

# **U.S. Department of Energy Orders Self-Study Program**

**DOE O 430.1B**

**REAL PROPERTY ASSET MANAGEMENT**



**NATIONAL NUCLEAR SECURITY ADMINISTRATION  
SERVICE CENTER**

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**DOE O 430.1B  
REAL PROPERTY ASSET MANAGEMENT  
FAMILIAR LEVEL**

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**OBJECTIVES**

Given the familiar level of this module and the resources, you will be able to perform the following:

1. State when a site is required to have and maintain a ten-year site plan (TYSP).  
What is needed when a TYSP is not required?
2. Discuss contractor requirements for real property asset planning.
3. Discuss the vehicles used to establish land-use planning and management.
4. Define the term “value engineering.”
5. Discuss how repair costs associated with real property asset deficiencies are estimated.
6. Define the term “long-term stewardship” (LTS).
7. Discuss the minimum contents of the TYSP.
8. Discuss the formula

$$AUI = \frac{\text{utilization justified assets}}{\text{current real property assets}}$$

9. Discuss the purpose of the asset condition index (ACI).
10. Discuss the contractor’s requirements for documentation related to real property asset management.
11. Discuss the requirements related to notification to Headquarters for all DOE real property disposals by sale or lease.

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12. Discuss the required components that must be included in a disposition plan for real property assets that are no longer required.
13. List the minimum requirements for a real property maintenance program.
14. Discuss the requirements related to site planning for real property assets.
15. Discuss the key activities involved in the real estate function.

**Note: If you think that you can complete the practice at the end of this level without working through the instructional material and/or examples, complete the practice now. The course manager will check your work. You will need to complete the practice at this level successfully before taking the criterion test.**

#### **RESOURCES**

DOE O 430.1B, Real Property Asset Management, 9/24/03.

DOE P 580.1, Management Policy for Planning, Programming, Budgeting, Operation, Maintenance and Disposal of Real Property, 5/20/02.

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## **INTRODUCTION**

This level of the module is divided into two sections. In the first section, we will discuss the objectives and requirements associated with the Order and the contractor requirements document. In the second section we will discuss facility asset management tools and institutional general plant projects. We have provided an example to help familiarize you with the material. The example will also help prepare you for the practice at the end of this module and for the criterion test. <http://www.directives.doe.gov/> or through the course manager. You may need to refer to these documents to complete the examples, practice, and criterion test.

## **SECTION 1, OBJECTIVES AND REQUIREMENTS**

### **OBJECTIVES**

The objective of DOE O 430.1B, Real Property Asset Management, is to establish a corporate, holistic, and performance-based approach to real property life-cycle asset management that links real property asset planning, programming, budgeting, and evaluation to program mission projections and performance outcomes. To accomplish the objective, this Order identifies requirements and establishes reporting mechanisms and responsibilities for real property asset management. This Order implements DOE P 580.1, Management Policy for Planning, Programming, Budgeting, Operation, Maintenance and Disposal of Real Property, dated 5/20/02.

The objective of DOE P 580.1, Management Policy for Planning, Programming, Budgeting, Operation, Maintenance and Disposal of Real Property is to establish DOE management policy for the planning, programming, budgeting, operation, maintenance and disposal of real property owned by the United States and under the custody and control of DOE. Additionally, DOE policy and management must support innovative and performance based facilities and infrastructure management practices.

## REQUIREMENTS

The management of real property assets must take a corporate, holistic, and performance-based approach to real property life-cycle asset management that links real property asset planning, programming, budgeting, and evaluation to program mission projections and performance outcomes. Acquisitions, sustainment, recapitalization, and disposal must be balanced to ensure real property assets are available, utilized, and in a suitable condition to accomplish DOE missions. The following paragraphs set the requirements for the major real property asset management functional components of planning, real estate, acquisition, maintenance and recapitalization, disposition and long-term stewardship (LTS), value engineering (VE), and performance goals and measures.

