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MAINTENANCE STRATEGIES

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EC.02.04.01 EP 2



The hospital maintains either a written inventory of all medical equipment or a written inventory of selected equipment categorized by physical risk associated with use (including all life-support equipment) and equipment incident history.

The hospital evaluates new types of equipment before initial use to determine whether they should be included in the inventory.

(See also EC.02.04.03, EPs 1 and 3)


MAINTAINING MEDICAL EQUIPMENT

- ▶ Inventory is populated based on one of two strategies:
 - ❑ All equipment inclusion
 - ❑ Physical risk based process
 - For example, evaluating:
 - Function
 - Risk Levels
 - Maintenance Requirement
 - Utilize resources, i.e. the FDA MAUDE report
- ▶ All life support equipment is included
- ▶ All new types of equipment evaluated for inclusion

JOINT COMMISSION MEDICAL EQUIPMENT

- ▶ Medical equipment includes equipment used in
 - Life support, such as
 - anesthesia machines
 - ventilators
 - defibrillators
 - heart-lung machines
 - ▶ Monitoring, such as
 - Bedside monitors
 - Telemetry monitors


JOINT COMMISSION MEDICAL EQUIPMENT

- 
- ▶ Treatment, such as
 - ❑ Electrosurgery
 - ❑ Lasers
 - ❑ Diathermy
 - ▶ Diagnostic, such as
 - ❑ Laboratory analyzers
 - ❑ Radiology equipment
 - ❑ Endoscopes
 - ▶ Patient support, such as
 - ❑ Patient beds
 - ❑ Specialty beds
 - ❑ Lifts

Taken from the *Environment of Care Handbook*

Chapter 5 (page 73) 3rd edition

EC.02.05.01 EP 2



The hospital maintains a written inventory of all operating components of utility systems or maintains a written inventory of selected operating components of utility systems based on risks for infection, occupant needs, and systems critical to patient care (including all life-support systems).

The hospital evaluates new types of utility components before initial use to determine whether they should be included in the inventory.

(See also EC.02.05.05, EPs 1, 3-5)

MAINTAINING UTILITIES EQUIPMENT

- ▶ Inventory is populated based on one of two strategies:
 - ❑ All equipment inclusion
 - ❑ Based on physical risks for
 - Infection
 - Occupant needs
 - Systems critical to patient care
- ▶ All life support equipment is included
- ▶ All new types of equipment is evaluated for inclusion

JOINT COMMISSION UTILITIES EQUIPMENT




Utility System as defined in the Accreditation Manuals Glossary and EC.02.05.03 include:

- ▶ Electrical distribution
- ▶ Emergency Power Supply System (EPSS)
- ▶ Vertical & Horizontal Transport
- ▶ Heating, Ventilation & Air Conditioning
- ▶ Plumbing
- ▶ Boiler and Steam
- ▶ Piped Gases
- ▶ Vacuum Systems
- ▶ Communication Systems & Data Exchange

JOINT COMMISSION UTILITIES EQUIPMENT

- ▶ Specific Utility Systems include
 - ❑ Features of Fire Safety (EC.02.03.01)
 - ❑ Alarm and Notification (LS.02.01.34)
 - ❑ Suppression Systems (LS.02.01.35)
 - ❑ Design criteria (EC.02.05.01)
 - ❑ Power Distribution System (EC.02.05.03)
 - ❑ Emergency Power Supply Systems (EC.02.05.07)
 - ❑ Medical Gases (EC.02.05.09)
- ▶ Specific populations of equipment
 - ❑ Life support systems (EC.02.05.05)
 - ❑ Infection Control utility systems (EC.02.05.05)

EC.02.04.01 EP 3




The hospital identifies the activities, in writing, for maintaining, inspecting, and testing for all medical equipment on the inventory.

(See also EC.02.04.03, EPs 2 and 3)

Note: Hospitals may use different strategies for different items as appropriate. For example, strategies such as predictive maintenance, reliability-centered maintenance, interval-based inspections, corrective maintenance, or metered maintenance may be selected to ensure reliable performance.

EC.02.05.01 EP 3



The hospital identifies, in writing, inspection and maintenance activities for all operating components of utility systems on the inventory.

(See also EC.02.05.05, EPs 3 - 5; EC.02.05.09, EP 1)

Note: Hospitals may use different approaches to maintenance. For example, activities such as predictive maintenance, reliability-centered maintenance, interval-based maintenance, corrective maintenance, or metered maintenance may be selected to ensure dependable performance.

