GE Healthcare X-Ray System as a fixed installation at your site.

Some examples are the following:

- New Facility
- Building Addition
- Renovation
- Replacement of existing X-Ray System or upgrade
- Leased Space
- Modular Building
Site Evaluation (continued)

The specific site you select influences the complexity, schedule and cost of the project. Your GE Healthcare Project Manager-Installation will help you identify the best potential locations for optimal performance.

Some questions to consider:

- What type of GE Healthcare X-Ray System did you purchase?
- Is the X-Ray System to be located at your existing facility, new independent clinic, medical office building, or leased space?
- Do you plan on any future expansion into the surrounding area?
- Is the location appropriate for X-Ray System weight, size, acoustics, and other specific requirements in the Pre-Installation Manual?
- What suite design provides the most efficient workflow for your staff and flow of patients? (Including proximity to other facility functions and diagnostic imaging equipment)
- Is space available in your existing building to renovate?
- Is space available to build an addition?
- Are you replacing or upgrading an existing X-Ray System (in existing room)?
- Is this an independent clinic ‘constructed on site’ or a modular building?

Radiation Protection

GEHC does not make recommendations regarding radiation protection. It is the purchasers responsibility to consult a radiation physicist for advice on radiation protection specific to their site.

All specifications can be found in your GE Healthcare Pre-Installation Manual.
Site Evaluation (continued)

**Electromagnetic Interference (EMI)**

The Electro-Magnetic Interference (EMI) and Power Quality at your site can have an effect on the X-Ray System performance. Your site should be tested to ensure your site is within specifications given in the Pre-Installation Manual. If your site is determined to be out of specification, you will need to make necessary corrections.

**Structural Floor/Ceiling Requirements**

Refer to the GEHC Pre-installation manual for ceiling requirements. Not meeting the specifications listed in the Pre-Installation Manual will result in personal injury and/or equipment damage. It is the purchaser’s responsibility to consult a structural engineer.

**Equipment Delivery**

The equipment delivery route and access point need to be reviewed. Review the site to determine if floor support is needed along the delivery path during the delivery and transport of the entire X-Ray system.

Consult your GE Healthcare Project Manager-Installation for questions concerning the evaluation of your site.

You will receive the Preliminary Floor Plan from your GE Healthcare Project Manager-Installation.

We recommend that you review the plan with your entire Team.

In order for the GE Healthcare Installation Drawings to begin, you will need to provide written approval of the Preliminary Plan to your GE Healthcare Project Manager-Installation.
Project Team

This Guide is intended for both experienced and inexperienced customer teams. We recommend this Guide be utilized by your team members, including:

- Senior Management
- Project Manager
- Architect and Engineer team
- Construction team
- Information Technology Representative
- System Users
- Other personnel affected by the project

Your team’s involvement is critical to the success of your project’s design and construction process. It is very important to identify your specific team members and start team meetings early in the project in order to develop a quality floor plan and an objective schedule.

A well developed and executed plan and project schedule helps to minimize the possibility of delays in equipment delivery and installation thereby potentially avoiding:

- Lost revenue (loss of scheduled patient exams)
- Cost overruns for construction

We have frequently observed that the capabilities of the customers’ project architect and contractors are critical factors to the overall success of the project. At your request, GE Healthcare can provide a list of architects, designers and contractors in your area that are familiar with medical construction projects (Associates Program).
Selecting Your Design and Construction Team

Selecting the right design and construction team is important to the outcome of your project. Each GE Healthcare X-Ray System has unique and specific site preparation requirements. The design and construction professionals that you hire will need to refer to the site planning information that is provided by GE Healthcare for your specific product.

When assessing the design professionals’ and the contractors’ qualifications, it is a good idea to consider the amount of experience they have with respect to site renovation, design and construction for an X-Ray System installation.

At this time you can decide on whether you will use the Design-Build approach or the Design-Bid-Build approach for your project:

1. **Design-Build (D-B)**

   For D-B you will be looking for a contractor that has design capability or a design team with construction capability. You will enter into a contract with only one company for all of the services. This method will eliminate the need for a bid cycle after construction drawings are complete.

2. **Design-Bid-Build (D-B-B)**

   For D-B-B you will enter into a contract with the design teams as well as the general contractor. This approach may require additional project management from your staff between all of the parties where the design-build approach usually has only one single point of contact. This method will create the need for a bid cycle after construction drawings are complete.

Organizations similar to the American Institute of Architects (AIA) have various documents to use for questioning and qualifying the potential companies.

Once you review the qualifications and select one or more companies to bid, they should be invited to a pre-bid meeting at the project location. This meeting will focus everyone on the scope and preliminary schedule of the project.

At your request, GE Healthcare will provide a list of suppliers, (Associates Program) in your area that can provide these services.

Your GE Healthcare Project Manager-Installation will assist in gathering the necessary information to prepare a preliminary plan. Your site will need to be evaluated to determine if you require additional ceiling/floor structural support, radiation protection, acoustic mitigation etc. You may need to review more than one location and room configuration to obtain the optimal location for your new System.

**Team Collaboration**

Identify your Site Review Team. For an effective site design, obtain all team and user inputs for work flow, patient flow, and facility arrangement.

It is the customer’s responsibility to evaluate potential design professionals or contractors for services.
## Roles and Responsibilities

<table>
<thead>
<tr>
<th>Key Touch Points</th>
<th>GE Healthcare</th>
<th>Customer</th>
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<tbody>
<tr>
<td>Initial Contact</td>
<td>Project Manager - Install (PMI)</td>
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<tr>
<td>RFP Response</td>
<td>Sales, PMI</td>
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<tr>
<td>Purchase Order Issue</td>
<td>Sales</td>
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<tr>
<td>Design Kick-off</td>
<td>PMI</td>
<td></td>
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<tr>
<td>Construction Kick-off</td>
<td>PMI</td>
<td></td>
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<tr>
<td>Project Manager - Install (PMI) Site Visit</td>
<td>PMI</td>
<td></td>
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<tr>
<td>30 - Day Status Report</td>
<td>PMI</td>
<td></td>
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<tr>
<td>Site &amp; Room Ready</td>
<td>PMI</td>
<td></td>
</tr>
<tr>
<td>Delivery and Mechanical Install</td>
<td>Service Engineer (SE), Sales, PMI</td>
<td></td>
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<tr>
<td>Calibration</td>
<td>SE</td>
<td></td>
</tr>
<tr>
<td>Acceptance</td>
<td>SE</td>
<td></td>
</tr>
<tr>
<td>Application</td>
<td>SE, Sales, PMI</td>
<td></td>
</tr>
<tr>
<td>Close Out Meeting</td>
<td>PMI, SE, Sales, PACS Engineer, System Administrator, Director of Service</td>
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</table>
GE Healthcare Support

Your Project Manager-Installation

GE Healthcare provides support through your Project Manager-Installation. This support for your Site Readiness process will be provided through the following primary activities:

• Assist in assessing your site for location of your X-Ray System

• Assist in developing a preliminary site layout of your X-Ray System

• Provide site design specifications for your architect and engineer to utilize in the design of your site as found in the GE Healthcare Pre-Installation Manual (PIM) for your X-Ray System

• Provide GE Healthcare Installation Drawings

• Provide supporting information to your contractor(s) for schedule development and construction planning

• Assist in monitoring completion of the Site Readiness Assessment for the Equipment

• Assist in the coordination of delivery and installation activities

• Close-out Meetings
Key Responsibilities (This is not a comprehensive list of responsibilities)

