APPENDIX G. DIAGNOSTIC IMAGING AND THERAPEUTIC EQUIPMENT

G-1. Introduction This appendix explains documents associated with the acquisition and acceptance of diagnostic imaging and radiation therapy equipment. It also provides a detailed explanation of the responsibilities and procedures involved in the acceptance of diagnostic imaging equipment acquired through contracts administered by the Defense Supply Center Philadelphia (DSCP).

G-2. Contents Reproducible copies of documents for use in preparing Medical Care Support Equipment (MEDCASE) Program Requirements (MPRs) may be obtained from the USAMMA.

G-3. Diagnostic Imaging Acceptance

a. GENERAL. Upon completion of installation, the vendor is required to notify DSCP or VA contracting office, in writing that the system is ready for acceptance inspection. The inspection must occur within 30 days following the DPSC receipt of the notification. Initial or first-time inspection costs are at government expense.

b. USAMMA X-RAY ACCEPTANCE PROGRAM**.** X-ray acceptance inspections are performed by one of the following methods.

(1) CONUS. DSCP notifies the Maintenance and Engineering Division of USAMMA that the system is ready for acceptance testing. Technicians from the using organization or one of USAMMA's medical equipment repair activities (Tobyhanna, PA, or Ogden, UT) are assigned to perform the tests. Results of the acceptance testing are forwarded to the contracting officer at DSCP for decision. An electronic or printed copy of the acceptance test document is provided to the activity by the USAMMA representative. The acceptance test information is to be retained by the customer, who is responsible for maintaining it on file.

(2) OCONUS. DSCP notifies the USAMMA that the system is ready for acceptance testing. The Medical Maintenance Operations Division notifies the appropriate OCONUS maintenance activity by message, who conducts the tests.

(3) Local Acceptance. Certain types of diagnostic imaging systems, such as mobile radiographic or fluoroscopic units, dental x-ray systems, conventional radiographic or fluoroscopic systems, or other systems which do not require extensive testing may be inspected locally by Biomedical Equipment Maintenance personnel. Local inspection is dependent upon the availability of qualified personnel and the necessary Test, Measurement and Diagnostic Equipment (TMDE).

c. ACCEPTANCE TEST FAILURE. The failure of an x-ray system to meet acceptance test protocols is a determination that may be made only by the contracting officer. Once the vendor has been notified with rejection letter, he is required to reimburse the government for all expenses related to the re-inspection.

G-4. Facility Survey Report (FSR)

a. PURPOSE. The FSR is used in lieu of the Pre-Acquisition Site Survey (PASS) for diagnostic imaging/therapeutic radiation equipment which is to be installed in a new or renovated facility (BLIC "MB" requirement). It is used by DSCP to insure that a system is acquired which will successfully interface with the proposed facility.

b. USE. A completed FSR must be submitted with the DA Forms 5027-R/5028-R for a BLIC "MB" diagnostic imaging or therapeutic radiation requirement.

c. EXAMPLE. A blank FSR, for local reproduction, may be obtained by contacting the USAMMA at:

U.S. Army Medical Materiel Agency
ATTN: MCMR-MMT-C
1423 Sultan Dr., Suite 100
Fort Detrick MD 21702-5001
301-619-7403/DSN 343-7403

G-5. Radiology Pre-Acquisition Site Survey (PASS)

a. PURPOSE. This survey should ensure site readiness for installation of a radiology system. It indicates that planning for equipment installation has begun. Site readiness and equipment delivery must be closely coordinated.

b. APPLICABILITY. Site surveys are required for all radiology/diagnostic imaging systems (IDCs 3000-3499) where installation and room preparation are required. Portable units do not required a PASS.

c. WHEN SUBMITTED. The PASS must be submitted to the USAMMA with the MEDCASE Program Requirement (MPR) package. The PASS should also be provided to the contractor during his site review after contract award.

d. PREPARATION. PASS should contain input from the Chief of Biomedical Maintenance and the Facilities Engineer. Basic points for these individuals to consider are:

(1) Electrical Power. Is the existing power supply adequate for the type of system being planned? If not, what modifications are required? Indicate proposed specifications for the modified electrical distribution system.

(a) X-ray System: Maximum peak tube potential (kVp); maximum rated tube current (mA); maximum power (kVa) demand; required percent voltage regulation for operation without derating; maximum line current.

(b) Existing or Required Electrical Supply: Voltage; phase; frequency; range of voltage variations; number of voltage transients per hour under 2 percent of supply voltage; number of voltage transients per hour in excess of 2 percent of supply voltage.

