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ABSTRACT

This learning module, which is part of a management and supervisor training program for managers and supervisors employed at the Department of Energy's Waste Isolation Division, is designed to prepare trainees to use plant and industry experience to improve plant safety and reliability. The following topics are covered in the module's individual sections: the Department of Energy's occurrence report processing system (procedures for sending and sharing the reports electronically); other sources of information on plant experience; other sources of information on industry experience; procedures for screening plant and industry experience; and techniques for using plant and industry experience (benefits of and procedures for using the case study method). Each section includes some or all of the following: enabling objectives, an exercise requiring trainees to evaluate a manager's effectiveness in a given scenario, and lists of good practices and practices to avoid. Concluding the module are a list of "smart moves," five-item reference list, practice test, and test answers. Four examples illustrating the use of the case study method are appended. (MN)

Waste Isolation Division (WID)
Management and Supervisor Training (MAST) Program

PLANT AND INDUSTRY EXPERIENCE

MAS-122

This module was prepared by:

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Manager, Human Resources Development and Total Quality Date

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Manager, Environment, Safety, and Health Date

TRAINEE INFORMATION

Trainee Name: _____

Trainee SS#: _____

Date Module Started: _____ _____

Last Possible Date For Completion of Module Examination: _____

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A. INTRODUCTION

Terminal Objective

Upon completion of this module, trainees will be able to use plant and industry experience to improve plant safety and reliability.

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the module examination.

If you learn from the mistake of another, you can avoid repeating the same mistake. The knowledge needed to avoid mistakes also results in improved performance. Mistake avoidance and improved performance are the two primary benefits of sharing operating experience information.

This module provides you with information on sources of shared experience information and techniques for using such information to improve the performance of your department or section.

Module Overview

- The Occurrence Report Processing System. How occurrence reports are networked among Department of Energy (DOE) sites. Types of information available on the network.
- Other Sources of Information on Plant Experience. How plant experience information is shared internally.
- Other Sources of Information on Industry Experience. Industry experience information comes from several sources.
- Screening Plant and Industry Experience. How to screen experience reports for relevance to your department/section.
- Using Plant and Industry Experience. Techniques for using shared experience information to avoid mistakes and improve performance.

B. THE OCCURRENCE REPORT PROCESSING SYSTEM

Enabling Objectives

Upon completion of this section, the trainee will be able to perform the following:

1. Identify how event reports are electronically sent to the DOE and shared with other DOE sites.

2. Given a scenario, evaluate the manager's understanding of the DOE's occurrence reporting network.

A primary source of plant and industry experience information is the Occurrence Reporting Processing System (ORPS). Events that happen at the WIPP are called plant experience. Events that happen at other nuclear sites are called industry experience.

Reports on events at the WIPP are originated on a local personal computer, then sent electronically to a mainframe computer in Idaho. Once the report is stored on the mainframe computer, it is available for use by the entire DOE community.

The network allows DOE sites to share operating experience information in a timely manner. Event reports required by the DOE include 24-hour reports, 10-day reports, 10-day updates, and final reports. These are all shared on the ORPS.

The DOE ORPS generates approximately 600 final event reports each month. Of these, the occurrence reporting coordinator in the Emergency Management Section selects applicable reports that may be of interest to the WID. Abbreviated summaries of these reports are sent to each WID department manager. If desired, the full report may be obtained from the occurrence reporting coordinator.

When an event occurs at the WIPP that may be reportable, the event is assessed using WP 12-918, "Reporting Occurrences in Accordance with DOE Order 5000.3A." If the event is deemed reportable, a written report is electronically transmitted to the DOE within 24 hours.

Events are investigated per WP 12-921, "Investigation of Events." After a final occurrence report has been approved by the DOE Program Manager, the report is distributed to WID department managers.

If an event is determined to be non-reportable, the event may still be investigated. Examples of non-reportable situations that require investigation include:

- unusual or abnormal facility safety conditions
- unusual, abnormal, or unexplained facility system performance
- events reportable to agencies other than the DOE

The final investigative report for such events includes lessons learned and can be used in the same manner as a final occurrence report.

The ORPS also provides a database of past event reports. This database can be used to access reports by category, site, or other selected parameters. The database is an excellent tool for obtaining information on safety practices and operating practices used at other sites.