**Customer**
- Focus communications among team members
- Review your GE Healthcare X-Ray Equipment Terms and Conditions of Sale
- Complete site-specific construction items prior to X-Ray System delivery – Refer to the Assessment List
- Ensure your representative is on site for acceptance and inventory of the equipment at time of delivery
- Secure Rigger services

**Architect / Engineer**
- Develop overall preliminary floor plan for customer site, and coordinate with GE Healthcare Project Manager-Installation
- Develop construction drawings and specifications
- Coordinate design with GE Healthcare Pre-Installation Manual and GE Healthcare Installation Drawings, ensuring all requirements are met
- Comply with applicable code requirements
- Coordinate plan review and approval process for permits
- Communicate with GE Healthcare Project Manager-Installation - questions, floor plan, equipment or schedule changes

**Contractor**
- Develop and communicate construction schedule to entire team
- Obtain construction permits
- Own the construction schedule, ensure delivery dates are met
- Build the site...manage sub-contractors...deliver a quality site
- Coordinate / communicate all issues with architect, engineer and GE Healthcare Project Manager-Installation
- Arrange for inspections
- Ensure Site Readiness Assessment is complete prior to delivery
- Coordinate Equipment delivery
- Ensure all safety requirements are met and site is secure
## Expectation Sign-Off

### List of Promises

<table>
<thead>
<tr>
<th>GE Healthcare</th>
<th>Customer</th>
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<tbody>
<tr>
<td>Preliminary Floor Plan &amp; Site Evaluation</td>
<td>Select Site for System</td>
</tr>
<tr>
<td>GE Healthcare Installation Drawings</td>
<td>Select Design &amp; Construction Team</td>
</tr>
<tr>
<td>Site Readiness Assessment Complete</td>
<td>Approve Preliminary Floor Plan</td>
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<tr>
<td>Site Readiness Assessment Complete</td>
<td>Develop Preliminary Project Timeline</td>
</tr>
<tr>
<td>System Delivery</td>
<td>Construction Drawings</td>
</tr>
<tr>
<td>Installation &amp; Calibration</td>
<td>Plan Review &amp; Permits</td>
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<tr>
<td>Application Training &amp; First Patient</td>
<td>Pre-Construction Meeting &amp; Finalize Project Schedule</td>
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<tr>
<td></td>
<td>Construction</td>
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<tr>
<td></td>
<td>Site Readiness Assessment Complete</td>
</tr>
</tbody>
</table>

GE Healthcare

Project Manager of Install

Signature: ____________________________

Date: ________________________________

Customer Name: ________________________

Manager In Charge of Install

Signature: ____________________________

Date: ________________________________
Develop Preliminary Project Plan

Early project planning enables on time project execution.

The earlier you develop the plan, the earlier you can identify when your X-Ray System will be available for patient use, as well as any potential risks to your project and schedule.

Early in the process your team should:

1. Develop a preliminary project work scope and floor plan:
   - Get input from your architect, builder, facilities team, and end users (technologist), landlord, etc.
   - Review and consider unique elements for the installation of your new X-Ray System detailed in the GE Healthcare Pre Installation Manual (PIM) and typical drawings.
   - The standard cycles and dates for the major project work scope elements and events should be considered when developing your preliminary project schedule.
   - The standard cycle times can be obtained from your supplier i.e., HVAC, etc.

2. Develop a preliminary project schedule:
   - A written project schedule, even though it is preliminary, will help you establish an objective “first-use” date for your GE Healthcare X-Ray System.
   - Identify the construction plan review, approval and permit process so the correct duration can be included in the project schedule.
   - Identify any required or potential zoning changes that are needed. Time required for such changes needs to be included in the project schedule.
   - Your GE Healthcare Project Manager-Installation will assist you in preparing the initial Equipment Installation project schedule for your site.

3. Determine your construction costs:
   - Get input from your architect, builder, facilities team, and end users (technologist), landlord, etc.
   - Review and consider unique elements for the installation of your new X-Ray System detailed in the GE Healthcare Pre Installation Manual (PIM) and typical drawings.
   - The standard cycles and dates for the major project work scope elements and events should be considered when developing your preliminary project schedule.
   - The standard cycle times can be obtained from your supplier i.e., HVAC, Ceiling Unistrut, etc...

Inputs from the end user are critical at this time of the process.
Design Kick-Off / Post Order Meeting

Required Attendees:

- Customer Design Team
  Dir of Radiology, Facilities Mgt, HIS, Networking, X-Ray Tech,
- GE Healthcare – Sales, PMI (Project Manager of Installation), Field Engineer

Pre-Requisites:

- PMI Received AutoCAD drawings from Customer’s Design Team
- PMI provided specs to Customer Design Team (PIM)
- Send meeting agenda to attendees prior to meeting
- Communicate estimated length of meeting (1 hour)
- Approval of preliminary GE Healthcare drawings

Agenda topics:

1. Introductions
2. Discuss roles, responsibilities and information flow
3. Introduce the Critical to Image Quality Checklist, review it and discuss interaction with contractor’s construction schedule, discuss typical lead times
4. Review initial drawings
5. Discuss any GE Healthcare equipment order changes relating to design
6. Site information to be discussed (modality specific).
   a. PMI received preliminary site layout from Customer’s architect
   b. Determine when EMI study will be done
   c. Determine if seismic anchoring is needed
   d. Determine when a structural evaluation will be completed.
7. Set preliminary delivery date, explain what happens if schedule is pushed – impact on delivery date
8. Establish when permit drawings will be ready for release

Follow-up:

- GE Healthcare Installation Drawings distributed from GE Healthcare Design Center
- Floor/ceiling structural design
- Follow-up E-mail detailing expectations sent to each participant with checklist attached
- Seismic Anchoring (if required)
Preliminary Project Plan

A Gantt chart is a tool commonly used for developing and tracking project schedules. Some tasks are dependent and require completion of preceding tasks before they can begin. The Gantt chart provided below is a sample schedule. The arrows show succession of tasks. The tasks shown are typical for most projects.

The duration of each task will depend on the type of project and specific needs for your site. Your site development team will need to collaborate to determine tasks needed and duration of each task in order to create the optimal schedule for your project.

The sample schedule (Gantt chart) in the Process Flow section of this Guide reflects many of the tasks you need to consider.
This portion of the Process Flow outlines further task descriptions for each step. Additional details are outlined in the Process Details section.

Note: This is not a comprehensive list of tasks or requirements in the Site Readiness process. You must work with your team to define all the specific scope and tasks for your site.

Select Site for System

- Finalize X-Ray System type to be installed
- Determine if New facility, addition, renovation, replacement, upgrade, modular building
- Gather X-Ray System user inputs
- Facility Planning involvement is necessary
- GE Healthcare Pre-Installation Manual and typical drawings provided by GE Healthcare Project Manager-Installation
- Determine if Certificate of Need (CON) or any special permitting is required

Select Design & Construction Team

- Select architect or qualified designer as early as possible
- Decide on Design-Build (D-B) or Design-Bid-Build (D-B-B) approach
- Conduct Pre-Bid Meeting
- Consider X-Ray experience as main criteria
- Hire a rigger – verify their experience (if required)

Preliminary Floor Plan & Site Evaluation

- Team collaboration
  - GE Healthcare Project Manager-Installation
  - Customer Team
- Perform Site Evaluation specific to your X-Ray System type (i.e. EMI, Acoustics, Floor/ceiling structural support and radiation protection)
- Perform Broadband (high-speed Internet) connectivity assessment
- Filming, printing & PACS interface requirements
- Review equipment delivery route and access point (e.g. is temporary shoring needed)
- Select location and room configurations
- Customer approval of Preliminary Floor Plan
Develop Preliminary Project Plan

