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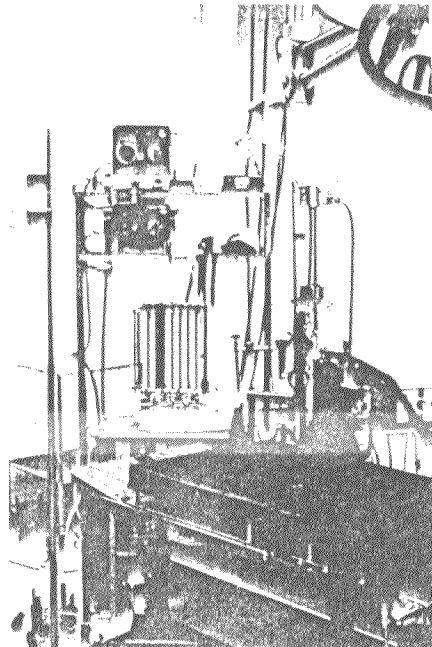


FIGURE 3.108. Example of operating room support equipment

SEISMIC QUALIFICATION APPROACH

- Design team judgment
 - Design for individual pieces of equipment.

REFERENCE FIGURES FOR INSTALLATION DETAILS

- 4.68, 4.69.

RELATIVE DEGREE OF DAMAGE OF INADEQUATELY PROTECTED EQUIPMENT

- Minor to major

MOST LIKELY TYPE OR CONSEQUENCE OF DAMAGE FOR INADEQUATELY PROTECTED EQUIPMENT

- Toppled equipment.
- Runaway equipment.
- Personnel injury possible
- Potentially inoperable equipment
- General cleanup required

Medical Systems

Pharmacy Shelves, Rolling

Rolling pharmacy shelves (Figure 3.109) present a dual problem; that of spilled contents and cabinets slamming back and forth.

EQUIPMENT SEISMIC CATEGORY

- "C" support equipment

SEISMIC SPECIFICATION

- SDS-2.

SEISMIC QUALIFICATION APPROACH

- Design team judgment.
 - Provide retainers for shelved items.
 - Provide guides to keep rolling shelves in their tracks.
 - Keep large bottles and containers on bottom shelves.

REFERENCE FIGURES FOR INSTALLATION DETAILS

- 4.73, 4.74.

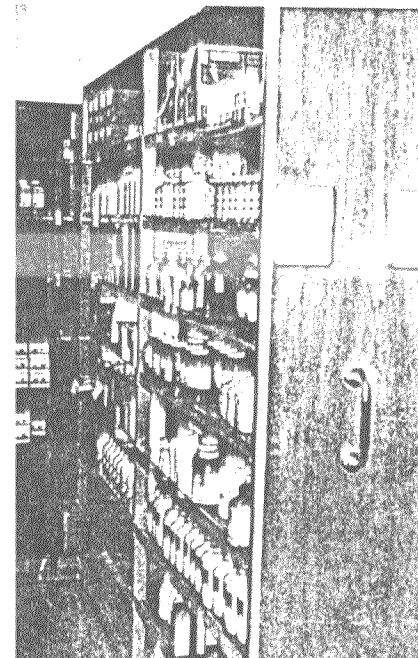


FIGURE 3.109. Rolling pharmacy shelves. Note the Plexiglas shelf parapets.

RELATIVE DEGREE OF DAMAGE OF INADEQUATELY PROTECTED EQUIPMENT

- Minor to moderate.

MOST LIKELY TYPE OR CONSEQUENCE OF DAMAGE FOR INADEQUATELY PROTECTED EQUIPMENT

- Spilled shelf contents
- Broken bottles.
- Potential for toxic spills.
- Units coming out of their tracks.
- General cleanup required

*Medical Systems**Pharmacy Work Stations*

Pharmacy work spaces (Figure 3.110) generally experience spillage of shelf contents during an earthquake

EQUIPMENT SEISMIC CATEGORY

- "C" support equipment.



FIGURE 3.110. A typical pharmacy work space. Note the lack of shelf supports.

SEISMIC SPECIFICATION

- SDS-2.

SEISMIC QUALIFICATION APPROACH

- Design team judgment.
 - Provide shelved item retainers.
 - Provide retainers for counter top equipment such as scales and CRT
- Equivalent static coefficient analysis.
 - Base anchorage of work stations.

REFERENCE FIGURES FOR INSTALLATION DETAILS

- 4.53, 4.54, 4.55, 4.56, 4.57, 4.60, 4.61, 4.62, 4.63, 4.73, 4.76.

RELATIVE DEGREE OF DAMAGE OF INADEQUATELY PROTECTED EQUIPMENT

- Minor to moderate

MOST LIKELY TYPE OR CONSEQUENCE OF DAMAGE FOR INADEQUATELY PROTECTED EQUIPMENT

- Spilled shelf contents
- Broken glass.
- Potential for toxic spills.
- Dislodged counter top items.
- Displaced work counters.