CRITICAL INCIDENT
EFFECTIVE BEHAVIOR

Occurrence: Two employees suggested that bicycles and tricycles be used to supplement golf carts for personal transport at the WIPP. As part of evaluating the suggestion, the ORPS database was searched to find out how many accidents involving bikes had occurred at other sites. The search showed 139 accidents occurred over three years at other DOE facilities. Injuries had resulted from cyclists falling over or from clothing becoming entangled in the cycle sprocket.

Impact: The employee suggestion was not used. The risk was deemed unacceptable based on accident reports from other sites.

Lessons learned: The ORPS can provide important information on the effectiveness or ineffectiveness of safety practices at other DOE sites.

C. OTHER SOURCES OF INFORMATION ON PLANT EXPERIENCE

Enabling Objectives

Upon completion of this section, the trainee will be able to perform the following:

1. Identify sources of plant experience information.
2. Given a scenario, evaluate the manager's effectiveness concerning use of plant experience information.

There are many sources of plant experience information other than the ORPS; an event need not be reportable in order to provide lessons learned. Experience information is available from any of the following:

- human performance errors in your workplace
- Lessons Learned Bulletins
- Lessons Learned self-study modules
- self assessments
- audit reports
- injury reports

Consider the following scenarios, which could occur in any office area:

- The telephone rings 14 times without being answered.
- A coffee machine is left ON overnight, posing a potential fire hazard.
- A personal computer crashes. The work in progress has no backup. A 37-page draft report is lost.

Information on simple events such as these can be obtained from your employees or from the responsible supervisor.

Operations Self Assessment prepares and distributes Lessons Learned Bulletins. If an event is severe or has safety

consequences, a Lessons Learned Bulletin may be promptly distributed to associated personnel. Normally, bulletins are based on final occurrence reports. The report can be on a WIPP event or on something that happened elsewhere. Bulletins are distributed as required reading for Operations personnel and may be distributed to managers of other departments. Information from Lessons Learned Bulletins is included in training courses as appropriate. For further information on Lessons Learned Bulletins, contact Operations Self Assessment.

The Human Resources Development and Total Quality Section prepares Lessons Learned self-study modules for site-wide use. The lessons can be from a significant event that occurred at the WIPP or elsewhere. Each module details the event, the consequences or potential consequences, and how a recurrence can be prevented. Upon completion, knowledge is assessed via an open-book test. Lessons Learned training is open to all WID employees.

A good practice is to look over recent self-assessments for your department or section. Often a self-assessment will turn up events useful as plant information.

Sometimes an audit finding will provide lessons learned of use to other departments/sections. Audit reports resulting from external reviews can be obtained from the department manager or from Regulatory Assurance. In addition, the corrective action plans for each finding from an external review are available from Regulatory Assurance.

The Monthly Injury Report from Industrial Safety also provides plant information. An injury that happened somewhere else in the plant may provide lessons learned for your employees. The report includes a brief description of each incident that resulted in injury at the WIPP. Details for lessons learned can be obtained from the associated department or from Industrial Safety.

D. OTHER SOURCES OF INFORMATION ON INDUSTRY EXPERIENCE

Enabling Objectives

Upon completion of this section, the trainee will be able to perform the following:

1. Identify sources of industry experience information.
2. Given a scenario, evaluate the manager's effectiveness concerning industry experience information resources.

Industry experience information is available from any of the following sources:

- people who have responsibilities similar to yours at other DOE sites
- DOE summaries, bulletins, and notices
- Nuclear Regulatory Commission Bulletins and Information Notices
- Mine Safety and Health Administration "Fatalgrams"
- Manufacturers of equipment used at the WIPP
- News clippings
- Trade press articles

It is a good practice to network with people who have responsibilities similar to yours at other DOE sites. Making professional contacts is a good way to find out about audits at other sites. Audit reports provide useful experience information.

Reports from other DOE sites also provide good industry experience information. If you learn of an event at another site that could provide lessons learned for your work area, call the appropriate manager or supervisor at the other site. Ask for enough details to use the lessons learned in your department/section.