- Select architect for input
- Define your project scope
  - Unique elements for X-Ray System configuration
  - Construction requirements
  - User Inputs are critical
- Finalize schematic floor plan of the entire project
- Develop preliminary written project schedule to establish objective first use date
- Agreement and commitment is required

GE Healthcare Installation Drawings

- Need customer approved Preliminary Floor Plan
- GE Healthcare Project Manager-Installation coordinates
- Customized to your site
- AutoCAD and PDF files provided by GE Healthcare (or prints)
- GE Healthcare’s Installation Drawings are NOT your construction drawings but should be incorporated into the Architect’s construction documents/plans

Construction Drawings

- Conduct site design kick-off meeting
- GE Healthcare Project Manager-Installation support
- Facility Planning / Landlord involvement is critical
- Your architect / engineering team is responsible for code & regulatory compliance
- Finalize equipment delivery route & access point
- Hold periodic team review meetings

Construction Drawings

- Required approvals vary per location
- Bid Construction if D-B-B
- Potential customer risk for schedule impact
- Permits to close street or sidewalk for delivery rigging
- Transportation permits for modular buildings

Cycle 1+ week
(If depends on X-Ray System configuration and options)

Cycle 3-7 weeks

Cycle varies
Pre-Construction Meeting & Finalize Project Schedule

Cycle 1 week

- Team collaboration
- Pre-Construction Review:
  - Critical that contractor, all suppliers and subcontractors are present
  - Critical Path events
  - Long Lead Items
  - Shop Drawings for Construction Fabrication
  - Project Schedule: focus on Exam, Equipment and Control Rooms
- Schedule commitment from entire team (this is critical)
- Coordinate project schedule with rigger
- Distribute appropriate construction drawings to the trade groups

Construction

Cycle 2 – 14 weeks (Site dependent)

- Communicate status updates to GE Healthcare Project Manager-Installation
- GE Healthcare Project Manager-Installation support for Q&A
- Complexity of project drives project cycle
- Critical Path items monitored and completed (i.e. HVAC, Power)
- Monitor Site Readiness Assessment
- Conduct required inspections and measurements
- Hold completion date: focus on Exam, Equipment, and Control Rooms
- Confirm Equipment delivery route
- Broadband (high-speed Internet) connection scheduled
- Hold periodic project team review meetings
- Order long-lead items

Site Ready!

- Site Readiness Assessment complete (can be found in Assessment List section of this Guide)
  - Led by the General Contractor, supported by GE Healthcare Project Manager-Installation
- Hold completion date: focus on Exam, Equipment, and Control Rooms
- General Contractor completes the construction punch list
- Schedule and finalize Equipment delivery dates
- Verify Broadband connection / IP address
# X-ray Quickstart Installation Guide

## Preliminary Plans

### System Delivery

Cycle 1-2 weeks

- Final schedule notification to rigger if needed
- Coordinate temporary sharing if needed
- GE Healthcare Project Manager-Installation or Service Engineer support
- Equipment delivery

### Installation & Calibration

Cycle 1-2 weeks (Depends on X-Ray System configuration and options)

- Mechanical Installation of X-Ray System
- Calibration by GE Healthcare Service Engineer
- Connect to Filming / PACS
- Connect to Broadband (high-speed Internet)
- Indicate need for trades people during mechanical install (electrician, facility)

### Applications Training & First Patient

Cycle < 1 week

- GE Healthcare Applications Specialist scheduled for on-site training
- Review TiP Pre-Training materials provided by GE Healthcare
- Select staff to participate in training
- Physician available during training
- Ancillary personnel support available to allow technologist participation
- TiP Education Center classes scheduled for technologists, if applicable
- Appropriate patient loads scheduled
- Identify mix of exam types appropriate to the practice

### Close-Out Meeting

- Follow-up requirements
- Project positives/Improvement areas
- Service hand-off
GE Healthcare Installation Drawings

The GE Healthcare Installation Drawings along with the Pre-Installation Manual (PIM) include all necessary input details to permit your design and construction team to create architectural and construction drawings.

Some key points to emphasize are:

- The drawings are provided in AutoCAD and PDF format for easy utilization by your design team. Hard copy drawings are also available.

- The GE Healthcare Installation Drawings are not construction drawings. Your architect and engineers must create the necessary set of construction drawings and specifications for your site that meet local, state and federal requirements.

- The GE Healthcare Pre-Installation Manual (PIM) must be carefully reviewed, understood and implemented by your architect, engineer and contractor.

- Any changes in the design by you or your architect, engineer, contractor or plan review agency require coordination with your GE Healthcare Project Manager-Installation.

- The GE Healthcare Installation Drawings may need to be revised to accommodate agreed design and construction changes.

Once approval of your Preliminary Plan is received, your GE Healthcare Project Manager-Installation will assist you and the GE Installation Design Center team to prepare the GE Healthcare Installation Drawings, customized for your site.
GE Healthcare Installation Drawings (continued)

It is imperative to enlist a competent architect, engineer and contractor team. Experience in medical facility design, construction and specifically in Medical System installations is highly recommended.

Sample Portion of GE Healthcare Installation Drawing

The GE Healthcare Installation Drawings are not construction drawings.
Preparing Construction Drawings

The construction documents describe and detail exactly what is needed to prepare your site for the installation of your GE Healthcare X-Ray System. Proper and accurate planning at this stage will reduce issues during the construction phase of the process.

It is helpful for you to conduct a design kick-off meeting to get everyone focused on the project scope and schedule. This meeting should be held at the project site to help facilitate any discussion around the existing conditions. The architect, engineers and contractor (if D-B) should all be invited to this meeting along with your facilities team. Your GE Healthcare Project Manager-Installation can attend these meetings to help answer any questions.

Hospital or clinic staff, facility planning department or landlord involvement is critical during the design phase to ensure any special requirements are met and any internal reviews and approvals are obtained.

The construction documents usually consist of design drawings and written specifications. You will need to check with the local authority having jurisdiction over plan review and permitting to determine if the drawings need to be sealed by licensed professionals. The responsible authorities may include the local planning and building department, state planning and building department, or state department of health.

GE Healthcare Installation Drawings:

The GE Healthcare Installation Drawings are not construction documents. Your design team will need to utilize the GE Healthcare Installation Drawings and Pre-Installation Manual (PIM) during the Design portion of the process. The requirements need to be interpreted by your design professionals in order to meet any site specific constraints and building code requirements.

Your GE Healthcare Project Manager-Installation is available to answer any questions regarding the GE Healthcare Installation Drawings. Please notify your GE Healthcare Project Manager-Installation whenever the site undergoes any design changes, so revised Installation Drawings can be provided.

Building Codes and Regulatory Compliance Requirements

Your design team is responsible for applicable building codes and regulatory compliance (including Americans with Disabilities Act (ADA) requirements, etc.). This includes the applicable building codes and State Health Department requirements, as well as any other regional specific design guidelines, regulations or requirements.

The American Institute of Architects (AIA) Academy of Architecture for Health, along with assistance from the U.S. Department of Health and Human Services issues the document “Guidelines for Design and Construction of Hospital and Health Care Facilities”.

This document is very useful during the Design process. These guidelines are used by many health departments and the Joint Commission for the Accreditation of Healthcare Organizations (JCAHO) as a reference or standard when reviewing and approving plans and when surveying, licensing, certifying, or accrediting completed facilities. Copies are available from the AIA.
Preparing Construction Drawings (continued)

Critical Design Elements:

The following list of design element requirements often generate questions. Although what follows is not a comprehensive list of all the design elements, it does contain items that require design team attention.