### **Planning**

Planning is the overarching function within real property asset management that integrates the other functions of acquisition, real property utilization, maintenance, recapitalization, disposition, and LTS into a coordinated effort to ensure that current and future mission needs are met. Planning is dependent on clear objectives, sound data, and effective communication.

For each non-closure site, results of real property asset site planning and performance must be documented in a ten-year site plan (TYSP) that is kept current and covers a 10-year planning horizon. For closure sites, disposition plans must be developed.

- The TYSP will be consistent with, and support development of, the integrated facilities and infrastructure (IFI) crosscut budget, identifying the resource requirements associated with TYSP implementation.
- The TYSP will be integral to, and support, the DOE planning, programming, budgeting, and evaluation system (PPBES).
- The TYSP will result in a consolidated and integrated plan replacing multiple reports. It will use the facilities information management system (FIMS), DOE's corporate real property asset database, for real property asset information.

The content of the TYSP must address how the site's real property assets will support the Department's strategic plan, the Secretary's 5-year planning guidance, and appropriate program guidance. It must be a comprehensive site-wide plan encompassing the needs of

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tenant activities. The format of the TYSP should be consistent within a program in accordance with program direction and guidance. Sections of the TYSP can be rearranged to meet the unique requirements of a site. As a minimum, TYSPs must address the following.

- The site's plan to meet program missions, budgets, planning estimates, and performance outcomes within the program's budgetary and out-year fiscal projections.
- An assessment of the current status of the site real property assets against delineated program missions, including discussions of condition assessments, maintenance and recapitalization plans, space utilization, real estate, excess facilities disposition, LTS, and unique site issues.
- The prioritized real property asset projects and activities required to meet program missions, budgets, and planning estimates. These include acquisition projects, elimination of excess property projects and activities, maintenance and recapitalization plans, disposition projects, and LTS requirements.
- The prior year plus ten additional fiscal years of activities, planned in accordance with Lead Program Secretarial Office (LPSO), Cognizant Secretarial Office (CSO), and Program Secretarial Office (PSO) annual program direction and guidance for mission projections and fiscal projections. It will be consistent with the Department's PPBES and the field budget call.
- A report on past performance and projected future outcomes, including the results from real property asset corporate and program performance measures. The report must compare the budget authority against the actual expenditures and the performance outcomes achieved at the site for the fiscal year that precedes the prior year.
- Space utilization activities and land-use that stabilize then reduce the costs by consolidating operations where practicable and eliminating excess facilities.

The TYSP must be submitted either concurrently with responses to the field budget call, or as directed by the LPSOs/CSOs/PSOs to be consistent with the PPBES cycle.

### **Real Estate**

The real estate function encompasses several key activities over the life cycle of real property assets. These activities involve acquisition by lease or purchase; planning and management, including taking inventory, making assignments, conducting utilization surveys, and tracking assets; screening for excess real property assets; and disposal of real property assets.

### **Acquisition**

Acquisition of real property assets through construction must be planned and accomplished to meet program mission projections. Acquisition planning should include life-cycle cost considerations.

Acquisition of real property assets up to \$5 million will be accomplished as general plant projects (GPPs). GPPs are miscellaneous minor new construction projects of a general nature, the total estimated costs of which may not exceed the Congressionally established limit of \$5 million. GPPs are necessary to adapt facilities to new or improved production techniques; to effect economies of operation; and to reduce or eliminate health, fire, and safety problems. These projects provide for design and/or construction and additions and improvements to land, buildings, and utility systems, and they may include the construction of small new buildings, replacements or additions to roads, and general area improvements. Institutional general plant projects (IGPPs) are a class of GPPs that are of a general institutional nature whose benefit cannot be directly attributed to a specific or single program and are required for a general site-wide need. Further, IGPPs may be used at the discretion of the LPSOs/CSOs/PSOs.

### **Maintenance and Recapitalization**

Real property assets will be maintained in a manner that promotes operational safety, worker health, environmental protection and compliance, property preservation, and cost-effectiveness while meeting the program missions. This requires a balanced approach that not only sustains the assets but also provides for their recapitalization.