Industry operating experience information also includes the following DOE publications, which are distributed to each

department manager by the occurrence reporting coordinator:

- Operating Experience Weekly Summary from the DOE Office of Nuclear Safety
- Safety Notice from the DOE Office of Nuclear Safety
- Environment, Safety & Health Bulletin and Environment, Safety & Health Safety Note from the DOE Assistant Secretary for Environment, Safety & Health

Regulatory Assurance distributes Nuclear Regulatory Commission Bulletins and Information Notices. Each bulletin or notice is sent to the appropriate WID department or section. The WIPP is not subject to Nuclear Regulatory Commission regulations. However, these notices provide operating experience information from the commercial nuclear industry that may apply to the WIPP.

Industrial Safety distributes "Fatalgrams" issued by the U.S. Mine Safety and Health Administration. These are sent to department managers.

Manufacturers of equipment used at the WIPP may also send operating experience information. This type of information is received by the Engineering Department and dispositioned by a cognizant engineer.

External and Governmental Affairs reviews and files clippings from 12 newspapers that circulate in New Mexico. Included are stories on the nuclear industry and other DOE sites, some of which could be used as industry experience information. Past clippings can be accessed by subject.

Industry experience is also covered by the trade press. Major events are routinely reported in Nuclear News and other industry trade journals. The WIPP Technical Library subscribes to more than 90 journals and newsletters on subjects such as nuclear energy, environmental management, government contracts, hazardous materials, hazardous materials transportation, engineering, mining, and computers.

CRITICAL INCIDENTS
EFFECTIVE BEHAVIOR

Occurrence: A Nuclear Regulatory Commission information notice distributed by WID Regulatory Assurance described fractures found in certain makes of electrical contactors. An inspection by Engineering located more than 50 of the contactors installed at the WIPP. A work request was subsequently submitted to replace the contactors with another make.

Impact: Potential failures in these heating units were averted by taking action on the information notice.

Lesson learned: Operating experience at commercial nuclear power plants can be used to avoid potential events at the WIPP.

Occurrence: Another Nuclear Regulatory Commission information notice distributed at the WIPP described a mishap involving a Halon gas cylinder at a commercial nuclear power plant. Technicians were removing peripheral fittings as required by procedure in order to test the content of the 36-inch-long, 350-pound cylinder. A technician incorrectly removed a fitting that vented the valve on the cylinder, which was pressurized to approximately 350 pounds per square inch. The cylinder zipped about in an uncontrolled manner, knocking a one-foot hole through a six-inch cinder block wall. Two technicians were injured, one seriously.

Impact: The lessons learned from this event were selected for use in gas cylinder safety training at the WIPP.

Lesson learned: Events at dissimilar sites can provide lessons learned that apply to WIPP operations.

E. SCREENING PLANT AND INDUSTRY EXPERIENCE

Enabling Objectives

Upon completion of this section, the trainee will be able to perform the following:

1. Identify good practices for screening plant and industry experience.
2. Identify practices to avoid in screening plant and industry experience.
3. Given a scenario, evaluate the manager's effectiveness in screening plant and industry experience.

Operating experience from another department, section, or another site usually requires some interpretation to be of use. In screening industry operating experience, ask the following:

1. Consider the event description -- could it happen in your department or section? Could something similar happen in your department or section?

   For example, an event involving a reactor rod control system likely will not apply to the WIPP. The event may be of use in demonstrating the importance of procedural compliance or some other lesson with broad implications. The lessons learned, however, would be better illustrated with an event that could happen at the WIPP. An event dealing with area radiation monitors and procedural compliance would be more realistic because radiation monitors are used at the WIPP. The Appendix shows an example of an event from another site.

2. Are barriers or practices in place that would prevent a similar event from occurring at the WIPP?
3. If barriers were in place that should have prevented or reduced the significance of the event, why and how did those barriers break down?
4. If a similar event were to occur at the WIPP, are plans in place to mitigate the event?
5. Does the event emphasize the relevancy of policy or training content to job performance requirements or to problems likely

to be encountered on the job?

6. Will the event help you emphasize a training topic or a section goal?

Events at dissimilar sites can be useful if items such as the following are addressed:

- procedural error
- equipment failure
- attention to detail
- switch mis-positioning
- tagging error
- design shortcoming

Industry experience information is abundant. You can expect to screen out a majority of the available reports. Here's why: with a substantial effort, you can find some aspect of almost any experience report that could conceivably apply at the WIPP. In passing along all available reports, you would inundate your employees with information of marginal use. Conversely, if you screened out all events except those at DOE mines that handle TRU waste, your employees would be denied the benefit of learning from the mistakes of others who perform similar tasks. It is therefore important to exercise judgment in screening industry experience information.