- Floor/ceiling structural support design
- Foundation design (i.e. seismic, vibration)
- Dedicated HVAC for the Exam/Equipment Room
- Recommended room sizes and ceiling heights
- Clearances for Equipment delivery and service
- Floor loading during the Equipment delivery process, and staging areas for unloading
- Equipment anchoring
- Floor levelness and preparation of the floor recess in the Exam/Equipment Room.
- GE Healthcare Equipment cable length
- Junction box, electrical duct, raceway size and alternates
- Power feeder requirements with specific power regulation and grounding requirements. (See Critical Items section)
- Main Disconnect Panel (MDP) (check the GE Healthcare Equipment order content)
- Uninterruptible Power Source (UPS) system, if one is required
- Personnel Telephone on 1st Phone line
- Broadband (high-speed) Internet connectivity
- Network connectivity
- Radiation Protection

The requirements for these items can be found in either the site specific GE Healthcare Installation Drawings or in the Pre-Installation Manual (PIM) for your specific X-Ray System.
Preparing Construction Drawings (continued)

**Delivery Concerns for your Design Team:**

Finalize the Equipment delivery route and access point during the Construction Drawing phase of the process. Make note of any doors to remove, and if temporary floor supports are required along the delivery path during the delivery transport of the equipment. Your engineer should include this in the design.

Identify and reserve staging areas for construction materials and the delivery of the X-Ray System, both inside and outside the facility.

**Plan Review and Approval:**

Once the construction documents are complete, they will need to be submitted for review to the planning department of the authority having jurisdiction for issuing permits for your location.

Your design team is responsible to meet all code requirements as well as the requirements of the GE X-Ray System. The design team has the responsibility to coordinate any plan reviews and necessary follow-ups with the planning department.

**Note:** Some jurisdictions require specific, periodic reviews during the Construction Drawing phase of the process.
Plan Review and Permits

This part of the process has high potential for project schedule impact. We strongly recommend that you hire an architect and engineer with experience in the medical field and specifically projects for Medical Equipment installations.

The project schedule contains many tasks that have potential to create delays or require improvements, and the Plan Review cycle is one of them.

If you are using the Design-Bid-Build approach for your project, this period of Plan Review would be a good time to bid out the construction. The bidding process can take several weeks depending on the complexity of the project and this usually fits right in with the Plan Review cycle.

The duration of the Plan Review process varies depending on your location and type of construction, potentially ranging from days to months. Plan Review for projects in hospitals can take longer than projects in a commercial setting. These review processes may require multiple stages at different completion percentages of the drawings and specifications. During the Review process, follow-up submission and further review may be required, which may impact the project schedule. Once the plans have been reviewed and approved, your contractor will be able to obtain the appropriate permits.

There are some cases and jurisdictions where demolition permits are available. These permits would allow for the start of the on-site work prior to the actual construction, possibly improving the project schedule.

Your contractor must schedule inspections throughout the construction process. The authority having jurisdiction may require a final inspection. When the inspection is satisfactorily completed, a certificate of occupancy is issued. In some situations the certificate of occupancy may be required before you can scan the first patient.

In addition to the necessary building permits, you may need to obtain a permit to close portions of the street or sidewalk to accommodate Equipment delivery vehicles. Note, if you are using modular buildings for your site, you may need transportation permits.

The GE Healthcare Installation Drawings are not construction drawings and should not be used for permits.
Pre-Construction Kick-Off Meeting

Purpose - Reinforce expectations, review specs, and answer questions. Establish timeline & solidify delivery date.

Required Attendees:

- Customer Team
  - Dir of Radiology, Facilities Mgt, HIS, Networking, X-Ray Tech, Customer Design Team
  - Contractor – Project Manager, Superintendent, Subcontractors (Mechanical, Electrical, RF Shield)
- GE Healthcare – Sales, PMI (Project Manager of Installation), Field Engineer

Pre-Requisites:

- Contractor Construction Schedule
- Construction drawings
- GE Healthcare Installation Drawings
- Send meeting agenda to attendees prior to meeting
- Communicate estimated length of meeting (1 hour)

Agenda Topics:

1. Introductions
2. Discuss roles, responsibilities and information flow.
3. Review Complete Installation Drawings
   a. Double check everyone has current revision
   b. Review page by page of the drawings
   c. Discuss any GE equipment order changes relating to design and construction
4. Review Quickstart Installation Guide
5. Review Equipment Delivery Path
   a. Review rigging requirements if needed
6. Review Contractor’s Project Schedule
7. Identify/discuss long lead material items related to the X-Ray system
   a. Exam/Equipment room HVAC unit
   b. Power, MDP delivery date
8. Establish final delivery date with agreement from all
9. Establish key GE Healthcare Milestones in calendar days (Built, Exam/Equipment/Control Room, Critical to Image Quality Items)
   a. 30 days prior to delivery date
   b. 15 days prior to delivery date
   c. 6 days prior to delivery date
10. Discuss disposal of equipment packing material and return of kits
11. Discuss safety and security relating to the GE Healthcare equipment

Follow-up:

- Plan site visits for milestone review
- Follow-up E-mail detailing expectations sent to each attendee with attached checklist
- Communicate delivery date
Pre-Construction Meetings

Pre-Construction Meeting Agenda

Once you obtain construction permits, you are ready to begin the construction phase. Early planning, agreement and commitment by all your project participants will help focus on the on-time delivery.

A Pre-Construction Review Meeting, at the project location, is a critical step to getting the entire team focused. This meeting is a team collaboration and should include your representative, facilities or landlord representative, the design team, the contractor’s project manager and superintendent and your GE Healthcare Project Manager-Installation.

<table>
<thead>
<tr>
<th>Facilitites/Landlord Representative</th>
<th>Architect</th>
<th>Contractor (PM and Super-intendent)</th>
<th>GE Project Manager-Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review the Site Readiness Assessment checklist of items to be completed for delivery of the Equipment (found in the Assessment List section of this Guide).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finalize the construction schedule. Recommend: Focus on completion of the Exam, Equipment and Control Rooms in order to meet delivery dates.</td>
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<tr>
<td>Set delivery dates for the Equipment, including any pre-delivery items.</td>
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<tr>
<td>Review the scope of the project and its impact on cycle times.</td>
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</tr>
<tr>
<td>Highlight critical path events/long lead items (e.g., HVAC equipment, permanent power for the X-Ray System, power feed and MDP, electrical ductwork)</td>
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</tr>
<tr>
<td>Identify roles and responsibilities for the shop drawings and submittals review process, in order to avoid schedule delays. (e.g., HVAC equipment)</td>
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</tr>
<tr>
<td>Review the GE Healthcare Installation Drawings and construction drawings in detail with all subcontractors to check for any issues (e.g., delivery requirements, corridor widths, etc.).</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Review and identify the delivery route and method for the Equipment. Verify if a local street access permit (if required) may be obtained for the delivery dates.</td>
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</tbody>
</table>
Pre-Construction Meeting Agenda (continued)

The contractor is responsible for the schedule and adherence to it. Use this meeting to make sure all project participants commit to the current project schedule. If the parties cannot reach consensus during this meeting, schedule a timely follow-up meeting, to ensure an on-time delivery.

Publish the final written project schedule, and distribute it to all members of the project team, including the GE Healthcare Project Manager-Installation. The project schedule determines the start of the manufacturing process at GE Healthcare for your new X-Ray System.
Construction

The construction at your site is managed by your design and construction team. If you are using the Design-Build method, you will most likely have a project manager and superintendent managing all aspects of the project.