Sustainment consists of maintenance and repair activities necessary to keep the inventory of facilities in good working order. Sustainment includes regularly scheduled maintenance

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and anticipated major repairs or replacement of components that occur periodically over the expected service life of the facilities. Lack of sufficient levels of sustainment can result in a reduction in service life.

Facilities eventually wear out or become outdated and incapable of supporting mission needs. These facilities will be replaced, recapitalized, or disposed of if they exceed needs. Recapitalization extends the service life of facilities or restores lost service life and consists of alterations and betterments needed to keep existing facilities modern and relevant in an environment of changing standards and missions. Recapitalization investments do not sustain facilities and will, therefore, be complemented by an effective sustainment program to protect the facility.

Sustainment and recapitalization requirements must be developed in support of the Department's strategic plan, the Secretary's 5-year planning guidance, and appropriate program guidance.

### **Disposition and Long-Term Stewardship**

Planning for disposition must be initiated when real property assets are identified as no longer required for current or future programs. Disposition includes stabilizing, preparing for reuse, deactivating, decommissioning, decontaminating, dismantling, demolishing, and/or disposing of real property assets.

LTS includes the physical controls, institutions, information, and other mechanisms needed to ensure protection of people and the environment where DOE has completed, or plans to complete, disposition. Disposition and LTS requirements are directly influenced by decisions made during the acquisition, maintenance, and operation of the assets. Decisions made during the utilization of assets need to consider their disposition and LTS implications. A balance must be established between accomplishment of DOE missions and the disposition and LTS required to reduce risks to workers and the public and minimize real property asset life-cycle costs.

Disposition and LTS activities must be consistent with the guiding principles and core functions of the Department's integrated safety management and facility disposition policies.

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### **Value Engineering**

VE is an organized effort directed at analyzing the functions of systems, equipment, facilities, services, and supplies for the purpose of achieving the essential functions at the lowest life-cycle cost consistent with required performance, reliability, quality, maintainability, environmental protection, and safety.

### **Performance Goals and Measurements**

The DOE PPBES requires that performance measures be established that link performance of program goals and budgets to outputs and outcomes. All DOE elements must develop real property asset performance measures commensurate with their duties and responsibilities. The LPSO/CSO must establish annual performance targets for their real property assets and state their expected performance outputs and outcomes in their annual direction and guidance. Site-specific measures must be developed by each site/field manager to assess the level to which the LPSO/CSO-established outputs and outcomes have been attained. Corporate measures for real property asset management include the following.

#### *Asset Utilization Index (AUI)*

AUI is the Department's corporate measure of facilities and land holdings against requirements. The index reflects the outcome from real property acquisition and disposal policy, planning, and resource decisions. The index is the ratio of the area of operating facilities or land holdings justified through annual utilization surveys (numerator) to the area of all operational and excess facilities or land holdings without a funded disposition plan (denominator).

#### *Asset Condition Index (ACI)*

ACI is the Department's corporate measure of the condition of its facility assets. The ACI reflects the outcomes of real property maintenance and recapitalization policy, planning, and resource decisions. The index is one minus the facility condition index (FCI). FCI is the ratio of deferred maintenance to replacement plant value. The FCI is derived from data in the FIMS.

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AUI and ACI measure the net result of numerous real property management and disposal policy, planning, and resource decisions over time. PPBES requires accounting for execution of resource decisions made during planning, programming, and budgeting.

#### CONTRACTOR REQUIREMENTS DOCUMENT

The contractor requirements document (CRD) establishes the requirements for DOE contractors, including National Nuclear Security Administration contractors, whose contracts involve the acquisition, management, maintenance, disposition, or disposal of real property assets. Contractors are expected to meet these functional requirements through tailoring of their business processes and management practices, and use of standard industry practices.

#### **Planning**

Based on DOE-furnished program planning guidance, the contractor must assess the current real property assets against program mission projections, identify the specific real property asset projects and activities required to meet program mission projections, and propose a 10-year planning horizon through the development of a TYSP or a disposition plan for closure sites.