There are several expedient ways to disseminate lessons learned from industry operating experience. A "Fatalgram" from the Mine Safety and Health Administration, for example, can work well when distributed as required reading. Each one includes a line drawing that graphically depicts the fatal accident. The drawing helps the reader visualize the tragedy.

Lessons Learned Bulletins based on final occurrence reports also can work well when distributed as required reading. The bulletins translate industry report recommendations into lessons learned that apply at the WIPP.

Good Screening Practices

- When scanning experience information reports or summaries, look for events that could happen in your section or department.

- Select an event that brings home a training topic.
- Use required reading for "Fatalgrams" and Lessons Learned Bulletins that are not selected for case studies.
- Edit investigation reports or ORPS reports

  Unedited reports contain extra information that slows comprehension by the reader. For use in required reading, consider preparing a separate document that describes the event, the causes, and the lessons learned.

Practices to Avoid

- Dismissing an otherwise useful event on the grounds that it happened at a dissimilar site
- Distributing too much information as required reading

F. USING PLANT AND INDUSTRY EXPERIENCE

Enabling Objectives

Upon completion of this section, the trainee will be able to perform the following:

1. Identify the benefits of using the case study method.
2. Identify good practices for presenting a case study.
3. Identify practices to avoid in presenting a case study.
4. Given a scenario, evaluate the manager's effectiveness in using the case study method.

There are many ways to learn from mistakes. The most difficult and costly way is to repeat the mistake. But even repeating the mistake does not guarantee that it will be avoided in the future.

Effectiveness is important in learning from mistakes. The following paragraphs give several methods of learning from mistakes, starting with the least effective and progressing to the most effective.

Just telling your employees to avoid mistakes is ineffective. How would you feel if your boss told you: "You made a mistake today. I told you yesterday not to make mistakes. Weren't you listening?"

An equally ineffective method is to ignore plant and industry experience. "It won't happen here" is a philosophy often repeated in history -- for ships that later sank, for military defenses that later crumbled, and for accidents that weren't supposed to happen.

Next is the impassioned warning. A manager or supervisor might advise employees in an attempt to avoid mistakes: "Look at this safety bulletin. Some guy didn't follow electrical safety rules and got killed. All of you need to follow rules. I don't want to see an incident like this around here. Ever." Is this message effective? Probably not.

Having your employees read about mistakes and solutions is somewhat effective. The problem is that you have no way of

knowing whether the employees learn the essentials that will enable them to avoid the same mistake. The message will have greatest impact on those who make the extra effort to read and understand. There are those who read the bulletin and don't fully understand the exact cause of the event, those who don't bother to read the bulletin at all, and those who tune out.

Required reading, which requires employees to initial that they have read and understand the document, is more effective. The document can be targeted to selected employees, if desired, or to all your employees. When issuing a document for required reading, it is important to set a time for completion. For additional details, see MAS-121, "Conduct of Operations." A fundamental shortcoming of reading about mistakes is that employees are not required to demonstrate an understanding of how to avoid the mistakes.

The Case Study Method

The most effective means of learning from mistakes is what is known as the case study. You assemble your employees, describe the event, then ask pertinent questions. Your employees originate answers.

One big difference between the case study method and other methods is that your employees are required to use analytical skills. You also can immediately see whether the implications of the problem are understood -- their answers demonstrate their understanding or lack thereof.

The commercial nuclear industry has proven that this method is an effective management tool in preventing undesirable events from occurring or recurring. The method is endorsed by the Institute of Nuclear Power Operations.

To date, the case study method has been typically employed in the nuclear industry by Operations managers. They use it to educate personnel on reportable events such as hazardous spills and contamination incidents. However, the method can be effectively employed by any manager or supervisor to address any undesirable event. This includes problems such as a failure to meet a customer deadline or a violation of a policy.

You, as a manager or supervisor, should determine whether a non-reportable, undesirable event should be presented as a case study. Weigh the time and cost of covering the incident against the potential benefit of the lessons learned on your employees' operations.

