




2012

MAINTENANCE STRATEGIES

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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)

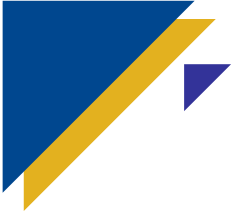
EC.02.05.01 EP 3



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

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- ▶ 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

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- ▶ 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

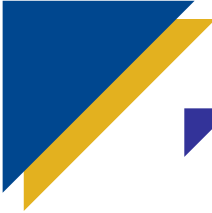
MAINTENANCE STRATEGIES



▶ 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.02.05.01 EP 4

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- ▶ 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.02.05.05: 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



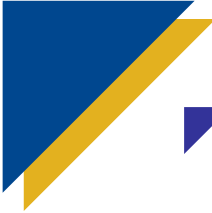
Users of the Equipment

- 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

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- ▶ 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.”

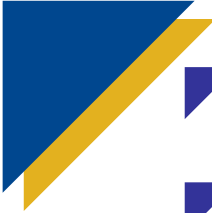
CMS RESPONSE



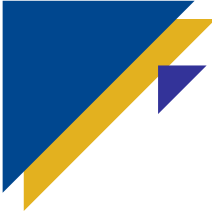
I am happy to inform you that the Joint Commission's approach of utilizing a preventive maintenance schedule has been approved. Thank you for your cooperation and collaboration.

CMS Deputy Director
July 26, 2010

S&C: 12-07-HOSPITAL

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- ▶ 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

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- ▶ 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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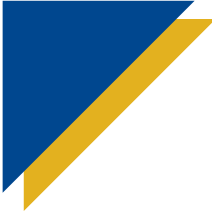
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