#### **Documentation**

The contractor must document its real property management activities, including the site's plan to meet program missions, budgets and planning estimates, and performance outcomes.

#### **Facilities Information Management System**

The contractor must maintain FIMS data and records, which are DOE's corporate real property inventory database for all lands, buildings, trailers, and other structures and facilities. FIMS data must be current and verified annually.

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### **Real Estate**

The contractor must submit all real estate actions to acquire, utilize, and dispose of real property assets to DOE for review and approval; maintain, in a complete and current condition, all real estate records identified by DOE; and have a land-use planning and management process approved by the site LPSO.

### **Maintenance**

The contractor must maintain real property assets in a manner that promotes operational safety, worker health, environmental compliance, property preservation and cost-effectiveness while meeting the program missions. This requires a balanced approach that not only sustains the assets, but also provides for their recapitalization and includes the following as a minimum.

- A maintenance management program that includes a condition assessment of the real property assets, a work control system, management of deferred maintenance, a method to prioritize, and systems to budget and track maintenance expenditures.
- Identification of 5-year maintenance and repair requirements (sustainment) and funding for deferred maintenance reduction.
- Identification of 5-year recapitalization requirements to replace or modernize existing facilities.
- Condition assessments must be performed on real property assets at least once within a five-year period, and may be required more frequently for mission-essential facilities and infrastructure. The condition assessment program shall utilize a tailored approach based on facility status, mission and importance and the magnitude of the hazards associated with facilities and infrastructure.
- Inspection methodology shall be consistent with industry practice, and shall include identification of safety and health hazards. Deferred maintenance estimates will be based on nationally recognized cost-estimating systems or the DOE Condition Assessment Information System (CAIS). The condition assessment program will support FIMS reporting requirements.

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### **Disposition and Long-Term Stewardship**

When DOE identifies that a program mission is no longer required, the contractor must initiate preparation of affected real property assets for disposition, including potential reuse for other missions. Disposition and LTS activities must be consistent with the guiding principles and core functions of the Department's integrated safety management and facility disposition policies.

### **Value Engineering**

The contractor must use VE techniques in a tailored manner to reduce DOE's real property asset ownership costs (e.g., acquisition, operations, maintenance, and disposal) while maintaining the necessary level of performance and safety. For real property asset acquisition, disposition, demolition, repair, and recapitalization projects where the total value for a single item of purchase or contract is expected to be greater than \$5 million, a VE assessment shall be performed. Real estate acquisitions are excluded from VE.

<b>Note: You do not have to do example 1 on the following page, but it is a good time to check your skill or knowledge of the information covered. You may do example 1 or go to section 2.</b>
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### **EXAMPLE 1 SELF-CHECK**

1. State in your words what the NNSA hopes to achieve by implementing DOE O 430.1B.

The objective of DOE O 430.1B, Real Property Asset Management, is to establish a corporate, holistic, and performance-based approach to real property life-cycle asset management that links real property asset planning, programming, budgeting, and evaluation to program mission projections and performance outcomes.

2. Define the term “betterments.”

Betterments are capitalized improvements to facilities that result in better quality work, increased capacity, and/or extended useful life as required to accommodate regulatory and other changes to requirements. Determining when and to what extent expenditure should be treated as betterment requires judgment. The proper basis for determining whether or not betterment is effected is when the effect of the replacement is related to each unit when a minor item is replaced in each of a number of similar units, rather than to the cumulative costs.

3. Define the term “alterations.”

Adjustments to interior arrangements or other physical characteristics of an existing facility so that it may be more effectively adapted to or used for its designated purpose. Alterations do not result in betterment to a facility.

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## **SECTION 2, FACILITY ASSET MANAGEMENT TOOLS AND INSTITUTIONAL GENERAL PLANT PROJECTS**

In this section we will discuss the facility asset management tools and institutional general plant projects.

### **FACILITY ASSET MANAGEMENT TOOLS**

The facility asset management tools are the facilities inventory system and the condition assessment system. The facilities inventory system is a computerized database of facility inventory information. The condition assessment system is a management strategy to understand the condition of the facility and how much it will cost to replace and repair facility systems and components. Each of these tools will be discussed briefly.