If you are using the Design-Bid-Build approach, you will probably have a separate contact for the design and construction aspects of the project and will need someone to manage the interaction between them.

Construction related items to remember:

- Review the Site Readiness Assessment checklist to monitor progress
- GE Healthcare Project Manager-Installation is available for Q&A
- Project complexity influences schedule times and risk
- Inform the GE Healthcare Project Manager-Installation on design changes relative to the X-Ray System and associated Equipment
- Confirm Equipment delivery route
- Coordinate installation of Broadband (high-speed) Internet connection
- Testing and/or inspections of cable routing methods
- Floor levelness is critical

Project schedule related items to remember:

- Provide critical status updates to GE Healthcare Project Manager-Installation
- Governmental Inspections (permits, department of health, etc.)
- Ensure completion date, and focus on Exam, Equipment, and Control Rooms

Contact your GE Healthcare Project Manager-Installation when issues or changes in the design, floor plan, or project schedule occur.
X-Ray Planning Considerations

<table>
<thead>
<tr>
<th>Contractor</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Make sure that your HVAC systems have been inspected and will support the new heat loads</td>
<td>• Coordinate network, broadband and phone line installation and activation (prefer completion during equipment installation)</td>
</tr>
<tr>
<td>• The equipment can not be delivered until the following items are operational - Phone line, MDP/480 volt power</td>
<td>• Customer supplies the MDP</td>
</tr>
<tr>
<td>• Order long lead items early — HVAC, lighting, Lead glass window</td>
<td>• When doing an upgrade, evaluating the UPS power requirements, structural ceiling support is needed</td>
</tr>
<tr>
<td>• The ceiling structural support is level and meets requirements listed in pre-installation manual</td>
<td>• During X-Ray Upgrades, components from the old X-Ray system should be kept on-site until the upgrade is complete.</td>
</tr>
<tr>
<td></td>
<td>• Customer must have a way of securing the site (PC’s and Monitors sometimes walk)</td>
</tr>
</tbody>
</table>

This list is intended to be a helpful tool based on past experience. Please take the time to review your GE Healthcare drawings with your construction team and GE Healthcare Project Manager-Installation to make sure that everything with your project has been addressed.
Structural Floor/Ceiling

Most X-Ray systems have equipment specific structural ceiling requirements. Specifications on these requirements are given in the Pre-Installation Manual (PIM). You must select a structural engineer to review and advise the contractor on how to build to these specifications. Please confirm with the building contractor on actual schedule cycle time for completion. To comply with site readiness the ceiling support and rail supports must be installed prior to shipment of the X-ray system.

Refer to the GEHC Pre-Installation Manual for requirements on the design criteria.

3-Rail Structural Ceiling Support

Universal Ceiling Grid Support – Must be 26" (+/- 1/16") on Center
Power and Grounding

The X-Ray System requires that electrical raceways, trays, conduits and/or access flooring be installed for the cables that interconnect the various system components.

The GE Healthcare Installation Drawings for your site will show a diagram of these interconnects. The interconnect diagram describes the cable lengths provided with the system. The GE Healthcare Pre-Installation Manual gives the minimum plug pulling diameter for each cable and cross-sectional area for cable groups. It is important that this information be considered during the design and layout of the raceway and junction boxes. Alternate solutions should be discussed with your GE Healthcare Project Manager-Installation.

Diagnostic imaging equipment has become increasingly sensitive to power quality and proper electrical grounding. This sensitivity is influenced by the increased speed and complexity of the data acquisition computers. In order to assure optimal system performance and avoid issues related to image quality and reliability it is extremely important to meet the power requirements of the diagnostic imaging equipment.

The wire size of the power feeder conductors must be carefully determined by your electrical engineer to ensure that the GE Healthcare Equipment will operate as designed. The GE Healthcare Installation Drawings contain a feeder table chart listing the recommended wire sizes for each of the conductors. The wire sizes listed may exceed the National Electrical Code (NEC) requirements, however, the sizes in the chart must be followed to ensure that an unacceptable level of impedance is avoided.

There are often other questions regarding the following list of critical design elements during the Design and Construction phases of the process. Although this is not a comprehensive list of all potential items, your electrical engineer and electrical contractor will need to focus on these.

- Design to meet current version of the NEC for your location
- Proper grounding materials along the ground path
- Proper ground and neutral bonding
- Size of ground wire
- Ground and circuit conductors run in the same conduit
- Single ground in the facility
- Ensure that wire termination connections are tight
- Ensure wires are terminated properly
Mechanical / Electrical Infrastructure

Your X-Ray System has specific power and HVAC requirements. Specifications are given in the GE Healthcare Pre-Installation Manuals (PIM) for power supply, HVAC. These services must be available and operational at the time of Equipment delivery.

Procurement and installation lead time average is 10 weeks. Your GE Healthcare Project Manager-Installation can assist with interpretation of requirements and contacts for equipment sources.
Gallery of Site Readiness Pictures

Unacceptable Site Readiness
Unfinished walls/electrical/lighting etc.

Acceptable Site Readiness
Exam room walls finished. MDC, Lighting & Ceiling Support installed
Broadband and Network Connectivity

“GE Healthcare Remote Services Broadband”
EQUALS
A Secure Virtual Private Network (VPN)
Over Your High-Speed Internet Connection

Broadband Highlights

- High productivity, decreased costly downtime
- Proactively addresses security
  - Customer controlled and auditable
  - Secure encrypted transactions
- Improved speed and reliability vs. modem
- Single Point Access – reduce telecom costs
- All IP-based products are compatible
- Virtual applications assistance and training
- Remote diagnosis

Your GE Healthcare Project Manager-Installation can start you on the path to Broadband. You will need to provide the name of your facility Information Technology contact person to your GE Healthcare Project Manager-Installation. This will initiate the GE Healthcare Headquarters process to assist you in getting ready for Broadband connectivity at the time of System delivery.

Acceptable Site Readiness
Control room walls finished,
Broadband Connectivity available,
Lead Glass Window & Counter Top
(If needed)
Summaries of X-Ray System Items

This section contains Summaries of Critical Items, which are provided to give a high level summary of X-Ray specific items to you and your design and construction teams.

Your site specific plan and design also requires the use of the full set of planning information and specifications found in the GE Healthcare Pre-Installation Manual (PIM) and Final Installation Drawings for your X-Ray System.

Please contact your GE Healthcare Project Manager-Installation if you have not yet received a copy of the Pre-Installation Manual (PIM) or you can view and download the PIM electronically via this link:

http://www.gehealthcare.com/education/tip/index.html

Definium 5000

Definium 8000
Precision 500d
View of Head End of Exam Room

Precision 500d
View of Foot End of Exam Room
X-Ray Construction Considerations

This section is intended to point out key areas that could affect image quality.

Things to review:

See pre-installation manual for specific requirements regarding:
- Light Fixtures
- Sprinkler Heads
- HVAC returns
- Warning lights/door switch
Site Readiness Assessment

The Assessment checklists at the end of this Guide need to be used by your project manager and your GE Healthcare Project Manager-Installation to determine if your site is ready for delivery of your X-Ray Equipment. It is your project manager’s responsibility to maintain the project schedule and communicate any changes.

These checklists are provided to give a summary of X-Ray specific items for you and your design and construction teams. GE Healthcare recommends using the Assessment checklist for guidance in planning your design and monitoring your build effort.

A comprehensive Pre-Installation Checklist is found in the GE Healthcare Pre-Installation Manual (PIM) and the Final Installation Drawings.