*Medical Systems**Radiological Treatment*

Tall, slender, and eccentrically loaded, this equipment is subject to violent motions during an earthquake if it is not adequately supported (Figure 3.111).

EQUIPMENT SEISMIC CATEGORY

- "C" support equipment.

SEISMIC SPECIFICATION

- SDS-2.

SEISMIC QUALIFICATION APPROACH

- Dynamic analysis.
 - For complex equipment such as that shown above.
- Equivalent static coefficient analysis.
 - For less radical equipment configurations.

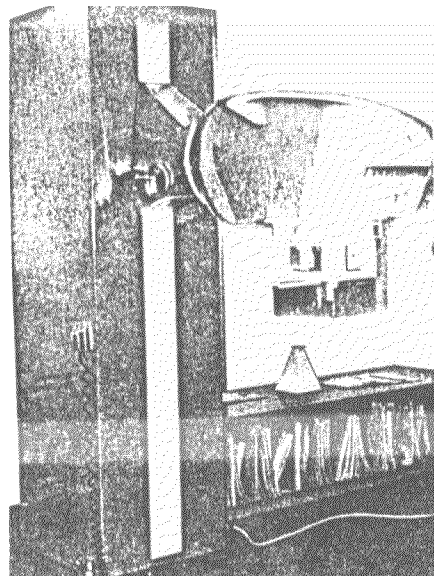


FIGURE 3.111. Large eccentrically loaded cobalt treatment equipment. This unit is base anchored only.

REFERENCE FIGURE FOR INSTALLATION DETAILS

- 4.75.

RELATIVE DEGREE OF DAMAGE OF INADEQUATELY PROTECTED EQUIPMENT

- Minor to moderate.

MOST LIKELY TYPE OR CONSEQUENCE OF DAMAGE FOR INADEQUATELY PROTECTED EQUIPMENT

- Equipment malfunction.
- Pounding of adjacent equipment.
- Toppling due to inadequate anchorage design.
- General cleanup required.

Medical Systems

Radiological Treatment Console

Radiological consoles (Figure 3.112) should be treated similarly to communications consoles. Although not critical equipment, their great expense and difficulty to repair warrants a good seismic qualification program.

EQUIPMENT SEISMIC CATEGORY

- "C" support equipment.

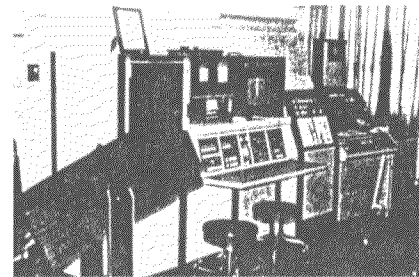


FIGURE 3.112. Unsecured radiological treatment console.

SEISMIC SPECIFICATION

- SDS-2 or SDS-1.

SEISMIC QUALIFICATION APPROACH

- Equivalent static coefficient analysis.
 - SDS-2 for base anchorage.
- Dynamic analysis.
 - SDS-1 for the console subcomponents.
- Seismic test.
 - Manufacturers may wish to consider a generic test program for components sensitive to dynamic motions.

REFERENCE FIGURE FOR INSTALLATION DETAILS

- 4.58.

RELATIVE DEGREE OF DAMAGE OF INADEQUATELY PROTECTED EQUIPMENT

- Minor to major.

MOST LIKELY TYPE OR CONSEQUENCE OF DAMAGE FOR INADEQUATELY PROTECTED EQUIPMENT

- Console displaced.
- Internal component failure.
- Console frame failure.
- Inoperable equipment.
- General cleanup required.

Medical Systems

Respirators

Portable respirators (Figure 3.113) are not necessary for life support but do warrant seismic consideration for reasons such as expense, potential personnel injury, and unnecessary cleanup.

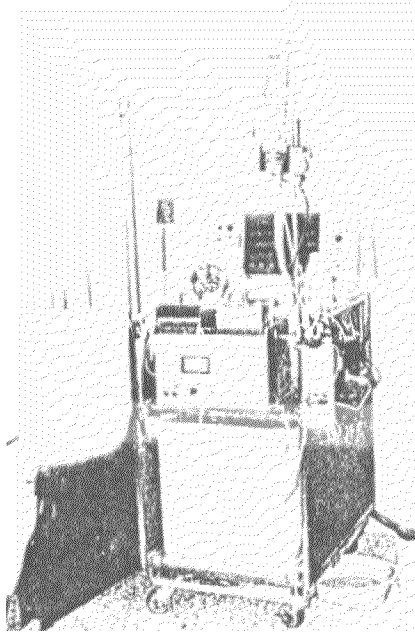


FIGURE 3.113. Portable respirator with wheel locks but no other provision for restraint