#### **Facilities Inventory System**

DOE has implemented FIMS as its corporate real property inventory database. FIMS must be maintained as the complete and official record of all owned and leased lands, buildings, trailers, and other structures and facilities.

New records and changes to the database will be reported as follows.

- Energy consumption information for buildings and trailers; deferred, required, and actual maintenance costs; last inspection date and deficiency system information for buildings, trailers, and structures; and financial adjustment information and annual rent payments for buildings, trailers, and structures must be reported on an annual basis.
- Land, transfer, withdrawals, improvements, and acquisition of leases, permits and licenses, and other actions are updated when the actions are reported and issued.
- Data closeout and financial reconciliation takes place from October 1st to October 31st of each year. Actions completed before October 1st are only permitted for entry.

The FIMS Advisory Committee (FAC) has been established to serve as a forum for discussing and evaluating suggestions regarding development, operation, or administration

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of FIMS. FAC reviews are provided to the facilities data development committee and FIMS technical monitor for discussion and adoption. FAC voluntary membership consists of Federal and site contractor representatives.

Real property data elements in the DOE integrated management navigation system, the condition assessment information system database, and the office of environmental management integrated planning and budgeting system database must be consistent with the corresponding FIMS real property data elements.

#### CONDITION ASSESSMENT SYSTEM

The condition assessment process supports the vital process of identifying facility conditions that are founded on recognized, fully defined, industry-based inspection and deficiency standards. An assessment program is an essential tool in determining realistic requirements needed to obtain budgetary funding. It provides a picture across a site that can be used along with mission and other prioritization criteria to direct limited resources to crucial areas. A condition assessment program is the basis for developing supportable asset management projects and funding requests.

Condition assessments must provide for the following:

- An inspection of all assets using applicable codes and accepted industry standards
- A tailored approach based on facility status, mission and importance and the magnitude of the hazards within the facility
- A valid estimate of deferred maintenance costs
- A 5-year maintenance plan based on projections of serviceability, economic life, the mission of facilities and projected funding for deferred maintenance reduction
- A process to identify safety and health hazards
- Information that is accurate and supportable for budget planning and justification
- A comparison of conditions and costs between sites and programs
- Cost estimates and funding priorities for GPP, IGPP, line item, and other site-funded maintenance projects

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The CAIS database is the estimating system that is used to estimate deficiency costs. The costs must include contractor overhead/burden. The database or cost-estimating system must accommodate site craft, engineering service contractor, or other data entry. Each must break out asset deferred maintenance cost by asset components or systems, calculate a facility condition index by system, and have the ability to separate rehabilitation and improvement costs from deficiency costs.

### INSTITUTIONAL GENERAL PLANT PROJECTS

IGPPs are miscellaneous minor (i.e., up to \$5 million) new construction and betterment projects of a general institutional nature benefiting multiple cost objectives and required for general-purpose site-wide needs.

IGPPs do not include projects whose benefit can be directly attributed to a specific or single program. Further, IGPPs may be used at the discretion of the LPSO, CSO, or PSO. The IGPPs result in a renewed and revitalized infrastructure with

- cost-beneficial impact on a site's operations;
- replacement or upgrade to a core utility, land, and facility that is no longer reliable;
- improved productivity or efficiency in a core utility, land, and facility; and
- world-class science and technology.

The following are examples of IGPPs:

- Multiprogrammatic/interdisciplinary scientific laboratory and office space
- Institutional training facility
- Site-wide maintenance facilities and utilities
- New roads
- Multiprogrammatic facilities required for quality of life improvements

The following criteria apply to IGPPs:

- IGPP requirements are identified in the TYSP and approved by the LPSO.
- IGPP resource requirements must be identified in the integrated facilities and infrastructure crosscut budget.