You can view and download the latest version of the GE Healthcare Pre-Installation Manual electronically via this link:

http://www.gehealthcare.com/company/docs/siteplanning.html

Failure to provide any of the items by the agreed upon date(s) for the Equipment delivery MAY result in:

- The inability to deliver the Equipment on the requested date
- Storage and re-delivery fees for the Equipment (at customer expense)
- Delay in equipment installation
- Rework or re-scheduling of contractors
- Delay in system availability for patient exams and earning revenue

Thank you for your diligence in making sure the Assessment checklist is complete on time. Contact your GE Healthcare Project Manager-Installation with questions.
Basic Install Process

Site Ready for Delivery

System Receiving

Mechanical Installation

System Calibration
Site Ready for Delivery!

The Site Readiness for the X-Ray System delivery is coordinated between you, your contractor and your GE Healthcare Project Manager-Installation. Use the Site Readiness Assessment checklist, located in the Assessment List section of this Guide, to monitor Site Readiness. You and your contractor need to confirm the Site Readiness schedule no later than 2 weeks prior to your X-Ray System delivery. The GE Healthcare manufacturing department requires this confirmation to coordinate the manufacturing integration and shipment of the System.

The GE Healthcare Pre-Installation Manual contains a comprehensive, X-Ray System specific Pre-Installation Checklist.

GE Healthcare needs the following information from you:
- Agreement on final Equipment delivery dates
- Completed Site Readiness Assessment
- Adherence to the scheduled delivery dates; focus on Exam, Equipment and Control Rooms for completion

Contact your GE Healthcare Project Manager-Installation concerning issues.
X-Ray System Delivery

The X-Ray System’s Equipment delivery includes all of the X-Ray System equipment/electronics for the Exam Equipment Room and/or Control Room. This delivery is coordinated between you, your contractor and your GE Healthcare Project Manager-Installation. There are other preparations beyond Site Readiness that are coordinated by your GE Healthcare Project Manager-Installation, that include:

- Clearing of delivery pathways
- Identifying space for staging the delivered Equipment
- Receipt and Sign-off of shipment
- Obtain any required delivery permits or street use permits

Contact your GE Healthcare Project Manager-Installation concerning issues.
Assessment for Equipment Delivery

The following is an Assessment checklist of critical items that must be accomplished prior to the delivery of your new GE Healthcare X-Ray Equipment:

Note: This Assessment Checklist is available in the Assessment List section at the end of the document

- Room construction must be complete with primer paint and must be dust free
- Ceilings and lighting fixtures installed and operational
- Permanent power and lighting for the entire suite is installed and operating (24x7)
- Network lines are installed and ready
- Broadband Internet connection operational
- HVAC systems installed and operational
- Environmental conditions meet specification per the GE Healthcare Pre-Installation Manual
- Conduits, ducts, ladder trays and/or raceways for System cables installed in Exam/Equipment and Control Rooms
- Perform required local inspections

Site must be secure so Equipment and personnel will be safe
Equipment Delivery

Below is the flow of events prior to and during equipment delivery.

**Equipment Delivery Logistics Plan Complete**
- Responsible parties: GE Project Manager-Installation/Customer

**Pathway of Equipment Delivery Cleared**
- Responsible parties: Customer/Contractor

**Access Control for Delivery in Place**
- Responsible parties: Customer/Contractor

**Equipment Delivery Date Confirmed**
- Responsible parties: GE Project Manager-Installation/Customer

**Control/Equipment/Exam Room Site Readiness Complete (Assessment Checklist)**
- Responsible parties: Customer/Contractor/Project Manager-Installation

**GE Install Team Arrives**
- Responsible parties: GE Installer

**Equipment Arrives**
- Responsible parties: GE Carrier

**Unload and Inventory the Shipment**
- Responsible parties: GE Carrier

**Move Carts and Equipment to Rooms**
- Responsible parties: GE Service Engineer/Customer

**Begin Equipment Installation**
- Responsible parties: GE Installer

Event

**Related Events**
- Responsible parties: GE Project Manager-Installation/Customer
- Responsible parties: Customer/Contractor
- Responsible parties: Customer/Contractor/Project Manager-Installation
- Responsible parties: GE Installer
- Responsible parties: GE Carrier
Equipment Delivery

LEAN Cable Cart (If applicable)

Equipment Delivery
Safety Awareness

Safety

Putting people first
• The GE Healthcare lockout/tagout (LOTO) program is essential to safe service.
• LOTO protects our technicians and your personnel against electrical shock.
• Read about the LOTO program. If you have questions, call 800-321-7937. (option 4)

Backup Information

GE Healthcare Lockout/Tagout Procedures

When we install, service or maintain your imaging equipment, the safety of your staff and our people is paramount. We follow strict lockout/tagout (LOTO) procedures to make sure no one is injured while we work on your devices. LOTO is a basic and mandatory safety procedure. Lockout means isolating the equipment from its power source so that it cannot be turned on while a technician is working on it. A switch or circuit breaker is locked in the OFF position until servicing is complete. Tagout, an extra precaution, means placing a warning tag on the switch saying that the equipment is being serviced and may not be operated until the tag is removed.

When our people are servicing your equipment, we may use the GE Healthcare LOTO program. During service, we lock the equipment service disconnects with a red lock and tag. If the service employee leaves the site but the equipment is not ready to return to operation, we use a yellow lock and tag. In cases where LOTO cannot be applied (such as during some troubleshooting), our personnel may ask for your site Arc Flash study for the equipment being serviced. This is related to the NFPA70E regulation dealing with arc flash safety around electrical panels. We follow the LOTO program at all sites where GE Healthcare personnel service, install or maintain medical equipment. If you require that we use your site-specific LOTO program, please provide a copy to the GE Healthcare Field Service Environmental, Health and Safety (EHS) Group for review. Before we service your equipment, we want to make sure that your program provides at least the same protection as or own.

Your GE Healthcare Field Service Engineer will be glad to review our LOTO program with you to make sure you understand it.

If you have any questions, please contact the Field Service EHS Group at 800-321-7937, option 4.
Installation and Calibration

Once the Equipment arrive at your site, a team of GE Healthcare Installers arrive to install and connect the System components. A GE Healthcare Service Engineer is assigned to calibrate and test your X-Ray System to GE Healthcare specifications.

Your Broadband (high-speed Internet) service needs to be operational before calibration activity begins. This enables the enhanced diagnostic and applications support capabilities for your System and its’ operations.

Schedule any applicable acceptance testing by your team to immediately follow the System Calibration and testing phase. If you require in-house testing of the System, make sure you wait to schedule applications training until you complete the in-house testing phase. Coordinate the testing schedule with your GE Healthcare Project Manager-Installation and GE Healthcare Service Engineer, to prevent delays and last minute cancellations.

Customers who plan and allow for the recommended time to train X-Ray technicians and Radiologists have the highest satisfaction and efficiency in the use of their new System. Your teams’ level of engagement and dedication to the training process plays a role in the use of your new System.

All of our TiP offerings provide Continuing Education (CE) credits to your staff, if they follow the recommended training curriculum. These offerings will optimize image quality and improve productivity. For more information on TiP Applications, please visit:

http://www.gehealthcare.com/usen/education/index.html

Application Training and First Patient

GE Healthcare TiP “Training in Partnership” clinical Applications training offerings enable you to optimize your GE Healthcare equipment at its highest performance. You will be contacted by the TiP Applications team to set up your training.

Multiple Training Choices are designed in the TiP program and can be obtained from your GE Healthcare sales person. The “Partnership” is your level of engagement in the training process along with GE Healthcare commitment to training.