MAINTAINING EQUIPMENT: STRATEGIES

- ▶ Written strategies identify the activities for
 - ❑ Maintaining
 - ❑ Inspection
 - ❑ Testing
- ▶ Strategies may include
 - ❑ Predictive maintenance
 - ❑ Reliability-centered maintenance
 - ❑ Interval based maintenance
 - ❑ Corrective maintenance
 - ❑ Metered maintenance
 - ❑ Other recognized strategy
 - Manufacture's recommendations

MAINTENANCE STRATEGIES

▶ Predictive Maintenance

- ❑ The scheduled activities designed to extend equipment reliability based on performing activities prior to equipment failure based on risk levels and organization experience

▶ Interval Based Maintenance

- ❑ The scheduled activities are based on a preset schedule that is established regardless of need
- ❑ Determine Interval Time:
 - Manufacturer's guidelines
 - Accepted industry practices
 - Regulatory code requirements
 - Organization's past experiences
- ❑ Most preventive maintenance software programs are "Interval-Based"

MAINTENANCE STRATEGIES

▶ Reliability-Centered Maintenance

- ❑ Based on historical analysis of the reliability of equipment
- ❑ Anticipated maintenance activities to extend the reliability based on intersecting historical failure

▶ Metered Maintenance

- ❑ Based on established amount of time the equipment has operated rather than a calendar schedule

MAINTENANCE STRATEGIES

▶ Corrective Maintenance

- ❑ Equipment is not serviced based on preventive models, but allowed to run until repairs are needed
- ❑ Also includes response to any corrective measures related to the physical environment

▶ Other, such as manufacturer's recommendations

- ❑ Always during warranty period
- ❑ Evaluate against other strategies

EC.02.04.01 EP 4

- ▶ The hospital identifies, in writing, frequencies for inspecting, testing, and maintaining medical equipment on the inventory based on criteria such as
 - ❑ manufacturer's recommendations
 - ❑ risk levels
 - ❑ current hospital experience

(See also EC.02.04.03, EPs 2 and 3)

EC.02.05.01 EP 4

- ▶ The hospital identifies, in writing, the intervals for inspecting, testing, and maintaining all operating components of the utility systems on the inventory, based on criteria such as
 - ❑ Manufacturer's recommendations
 - ❑ Risk levels
 - ❑ hospital experience

(See also EC.02.05.05, EPs 3-5)

MAINTENANCE FREQUENCIES

Manufacturer's Recommendations

- ❑ New equipment that has no operating history should follow manufacturer's recommendations until enough history and level of risk has been established
- ❑ Industry experience has established that often manufacturer's recommendations are based on worse-case situations and may exceed the normal operating condition level maintenance activity

MAINTENANCE FREQUENCIES

► Risk levels

- ❑ Evaluating the potential risk of equipment failure is a significant part of evaluating maintaining, inspecting and testing requirements
- ❑ Based on physical risks impact for
 - Infection
 - Occupant needs
 - Systems critical to patient care

MAINTENANCE FREQUENCIES

▶ Hospital experience

- ❑ Evaluating the benefits of maintaining, inspecting and testing activities based on history may contribute to increasing or extending those activity periods

EC.02.04.03 THE HOSPITAL INSPECTS, TESTS, AND MAINTAINS MEDICAL EQUIPMENT

EP 2. The hospital inspects, tests, and maintains all life support equipment. These activities are documented. (See also EC.02.04.01, EPs 3 and 4; PC.02.01.11, EP 2)

EP 3. The hospital inspects, tests, and maintains **non**-life support equipment identified on the medical equipment inventory. These activities are documented. (See also EC.02.04.01, EPs 2-4 and PC.02.01.11, EP 2)

EC.02.05.05: THE HOSPITAL INSPECTS, TESTS, AND MAINTAINS UTILITY SYSTEMS

EP 2. The hospital inspects, tests, and maintains the following: Life support utility system components on the inventory. These activities are documented. (See also EC.02.05.01, EPs 2-4)

EP 3. The hospital inspects, tests, and maintains **non**-life support equipment identified on the medical equipment inventory. These activities are documented. (See also EC.02.04.01, EPs 2-4 and PC.02.01.11, EP 2)