(c) Distribution Transformer: kVa; voltage regulation at rated load (0.95 power factor); predicted voltage regulation at x-ray system maximum demand (if more than one x-ray system is served by the same transformer; also calculate regulation during simultaneous operation of the two largest x-ray systems at maximum capacity); wye or delta configuration (three-phase only).

(d) Secondary Feeder: Length in feet (meters) from transformer to disconnect in x-ray control booth; phase, neutral and ground wire sizes; calculated percent voltage regulation in secondary feeder during x-ray system maximum demand (if part of the feeder supplies branches to other x-ray systems, also calculate percent voltage regulation during simultaneous operation of the largest x-ray system other than that being planned).

(e) Percent voltage regulation at x-ray system (totals from single system operation and, if applicable, simultaneous operation).

(f) Disconnect(s): Type (circuit breaker or fused safety switch); ratings of switches; circuit breakers and/or fuses.

(g) Auxiliary Power Requirements: voltage, phase, frequency, amperage.

(h) Grounding Requirements: See the National Electric Code (NFPA 70 Article 517-51(c)).

(i) Emergency Power: If operation of the proposed generator will be necessary during periods when emergency power is used, emergency generator specifications should be identified to include voltage, phase, frequency, available kVa and type (wye or delta) or output (see IM 5-838-2).

(j) Existing Conduit: The location of existing electrical conduit and utility connections should be determined and indicated in a room drawing with the survey. This information will be helpful in determining the amount of new conduit that must be urn and the amount of existing conduit that can be used. Maximizing use of existing conduit where possible will obviously accelerate installation.

(k) Single-phase Equipment versus Three-phase Power: It is not necessary to replace an incoming three-phase power line, if single-phase equipment is being installed, provided that amp capacity is sufficient on the line. However, an additional three-phase to single-phase transformer will be required. This can be ordered with the radiology system if the requirement is identified prior to contract.

(l) Microprocessor Power Requirements: Microprocessors are often used as components to radiology and diagnostic imaging equipment. The use of these devised requires stable power. This can be achieved with a constant voltage output transformer. This can be ordered with the system if identified and required. The requirement for stable line regulation must be stated on the PASS and the COL when stable line voltage requirements are needed.

(2) Other Utilities. Some x-ray systems require other utilities in addition to the electrical service. For example, certain spot-film devices use compressed air for cassette transport mechanisms. All utility requirements should be identified in the pre-acquisition site survey. Consult the Department of Public Works (DPW) personnel when assistance is required.

(3) Lighting. Depending on the type of tube hanger to be utilized, some x-ray facilities may require relocation of recessed overhead fluorescent lighting fixtures. In addition, the department chief may require controls on the spot-film device which enable them to dim or extinguish the overhead lights. Include all specifications for lighting relocation and wiring adjustment in the pre-procurement site survey. Consult DFAE when assistance is required.

(4) Overhead Hangers. If the proposed system requires overhead support, identify existing and proposed methods for attachment of the tube rails and other accessories. For new systems, use a gridded hanger system to reduce installation costs.

(5) Floor Plans.

(a) Provide a line drawing illustrating (at a minimum) the floor plan of the room and the proposed location of the following components:

- x-ray control
- high-voltage generator
- table or cradle
- wall-mounted cassette holders and/or
- other large components occupying significant floor space

The recommended scale for floor plans is ½ inch = 1 foot or metric equivalent as required, provided the scale is annotated on the drawing. When necessary, use additional drawings to illustrate important construction modifications which will be required. Allow space for a wheeled litter to be rolled next to the x-ray table.

(b) Locate tables and wall-mounted cassette holders to permit necessary vertical, longitudinal, and lateral movement of the over table tube housing assembly in relation to them. As discussed above, existing conduit should be indicated on the drawing along with any new conduit that may be received. All room design shall be consistent with the radiation safety requirements of *TB MED 521*. Consult the Nuclear Medical Science Officer, Health Physicist, or Radiological Physicist (if one is assigned). If necessary, additional assistance may be obtained from the USAEHA at:

U.S. Army Environmental Hygiene Agency
ATTN: HSE-RH
Aberdeen Proving Ground MD 21010-5422

e. REFERENCES

Manuals that should be on-hand to help with preparation are:

(1) Manufacturer's technical bulletins for all x-ray systems currently installed or to be installed.

(2) TB MED 521*, Management and Control of Diagnostic and Therapeutic X-Ray and Gamma Beam Equipment.*

f. EXAMPLE

A blank PASS, for local reproduction, may be obtained by contacting the USAMMA at:

U.S. Army Medical Materiel Agency
ATTN: MCMR-MMT-C
1423 Sultan Dr., Suite 100
Fort Detrick MD 21702-5001
301-619-7403/DSN 343-7403