Now you are ready to scan patients!
TiP Application Training

Staff Instruction That Pays Dividends For Years

- Applications training helps you get the most from your imaging system.
- GE Healthcare offers training options to fit your needs and budget.
- Effective training depends on a mutual commitment

<table>
<thead>
<tr>
<th>What You Expect of Us</th>
<th>What We Ask of You</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tailor training to your needs</td>
<td>Select the appropriate programs for your staff</td>
</tr>
<tr>
<td>Offer a complete training curriculum</td>
<td>Set expectations and goals before training</td>
</tr>
<tr>
<td>Supply a training preparation guide</td>
<td>Prepare for training based on the curriculum guide</td>
</tr>
<tr>
<td>Provide expert instructors</td>
<td>Keep training time focused -- free of interruptions</td>
</tr>
<tr>
<td>Train staff to your desired level</td>
<td>Be sure staff members complete assessments</td>
</tr>
<tr>
<td>Provide Continuing Education</td>
<td>Monitor progress; review results with your trainer</td>
</tr>
<tr>
<td>Guarantee results</td>
<td>Continue training staff to higher skill levels</td>
</tr>
<tr>
<td>Select the appropriate programs for your staff</td>
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</tbody>
</table>

Backup information

A Wide Range of Training Options

Your new imaging system has superb diagnostic power. When your people apply its full capabilities, patients get better care. Training in Partnership (TiP) applications training, widely recognized for its educational value, helps your staff to use your equipment with the maximum skill and efficiency. Our programs are approved for continuing education credit through the ASRT and SNM.

Training is a partnership. Your people should prepare to be full participants, devoting their time free of distractions or interruptions. Every hour of focused instruction will reward you manyfold for years to come. Here is a summary of the TiP Applications Training programs available from GE Healthcare. Course descriptions and testing are available at:

X-ray Quickstart Installation Guide

Application Details

**TiP Application Training**

**TiP Applications HQ Training**
Interactive, distraction-free training at the GE Healthcare Institute in Waukesha, Wis.

**TiP Applications On-site Training**
Hands-on instruction at your facility.

**TiP Applications TVA Training**
Cost-effective instruction on your equipment, delivered via distance learning.

**TiP Education Solutions**
Specialized training and consulting programs designed to help you quickly and efficiently refine staff skills, optimize image quality and streamline workflow in your imaging department.

**TiP TV and TiP On-Demand**
Award-winning programs as satellite broadcasts or online courses.

**The Patient Channel**
Essential health information available to patients in your facility.

**TiP Applications HQ Training**
The TiP HQ Training program gives technologists and physicians classroom-based instruction at the GE Healthcare Institute in Waukesha, Wis. Lectures combined with hands-on, instructor-led practice sessions prepare staff for new system installations, enhance modality knowledge, and fine-tune skills to optimize clinical and technical capability. The controlled environment, free of distractions and interruptions, promotes accelerated learning. Programs available for all imaging modalities cover imaging systems and software, the AW workstation, and basic to advanced system operation (Level 1 and Level 2).

**TiP Applications On-site Training**
The Onsite Training program gives technologists and physicians the convenience of training on your system in their own work environment. A GE Healthcare expert delivers in-depth instruction that combines lecture with hands-on, instructor-led practice sessions that reinforce advanced or complex procedures. This personalized training addresses your unique needs. The program includes protocol optimization and image-quality critique. You can use the training to prepare staff for new system installations, enhance modality knowledge, and fine-tune skills to optimize clinical and technical capability. Training outcomes are measured by a unique testing and skill assessment program delivered online as part of the TiP On-site Training and education curriculum. Your TiP Applications Specialist will contact you to schedule training. Technologists and radiologists should plan to focus all their energy on the program -- you should modify the patient schedule to allow their full participation.
TiP Application Training

TiP Applications TVA Training

TiP Virtual Assist (TVA) revolutionizes applications training, combining the hands-on benefits of on-site training with the cost savings and convenience of distance learning. Your staff takes part in live, interactive sessions, using your equipment console, led by a GE Healthcare specialist connected by a high-speed, broadband link. The instructor and your staff share control of the console and communicate by telephone. The GE Healthcare specialist can demonstrate a procedure, moving the cursor and clicking on software keys to walk participants through the process steps. Trainees then can take control of the console and practice the steps while the trainer observes. Radiologists and technologists feel as if their trainer is actually there in person. TVA lets you schedule training in small increments and work around staff schedules. Before the session, you receive a curriculum that includes a list of trainee prerequisites, a course description, measurable objectives, and a schedule. Afterward, each participant completes an online skill inventory.

TiP Education Solutions

Special programs designed to help you get the full benefit of your diagnostic equipment. Whether you are a new GE Healthcare customer getting acquainted with your equipment, an experienced customer seeking to optimize advanced clinical procedures, or looking for a solution to help you maintain your staff's technical skills over the life cycle of your equipment, we offer a program to meet your needs.

TiP Succeed Elite

A comprehensive program designed for customers who are new to GE Healthcare equipment or for current GE Healthcare customers who are making a significant technology leap. This program is recommended for facilities with a large staff or those wishing to ramp-up quickly on advanced technology.

TiP Succeed Advance

Designed to enhance skills of experienced GE Healthcare users. Training targets the new system technology to promote optimal clinical performance.

TiP Training Choices

Offers flexible training options for your facility. Designed to refresh staff skills on existing equipment or to support the purchase of an additional GE Healthcare system of like configuration.

TiP Extended Training

Designed to keep your staff's skills at their peak over the life of your cycle of your system. Programs are scalable to suit your needs.

Each TiP training program includes its own specialized combination of, on-site training, TiP Clinical Education Classes, TiP Virtual Assist (TVA), clinical skills analysis and other components to deliver the right educational solution for your needs.
TiP Application Training

TiP-TV and TiP OnDemand
Established in 1991, TiP-TV is the world’s largest and fastest-growing satellite training network for healthcare professionals. Diagnostic imaging training programs are available as satellite broadcasts or as on-demand online courses for physicians, nurses, imaging technologists, pharmacists and others in more than 40 clinical specialties. These award-winning programs provide a time and cost efficient way for your staff to stay at the forefront of imaging technology. Your people learn from world-recognized healthcare experts without having to leave your facility. In addition to programs developed by GE Healthcare, we offer accredited programs from prestigious medical organizations, including Duke Clinical Research Institute, Mayo Clinic, the American Heart Association, Children’s Hospital Boston, and Clinical Medicine Today.

Offerings also include multi-modality diagnostic imaging program schedules in a cluster format -- back-to-back programs examining the use of different modalities for common disease states. The programs are broadcasted via satellite during weekdays, evenings and weekends. Clusters cover cancer/oncology, cardiac/vascular, neurology, and other topics. More than 95 percent of TiP-TV programs qualify for continuing education credit. You can learn more about TiP-TV and review a course list and schedule by visiting the web site at: http://www.gehealthcare.com/usen/education/sat_edu/products/onlinecourses.html

The Patient Channel
Patients in the hospital have time to watch television -- and so do friends and family who visit. The Patient Channel, offered by GE Healthcare in partnership with NBC, helps them use that time to learn how to get and stay healthy. Available around the clock in patient rooms and waiting areas, The Patient Channel delivers more than 40 educational programs per week, providing high-quality information at an ideal “teaching moment.” Your clinicians can prescribe programs specific to patients’ disease states. GE Healthcare founded The Patient Channel in 2002 to help hospital staff deliver reliable, accurate information in forms that patients can easily understand. The content is accurate, valid, current, and free from outside influence.