EP 4. The hospital inspects, tests, and maintains the following: Infection control utility system components on the inventory. These activities are documented. (See also EC.02.05.01, EPs 2-4)

SURVEY PROCESS

Document Review

- ❑ Evaluate the Management Plan
 - Determine the Maintenance Strategies applied to the inspection, testing and maintenance of the equipment
- ❑ Evaluate the work completion rates (% complete)
 - To compute the *percent complete* divide the number of devices completed by the number of scheduled work orders

Example:

795 devices completed out of 825 scheduled = 96.4%

$$795 \div 825 = 96.36$$

SURVEY PROCESS

Evaluate the program documentation

- ❑ Logs are completed and reflect both Life Support Systems, Infection Control equipment, and Non-life support equipment on the inventory
- ❑ Accuracy of Inventory
 - All Life Support equipment must be represented on the inventory
 - Preventive maintenance frequencies must be clearly defined in writing
- ❑ Confirm work done as per scheduled activities
 - Ensure appropriate work is scheduled based on maintenance strategies
 - Evaluate equipment failure and scheduled actions

SURVEY PROCESS: STAFF INTERVIEWS

Department Leader

- ❑ Establish how the inventory was created
- ❑ Establish the Maintenance Strategies used
- ❑ Evaluate the Monitoring processes
- ❑ Evaluate the effectiveness of the program

Equipment Maintainers

- ❑ Evaluate their understanding of the maintenance process/strategies
- ❑ Evaluate competencies based on repeat work orders
- ❑ Evaluate work scheduled against completed

SURVEY PROCESS: STAFF INTERVIEW

Users of the Equipment

- ❑ Evaluate equipment reliability
- ❑ Evaluate response time when equipment fails
 - Evaluate emergency response process
- ❑ Evaluate “Culture of Safety”
 - Appropriate training of staff related to equipment use
- ❑ Customer satisfaction with department

Contract Services

- ❑ Evaluate reliability of equipment serviced
- ❑ Evaluate integration of the process

SURVEY PROCESS

- ▶ Evaluate the effectiveness of the program to maintain the equipment
 - ❑ Repeat work orders
 - ❑ Equipment turn-around time
 - ❑ Completion rates
- ▶ Evaluate confidence of the users while using equipment

CMS CONDITIONS OF PARTICIPATION


▶ 42 CFR 482.41

- ❑ Hospital must maintain adequate facilities for its services

▶ 42 CFR 482.41(c)(2)

- ❑ Facilities, supplies and equipment must be maintained to ensure an acceptable level of safety and quality.
- ❑ The CMS *Interpretive Guideline* states “the hospital must monitor, test, calibrate and maintain equipment periodically in accordance with the ***manufacturer’s recommendation*** and Fed and State law.”

CMS RESPONSE



I am happy to inform you that the Joint Commission's approach of utilizing a preventive maintenance schedule has been approved. Thank you for your cooperation and collaboration.

CMS Deputy Director
July 26, 2010

S&C: 12-07-HOSPITAL

- ▶ Published 12/2011
- ▶ Allows non-life support to adjust maintenance frequencies
- ▶ Restricts non-life support from adjusting maintenance activities
- ▶ Restricts life support from frequencies and maintenance activity adjustments
- ▶ Restricts equipment maintenance methods

DISCUSSION WITH CMS

- ▶ The Joint Commission had an opportunity to discuss the S&C: 12-07 4/9/2012
- ▶ Restriction related to test equipment lifted
- ▶ Collaborative discussion with the conclusion research would be of benefit
- ▶ Research should be specific to reliability of the Joint Commission process in EC.02.05.01

DISCUSSION, CONTINUED



Research Issues:

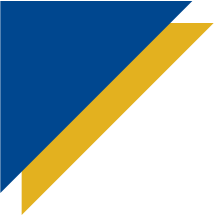
- ❑ How many organizations use the Joint Commission process?
 - What guidance is used to modify frequency and maintenance activities?
- ❑ Have there been any adverse outcomes based on solely on this process
 - If so, what?
- ❑ Self diagnostic equipment:
 - How many devices with this feature?

SURVEY MONKEY

- ▶ ASHE is hosting for Facilities:
 - ASHE.ORG
 - Select Facility Equipment Survey

- ▶ Clinical Engineering is hosted by AAMI at:
 - <https://www.surveymonkey.com/s/JCQuestionnaire>





QUESTIONS?

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