Basic steps of the case study method are as follows:

1. Gather information.

   If your source of information is an occurrence report, use the event description. If your case study is on a non-reportable event such as something that happened to one of your employees, make notes to use in describing the event. Address the following elements:

   -why the case study is important to the employee
   -what happened
   -where and when it happened

2. If necessary, determine:

   -root cause (the cause that if eliminated will prevent recurrence)
   -contributing causes
   -corrective actions
   -lessons learned

   If your case study is based on a WIPP final occurrence report, these items will be included in the report. If the occurrence report is of an industry event, determine the corrective actions and lessons learned that apply to your department/section. If the case study is on a non-reportable event, analyze the event for its causes, corrective actions, and lessons learned.

3. Assemble affected personnel.

   The case study can be presented at a toolbox meeting, a pre-job briefing, shift turnover, a staff meeting, or a safety meeting.

4. Describe the incident.

   Give a brief description lasting no longer than 5 or 10 minutes. Then shift from talking to asking.

5. Ask personnel to identify the impact of the event.

   For example, the potential impact of leaving a coffee maker ON after hours:

   a. Slight impact -- Security personnel will turn the coffee machine off while making rounds during the night.

   b. Greater impact -- the machine will short out and trip a circuit breaker.

c. Dangerous impact -- the machine will start a fire.

If no one correctly identifies the impact, provide hints. Encourage your employees to originate answers.

6. Ask personnel to identify root and contributing causes of the event.

Start by asking personnel to list probable causes. Then ask them to determine the cause that if eliminated would prevent recurrence.

7. Ask personnel to identify possible corrective actions.

Agree on a corrective action for each cause listed in the previous step. If the group is stumped, provide hints.

8. Ask personnel to identify the lessons learned for the event.

Again, the idea is to have your employees originate lessons learned on their own without being told. What can be done to prevent or mitigate such an event in your workplace?

The Appendix to this module contains case study information taken from several events. For each event, the incident is described and typical case study questions are listed.

If you need assistance in preparing your first case study, contact the Manager, Human Resources Development and Total Quality.

Corrective Actions

If in reviewing operating experience a weakness is identified in your area, corrective action should be developed by the manager. This might involve adding a step to a procedure, scheduling additional training, presenting a case study, or initiating a plant work request.

Good Practices for Using Case Studies

- Keep the description brief.
- When you're finished giving the description, stop telling and start asking.

  It is important that your employees use their own analytical skills to think through probable causes and lessons learned.

- Write down your own answers to the case study questions beforehand.

  If needed, you can refer to your notes during the discussion.

- If you need more information about an event to properly prepare a case study, call the cognizant manager for details.

- If the event occurred at another site, have your employees explain how a similar event could happen at the WIPP.

- If a weakness is identified at the WIPP, ensure that corrective action is taken.

Case Study Practices to Avoid

- Telling too much

  The idea is to describe the event, then lead your employees to logical conclusions by asking questions.

- Starting the case study without adequate preparation

  If you don't know the desired answers beforehand, the case study will be confusing instead of beneficial.

- Answering questions for your employees

- Combining more than one event into a study

  Addressing more than one event in a case study breeds confusion.

G. SMART MOVES--WHAT YOU CAN DO NOW

Here are some things you can do now to make your section/department more effective:

- If you haven't done so already, get to know people who have responsibilities similar to yours at other DOE sites (*page 8*).
- Screen industry experience reports for items of benefit to your employees (*page 11*).
- Use judgment in selecting experience reports for required reading (*pages 12 and 15*).
- Start using the case study method to present plant and industry experience (*page 15*).
- Use case studies to prevent recurrence of problems (*page 15*).
- Consider having your employees complete Lessons Learned self-study modules (*pages 6 and 7*).

H. MODULE REFERENCES

WP 12-918	"Reporting Occurrences in Accordance with DOE Order 5000.3A"
WP 12-921	"Investigation of Events"
WP 12-922	"Distribution of Occurrence Summary Reports"
	Case Studies: A Practical Method of Instruction, handout at the TAP Workshop '92, Phoenix
INPO 89-005	Guidelines for the Use of Operating Experience
INPO 88-015	Guideline for Incorporating Operating Experience into Training Programs

I. PRACTICE TEST

1. The ORPS allows DOE sites to share

   a. only final occurrence reports.

   b. only initial occurrence reports.

   c. event reports required by the DOE.

   d. audit reports.

   (B.1)

2. If an event is deemed reportable, a written report is electronically transmitted to the DOE

   a. within two hours.

   b. within 24 hours.

   c. before the 10th day.

   d. if requested by the DOE.