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- IGPPs are not intended for use in incremental segments to construct larger facilities, including, for example, segmentation of a parking lot or utility system from the main structure it is designed to support or segmenting a single facility into separate segments located within close proximity to each other. Each IGPP must provide a complete and usable facility to satisfy mission need at the site. As part of each IGPP, the DOE field/area office manager must personally certify that the project is not part of an incremental segment such that the total would exceed the current authorized ceiling of \$5 million. This certification must be provided to the Headquarters program office before the start of each project and made a part of each project file.

**Note: You do not have to do example 2 on the following page, but it is a good time to check your skill or knowledge of the information covered. You may do the example or go to the practice.**



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### **EXAMPLE 2 SELF-CHECK**

1. List two facility asset management tools.

Two facility asset management tools are the facility information management system and the condition assessment system.

2. State the purpose of the CAIS.

The CAIS database is used to estimate deficiency costs.

3. Discuss the purpose of the TYSP.

The TYSP is a planning document that identifies the site's annual and strategic program requirements and priorities, and links these to real property asset requirements.



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3. Differentiate between GPPS and IGPPS.
4. Differentiate between sustainment and recapitalization.
5. Discuss the expected results of a condition assessment.

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6. Discuss what is included in long-term stewardship.

7. Discuss the purpose of value engineering.

8. Discuss the purpose of the facility condition index.

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9. Provide three examples of an IGPP.

10. Discuss three contractor requirements related to real property asset planning.

**Note: The course manager will check your practice and verify your success at the familiar level. When you have successfully completed this practice, go to the general level.**

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**OBJECTIVES**

Given the familiar level of this module and a scenario, you will be able to do the following:

1. List the key elements you would look for in the contractor's action plan to correct the situation described in the scenario.
2. State which requirements, sections, or elements of DOE O 430.1B apply to the situation described in the scenario.

<b>Note: If you think that you can complete the practice at the end of this level without working through the instructional material and/or the example, complete the practice now. The course manager will check your work. You will need to complete the practice in this level successfully before taking the criterion test.</b>
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**RESOURCES**

DOE Orders Self-Study Program, DOE O 430.1B, familiar level, 12/1/04.  
DOE O 430.1B, Real Property Asset Management, 9/24/03.

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## **INTRODUCTION**

The familiar level of this module introduced DOE O 430.1B. Several responsibilities and requirements from the Order were discussed. In the general level of this module, students are presented with a scenario that depicts a work situation related to the Order. The example scenario includes a situation, the actions taken to remedy the situation, and the requirements related to the situation. Students will be asked to review the contractor's actions and decide if they are correct. Students will also be asked to decide if the correct requirements were cited in each situation. Please refer to the Order and the other resources, as necessary, to make your analysis and answer the questions. You are not required to complete the example. However, doing so will help prepare you for the criterion test.

**Note: You do not have to do the example on the following pages, but it is a good time to check your skill and knowledge of the information covered. You may do the example or go on to the practice.**

### **EXAMPLE**

In February 2001 the Inspector General (IG) conducted an audit of the Atlas project. A condensed version of the audit report is contained in the scenario. Please review the scenario and answer the following questions.

1. Are the investigator's analysis and corrective actions appropriate? Explain your answer.
2. Are the requirements cited complete and applicable to the scenario?

### **SCENARIO**

On July 22, 2002, a locomotive engine derailed while pushing an empty fuel cask car. The locomotive and the cask car remained upright, and there was no risk of rollover. The engineer shut down the locomotive engine and secured the area. There were no injuries or environmental releases as a result of this incident. However, the cask car could have been carrying radioactive nuclear fuel. In this case, the derailment could have had more serious consequences.

Investigators found a broken switch point. However, they concluded that the direct cause of the derailment was indeterminate because of a combination of conditions they discovered, including a possible misalignment of the switch point, worn train wheels, and a cracked switch-point protector. Investigators attributed the root cause of this event to a less than adequate railroad inspection program. They also determined that the overall age and condition of the site rail system was a contributing cause. The rail system is approximately 50 years old and continues to wear because a funding shortfall for rail system maintenance has existed for several years.