EQUIPMENT SEISMIC CATEGORY

- "D" support equipment

SEISMIC SPECIFICATION

- SDS-2

SEISMIC QUALIFICATION APPROACH

- Design team judgment.
 - Provide storage space when equipment is not in use
- Equivalent static coefficient analysis.
 - Of restraints when equipment is stored

REFERENCE FIGURES FOR INSTALLATION DETAILS

- 4.68, 4.69

RELATIVE DEGREE OF DAMAGE OF INADEQUATELY PROTECTED EQUIPMENT

- Minor to moderate

MOST LIKELY TYPE OR CONSEQUENCE OF DAMAGE FOR INADEQUATELY PROTECTED EQUIPMENT

- Toppling
- Collision when set in motion.
- Possibly inoperative.
- General cleanup required

Medical Systems

Sterile Infant Beds

Provision for anchoring portable infant beds (Figure 3.114) must be given both when the bed is in use and when it is stored.

EQUIPMENT SEISMIC CATEGORY

- "D" support equipment.

SEISMIC SPECIFICATION

- SDS-2

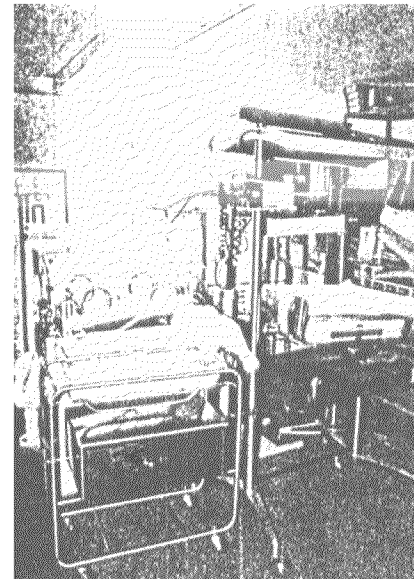


FIGURE 3.114. Stored infant beds without restraint provisions

SEISMIC QUALIFICATION APPROACH II

- Design team judgment.
- Equivalent static coefficient analysis.
 - For anchorage mechanism.

REFERENCE FIGURE FOR INSTALLATION DETAILS

- 4.69

RELATIVE DEGREE OF DAMAGE OF INADEQUATELY PROTECTED EQUIPMENT

- Minor.

MOST LIKELY TYPE OF CONSEQUENCE OF DAMAGE FOR INADEQUATELY PROTECTED EQUIPMENT

- Topped bed
- Possible infant injury
- Runaway beds.
- Possible collision with other equipment.
- General cleanup required

Medical Systems

Storage, Ad Hoc

Unattended storage of miscellaneous equipment (Figure 3.115) must be restrained to prevent monstrous cleanup problems

EQUIPMENT SEISMIC CATEGORY

- "E;" miscellaneous equipment.

SEISMIC SPECIFICATION

- SDS-2

SEISMIC QUALIFICATION APPROACH II

- Design team judgment.

REFERENCE FIGURES FOR INSTALLATION DETAILS

- 4.53, 4.54, 4.55, 4.56, 4.60, 4.61, 4.62, 4.63, 4.68, 4.69, 4.73, 4.76, 4.102, 4.103, 4.104.

RELATIVE DEGREE OF DAMAGE OF INADEQUATELY PROTECTED EQUIPMENT

- Minor.

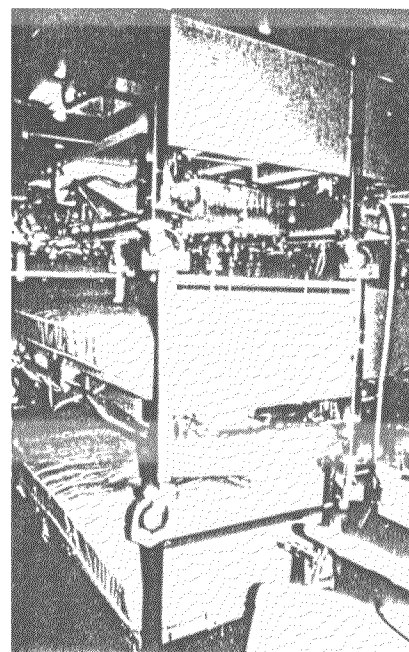


FIGURE 3.115. Ad hoc storage of unrestrained patient beds.

MOST LIKELY TYPE OR CONSEQUENCE OF DAMAGE FOR INADEQUATELY PROTECTED EQUIPMENT

- Topped stored items.
- General cleanup required.

REFERENCE FIGURE FOR EXAMPLE OF DAMAGED EQUIPMENT

- 3.198.

Medical Systems

Storage, General Shelves

Storage shelves should always be anchored and should always be equipped with shelf restrainers (Figure 3.116).

EQUIPMENT SEISMIC CATEGORY

- "C" support equipment.

SEISMIC SPECIFICATION

- SDS-2.