Before airing, every program is reviewed by medical authorities to assure that the information meets the highest standards. Programs replay often so that patients can view them at convenient times. Programs covers a wide spectrum of topics including heart disease, diabetes, high blood pressure, arthritis, cancer, asthma, smoking cessation, parenting, and health and wellness. The content is meant to stimulate communication with healthcare providers, improve patients’ ability to make informed decisions, and promote a sense of empowerment. Program schedules and more information about The Patient Channel are available at: www.thepatientchannel.com
Close Out Meeting

**Purpose:**
To ensure that all customer expectations have been met and that any open items are closed out.

**Mandatory Attendees:**
- Customer Team
  - Dir of Radiology, HIS, Networking, Modality Supervisor,
  - Medical Director
- GE Healthcare – Sales, PMI (Project Manager of Installation),
  - Director of Service, Applications Specialist

**Pre-Requisites:**
- Install complete
- Applications complete
- Image Quality / Performance
- How To Contact GE Healthcare
- Serial number of system
- Unused applications days
- SPT reviewed / performed with customer

**Agenda topics:**
- Customer expectations met
- Contact information review
- Escalation process
- Future service level / programs
- Review warranty acceptance
# GE Healthcare Site Ready Checklist

**GE Healthcare Site Readiness Checklist**

<table>
<thead>
<tr>
<th>Item #</th>
<th>GEHC Minimum Requirements</th>
<th>Storage:</th>
<th>Predict (Pre-ship):</th>
<th>Verify (Delivery):</th>
<th>Validate (Mech Install):</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Equipment installation drawings must match actual room size, equipment placement and meet clearance requirements. Deviations that meet installation requirements may be red-lined, if allowed by local code. Seismic requirements identified on construction drawings. In the following states: NC, SC, AR, DC, WA, WI - Verify State approved shielding plans match GE drawing room dimensions and equipment placement.</td>
<td>Is this item ready?</td>
<td>Will item be ready?</td>
<td>Is item delivery ready?</td>
<td>Is item ready?</td>
<td>If &quot;N&quot;, please enter in comments or action plan</td>
</tr>
<tr>
<td>2</td>
<td>Delivery route to installation or storage area meets requirements and has been discussed and scheduled with the customer. Ensure floor protection is discussed, requirements identified, and will be available at time of delivery and installation.</td>
<td></td>
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<tr>
<td>3</td>
<td>Rooms that will contain equipment, including storage areas-not in scan suite, are dust free. Provisions taken to maintain a dust free room. Room security to prevent unauthorized access and theft has been discussed with customer. The customer is aware of these security issues, implications and responsibility.</td>
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<tr>
<td>4</td>
<td>In room HVAC ductwork and units (in room) must be mechanically installed and dust free. Installation rooms appear to meet environmental conditions (see Further Definitions) and observed issues have been communicated to the customer. If being stored, storage area-not in scan suite, must meet PIM storage criteria.</td>
<td></td>
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<tr>
<td>5</td>
<td>Ceiling grid is installed, Unistrut is located per the installation drawings, and permanent lighting is installed and operational.</td>
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<tr>
<td>6</td>
<td>Floor is clean and prepared for final floor covering. Customer has verified floor leveling meets the equipment installation drawings and PIM specs and no visible defects are observed. Gantry and table baseplate are installed prior to delivery if applicable.</td>
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<tr>
<td>7</td>
<td>Access to a working phone at the facility for emergency use, including MR magnet delivery.</td>
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<tr>
<td>8</td>
<td>All walls primed (final coat not needed on Day 1)</td>
<td></td>
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<tr>
<td>9</td>
<td>Mechanical supplier has been provided with a set of equipment installation drawings for reference. For California, permitted construction drawings or PIM-specified installation drawings are required.</td>
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<tr>
<td>10</td>
<td>Conduit/electrical cable ducting/dividers/access flooring installed, with the exception of surface-mounted floor ducting. Wiring to the main disconnect panel is installed and compliant with equipment installation drawings or pre-installation manual.</td>
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</tbody>
</table>

**For MR Magnet Delivery**: Ensure oxygen vents, power for the cooling system and exhaust fan system are installed and operational (0.7T, 1.5T & 3T) and chilled water supply is available (24/7) that meets system cooling equipment requirements.

**Issued Date**: 5/1/08 Rev 15  DOC0422752  GEHC Only: COE # (888) 799.7266  Option 5 (PMI Support)
Site Readiness Assessment for Equipment Delivery

Critical items to be completed before delivery

Check when complete

- Main Disconnect Panel (MDP) installed, power connected and available 24x7
- Proper Ceiling Structural Support Installed to match Requirements in PIM
- Personnel phone line and phone installed and operational
- Broadband (high-speed) Internet connection operational
- Perform required local inspections
- Equipment & Control Room construction complete with primer paint and dust free
- HVAC installed and operational for Equipment & Control Room at a minimum
- Conduits raceways installed

For detailed description of requirements for each item, refer to the GE Healthcare Pre-Installation Manual for your product.
Site Readiness Assessment for Equipment Delivery (Continued)

Critical items to be completed before delivery

Check when complete

☐ Ceiling and lighting fixtures installed

☐ Permanent power and lighting installed and operating

☐ Perform required local inspections

For detailed description of requirements for each item, refer to the GE Healthcare Pre-Installation Manual for your product.
### Terminology/Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>A/E</td>
<td>Architect and Engineer</td>
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<tr>
<td>AIA</td>
<td>American Institute of Architects</td>
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<tr>
<td>AW</td>
<td>Advantage Windows OR Analysis Workstation</td>
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<tr>
<td>AutoCAD</td>
<td>Computer program to create drawings</td>
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<tr>
<td>CON</td>
<td>Certificate of Need</td>
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<tr>
<td>D-B</td>
<td>Design-Build</td>
</tr>
<tr>
<td>D-B-B</td>
<td>Design-Bid-Build</td>
</tr>
<tr>
<td>Guide</td>
<td>X-ray Quickstart Installation Guide</td>
</tr>
<tr>
<td>HVAC</td>
<td>Heating, Ventilation and Air Conditioning</td>
</tr>
<tr>
<td>IP</td>
<td>Internet Protocol</td>
</tr>
<tr>
<td>NEC</td>
<td>National Electrical Code</td>
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<tr>
<td>PACS</td>
<td>Picture and Archiving Communications System</td>
</tr>
<tr>
<td>PIM</td>
<td>Pre-Installation Manual</td>
</tr>
<tr>
<td>PMI</td>
<td>Project Manager-Installation</td>
</tr>
<tr>
<td>Q&amp;A</td>
<td>Questions and Answers</td>
</tr>
<tr>
<td>System</td>
<td>Scanner and all accompanying electronics</td>
</tr>
<tr>
<td>TiP</td>
<td>Training in Partnership</td>
</tr>
<tr>
<td>UPS</td>
<td>Uninterruptible Power Supply</td>
</tr>
<tr>
<td>VPN</td>
<td>Virtual Private Network</td>
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</tbody>
</table>
Healthcare Re-imagined

GE is dedicated to helping you transform healthcare delivery by driving critical breakthroughs in biology and technology. Our expertise in medical imaging and information technologies, medical diagnostics, patient monitoring systems, drug discovery, and biopharmaceutical manufacturing technologies is enabling healthcare professionals around the world to discover new ways to predict, diagnose and treat disease earlier. We call this model of care “Early Health.” The goal: to help clinicians detect disease earlier, access more information and intervene earlier with more targeted treatments, so they can help their patients live their lives to the fullest. Re-think, Re-discover, Re-invent, Re-imagine.

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