As a result of the investigation, rail inspectors checked all switch rail points using magnetic particle nondestructive evaluation. They declared 27 of 207 points as suspect and removed them from service. The following corrective actions will be implemented to prevent recurrence of this type of accident.

- Review the effectiveness of inspection programs for railcars and rail turnouts.

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- Evaluate the effectiveness of training for personnel who perform rail car inspections and rail turnout inspections.
- Evaluate departmental instructions or procedures for railcar inspections and for rail turn-out inspections.
- Evaluate the effectiveness of current rail lubrication preventive maintenance practices.
- Management will review the adequacy of current maintenance funding for the rail system.

Because the railroad tracks are an element of the site's infrastructure, a DOE Order 430.1 condition assessment survey should have been performed to identify the deteriorating condition of the railroad tracks. Furthermore, because this was a case of deteriorating infrastructure that could adversely impact ES&H, the funding shortfall or unfunded maintenance activity should have been identified as an emerging ES&H issue in the annual budget submittal.

One requirement was cited in this scenario.

Write your answers below and then compare your answers to the ones contained in the example self-check.

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**EXAMPLE SELF-CHECK**

1. Are the investigator's analysis and corrective actions appropriate? Explain your answer.

The analysis and corrective actions are appropriate. .

2. Are the requirements cited complete and applicable to the scenario?

The requirement is stated in DOE O 430.1B, section 4d. The requirement cited was applicable to the scenario. However one additional requirement should have been included. Condition assessments must be performed on all real property assets at least once during any 5-year period using inspection methods in accordance with industry standards as stated in DOE O 430.1B, section 4d(3), page 10.

## **PRACTICE**

This practice is required if your proficiency is to be verified at the general level. The practice will prepare you for the criterion test. You will need to refer to the Order to answer the questions in the practice correctly. The practice and criterion test will also challenge additional analytical skills that you have acquired in other formal and on-the-job training.

Please review the following scenario and answer the following questions.

1. Was the situation handled correctly? If not, what should have been done?
2. Was the list of requirements, sections, and elements complete and correct? If not, state the correct or omitted requirements.

## **SCENARIO**

On November 18, 2002, a security police officer (SPO) was attempting to operate a roll-up door in the straddle ramp area when the chain sprocket came loose from the door drum drive shaft and fell to the floor. The sprocket landed approximately one foot from the SPO. There were no injuries to personnel or adverse effects to the environment as a result of the event.

An investigation revealed the following conditions.

The direct cause of this event was determined to be a defective or failed part. The sprocket fell because the main shaft shifted in the assembly over time forcing the sprocket off the end of the shaft. Qualified maintenance personnel performed an inspection of all of these types of doors looking for abnormalities. The sprocket was correctly reinstalled on the door. This was accomplished by drilling indentations into the shaft for the set screws and installing the correct length key for the key way.

A contributing cause of this event was lack of procedure. The lack of preventive maintenance (PM) on this door precluded maintenance personnel from discovering the problem before the sprocket came off the shaft. At the time the door was installed there was no system in place to ensure the equipment was placed in the PM system.

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Another contributing cause of this event was determined to be personnel error. The affected individual continued to try and operate the door after it was determined to be malfunctioning. A lessons learned will be developed and published stressing the need to notify the appropriate authorities when equipment is malfunctioning or is nonresponsive and to not continue to try and operate equipment when it is malfunctioning or nonresponsive.

The root cause of this event was determined to be an inadequate or defective design. This determination was based on the as-found condition of the drive sprocket and the drive shaft. No corrective maintenance history was found on the door that would have changed the original design or installation. Therefore, it was determined that the lack of an adequate key in the key way and the shaft not having a machined surface for the set screws to be set against allowed the sprocket to work its way from the end of the shaft.

The investigation determined that DOE O 430.1B does not apply to this scenario as this was a maintenance issue.

Write your answer on the next page and then bring the completed practice to the course manager for review.

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Level: General  
Date: 12/1/04

**Note: The course manager will check your practice and verify your success at the general level. When you have successfully completed this practice, the course manager will give you the criterion test.**