   (B.2)

3. After hearing about the loss of a lengthy document in a computer disk failure, a manager draws up lessons learned for a case study. Is this a good practice? Why?

   a. YES -- the case study document will be placed on the ORPS and shared with other DOE sites.

   b. YES -- an event need not be reportable in order to provide lessons learned.

   c. NO -- only reportable events should be used for case studies.

   d. NO -- only events that are formally investigated should be presented as case studies.

   (C.2)

4. A supervisor who is explaining the sources of operating information available from industry sources states, "The Nuclear Regulatory Commission sends bulletins and notices to the WIPP that sometimes provide helpful information." Is this an accurate statement? Why?

   a. YES -- the Nuclear Regulatory Commission works with the DOE to regulate the WIPP.

   b. YES -- operating experience information from the commercial nuclear industry may apply to the WIPP.

   c. NO -- the Nuclear Regulatory Commission only sends bulletins and notices to commercial nuclear sites.

   d. NO -- Nuclear Regulatory Commission bulletins and notices are of no help at the WIPP.

   (D.1)

5. A good way to find out about audit experiences at other sites is to

   a. research the ORPS database.

   b. check past issues of the Operating Experience Weekly Summary from the DOE Office of Nuclear Safety.

   c. network with people who have responsibilities similar to yours at other DOE sites.

   d. check with General Accounting.

   (D.3)

6. A manager photocopies an event report from the ORPS and distributes the copies to employees as immediate required reading. Is this a good practice? Why?

   a. YES -- event reports from other sites, as they come off the ORPS, work well when distributed as required reading.

   b. YES -- employees should be required to read the previous day's event reports from the ORPS before starting their work day.

   c. NO -- unedited event reports contain extraneous information that slows comprehension by the reader.

   d. NO -- event reports should not be distributed as required reading.

   (E.2)

7. An event summary from Hanford catches a section manager's attention because it deals with the failure of equipment similar to equipment used at the WIPP. The manager requests a copy of the full ORPS report so that a case study can be prepared. Is this a good practice? Why?

   a. YES -- events at dissimilar sites can be useful if equipment failure is addressed.

   b. YES -- the Hanford Site is similar to the WIPP.

   c. NO -- the event report, once obtained from the ORPS, should be distributed as is to employees.

   d. NO -- this is not a useful topic for a case study.

   (E.1)

8. Which of the following is the best way to present a case study?

   a. describe a reportable event to your employees so that they can draw their own conclusions.

   b. write up the lessons learned from an event of your choosing and read the lessons learned to your employees.

   c. assemble your employees, describe the event, then ask pertinent questions.

   (F.2)

9. Effectiveness is important in learning from mistakes. Having your employees read about mistakes and solutions is

   a. ineffective.

   b. as effective as presenting a case study.

   c. somewhat effective.

   d. not as effective as telling your employees to avoid mistakes.

   (F.4)

10. A non-reportable event should be presented as a case study if

   a. there are no suitable reportable events available at the time of the meeting.

   b. the event is too complicated to be written up for distribution to your employees as required reading.

   c. the potential benefit of the lessons learned outweighs the time and cost of covering the incident.

   (F.4)

J. ANSWERS AND FEEDBACK FOR THE PRACTICE TEST

1. c. event reports required by the DOE.

2. b. within 24 hours.

3. b. YES -- an event need not be reportable in order to provide lessons learned

4. b. YES -- operating experience information from the commercial nuclear industry may apply to the WIPP

5. c. network with people who have responsibilities similar to yours at other DOE sites.

6. c. NO -- unedited event reports contain extraneous information that slows comprehension by the reader

7. a. YES -- events at dissimilar sites can be useful if equipment failure is addressed

8. c. assemble your employees, describe the event, then ask pertinent questions.

9. c. somewhat effective.

10. c. the potential benefit of the lessons learned outweighs the time and cost of covering the incident.

If you scored 80 percent or higher on the practice test, you are ready to take the module examination; please proceed to Human Resources Development and Total Quality.

If you scored less than 80 percent on the practice test, please re-read the module and take the practice test again. If you still have questions, contact the Team Leader, Professional Development or the Manager, Human Resources Development and Total Quality.

K. APPENDIX

EXAMPLES OF THE CASE STUDY METHOD

Note: The appendix is provided for information only; it is not used as a source of examination questions.

EVENT 1: CAM ALARM AT HANFORD

DESCRIPTION: An alpha continuous air monitor (CAM) alarmed at 5:30 a.m. in a laboratory at the Hanford Site. The building manager responded from home. Thinking that the alarm was a pressure differential alarm on a glovebox, the manager entered the lab unaccompanied by a radiation protection technologist. Because the CAM was mounted on the wall between a fume hood and a glovebox, the CAM was not visible from outside the lab. One had to enter the lab to identify which device was in alarm. When the manager determined that the CAM was in alarm, he reset the alarm, surveyed himself, and reported the alarm. Instead of resetting the CAM alarm, the manager should have left the area in accordance with the lab's radiation protection procedures.

CAUSES: The root cause was found to be personnel error; a violation of procedure. The proper response to the alarming CAM was to leave the area. A contributing cause was the lack of visibility of the CAM from outside the lab.

LESSONS: It is important to follow procedures when responding to facility alarms. Be alert for design features that are not in keeping with the DOE's goal of keeping radiation exposures as low as reasonably achievable. The CAM was located out of plain view; whoever responded to the alarm had to enter the monitored area to discern whether the CAM was in alarm. Under this scenario, the responder could be inadvertently exposed.

CORRECTIVE ACTIONS: The importance of following procedures when responding to facility alarms was discussed with all building managers. The CAM alarm was relocated so that it could be seen from outside the lab.

QUESTIONS

1. What potential danger was faced by the building manager in entering the lab while the CAM was in alarm?

2. What was the impact of this event?

3. What are the possible causes of this event?

4. What is the root cause? The contributing causes?

5. What practices are in place to prevent a similar event from occurring with a CAM at the WIPP?

6. What is the immediate individual response to a CAM alarm at the WIPP?

7. Are the CAM alarms at the WIPP in plain view?

8. Why is it important to follow procedure in responding to a CAM alarm?

EVENT 2: CLOSE CALL

DESCRIPTION: At the WIPP site, one of three identical domestic water pumps was locked out of service for repair. Of the remaining pumps, one was running and the other was stopped in standby. The technician who was to perform the repairs started work on the standby pump instead of the locked out pump, even though each pump bore a unique identification tag and the proper pump was specified in the work order. When he noticed that the service valves associated with the pump were not locked closed, the technician stopped work and notified his supervisor. The event was determined to be non-reportable.

QUESTIONS

1. What potential dangers were faced by the technician in starting work on the standby pump instead of the locked-out pump?

2. What are the sources of stored energy in this system?

3. What was the impact of this event?

4. What are the possible causes of this event?

5. How could this event have been avoided?

6. What is the root cause? What are the contributing causes?

7. How can similar events be prevented in the future?

8. What policies exist to prevent this type of event?

9. What are the lessons learned from this event?

EVENT 3: ANYBODY THERE?

DESCRIPTION: A DOE auditor calls your office. He lets the phone ring 10 times. No one answers. He calls the facility manager, who then attempts to call you. The phone rings 15 times with no answer. After you are paged, you return the auditor's call and go back to your office. When you signed out earlier, most personnel were present. There were plenty of people to answer phones. Now, the sign-out board is full. No one is in. You arrange for the clerk/receptionist, who is out on an errand, to return.

QUESTIONS

1. What was the impact of no one minding the phone?
2. What was the potential impact? What could have happened had the page been unsuccessful?
3. What are the possible causes of this event?
4. How could this event have been avoided?
5. What is the root cause? What are the contributing causes?
6. How can similar events be prevented in the future?
7. What policy exists to prevent this type of event?
8. What are the lessons learned from this event?

EVENT 4: PAPER SHREDDER

DESCRIPTION: An employee leaned over a paper shredder while disposing of some expired records. The shredder caught the employee's identification badge, sliced halfway through the badge, then jammed. At the same time, the badge's lanyard tugged the employee toward the shredder.

QUESTIONS

1. What was the impact?
2. What was the potential impact? What could have happened if the badge were pulled through the shredder? If the lanyard had caught in the shredder?
3. What are the possible causes of this event?

4. How could this event have been avoided?
5. What is the root cause? What are the contributing causes?
6. How can similar events be prevented in the future?
7. What policy exists to prevent this type of event?
8. What are the lessons learned from this event?