Module 3: Hazard Identification and Assessment

Hazard prevention and control is key to an effective safety and health program. Requirements for written safety and health policies, programs and plans were discussed in Module 1. However, these written documents cannot be prepared in a vacuum: They must address the specific hazards of the work performed by employees. A written plan that is out of sync with workplace hazards and does not relate to working conditions only serves to confuse employees, and sends a message that management is not fully vested in the safety program.

Exercise: In your groups, discuss methods for identifying workplace hazards. Prepare to discuss with the class.

Worksite Analysis of Workplace Hazards

A worksite safety analysis starts with a review of the work performed at the workplace. A new safety manager, officer, specialist or representative should learn as much as possible about the work performed and related hazards. This review should include:

- A review of workplace machinery. The safety officer should review operation of equipment, and observe employees while they are working. Employees generally appreciate the opportunity to "teach" the safety representative about the work that they do and can point out where hazards exist. The safety representative should also review operating manuals for the equipment to increase familiarity of operations, hazards, and controls.
- Review Safety Data Sheets (SDSs) for chemicals on the worksite chemical inventory. Workplace chemicals should be periodically reviewed to make sure that SDSs are available for all chemicals used at the worksite.
- Review previous or existing versions of written safety programs and any related analysis, such as confined space hazard analysis, lockout tagout, or personal protective equipment.
- Review of past incidents, including investigation reports, OSHA 300 logs, injury and illness data, and workers compensation claims to determine patterns of workplace incidents
- Review any existing exposure monitoring and industrial hygiene reports, including recommendations.
- Safety committee meeting minutes and employee hazard reports.
- Face to face discussions with employees, foremen, supervisors, and managers

Worksite analysis is an ongoing process. Work and workplaces evolve, so the safety representative must continue to review workplace hazards.

Checklists are a useful tool for conducting an initial safety evaluation. The Idaho OSHA consultation office lists several program specific checklists (https://oshcon.boisestate.edu/self-inspection-checklists/), including this one for the general work environment:

GENERAL WORK ENVIRONMENT

☐ Are all worksites clean, sanitary and orderly?

☐ Are work surfaces kept dry and appropriate means taken to assure the surfaces are slip-resistant?

☐ Are all spilled hazardous materials or liquids, including blood and other potentially infectious materials, cleaned up immediately and according to proper procedures?

☐ Is combustible scrap, debris and waste stored safely and removed from the worksite promptly?

☐ Is all regulated waste, as defined in the OSHA Bloodborne Pathogens standard (29 CFR

1910.1030), discarded according to Federal, state and local regulations?

☐ Are accumulations of combustible dust routinely removed from elevated surfaces including the overhead structure of buildings, etc.?

☐ Is combustible dust cleaned up with a vacuum system to prevent suspension of dust particles in the environment?

☐ Is metallic or conductive dust prevented from entering or accumulating on or around electrical enclosures or equipment?

☐ Are covered metal waste cans used for oily or paint-soaked waste?

☐ Are all oil and gas-fired devices equipped with flame failure controls to prevent flow of fuel if pilots or main burners are not working?

☐ Are paint spray booths, dip tanks, etc., cleaned regularly?

☐ Are the minimum number of toilets and washing facilities provided and maintained in a clean and sanitary fashion?

☐ Are all work areas adequately illuminated?

☐ Are pits and floor openings covered or otherwise guarded?

☐ Have all confined spaces been evaluated for compliance with 29 CFR 1910.146? (Permit-required Confined Spaces.)

Washington State Department of Labor & Industries
Division of Occupational Safety and Health

Workplace Hazard Categories and Examples

For use with Workplace Hazard Basics course

Caught in or between

- **Exposed parts** on machinery, equipment, or tools that can spin or rotate, cut, roll, press, or grip during operation, adjustment, or maintenance activities.
- **Materials that can engulf** someone like soil in excavations, silage in grain storage, or sludge.

Chemical or substance

- **Hazardous liquids, vapor, spray, dust, or gas** released into the air or on surfaces due to work activities, processes, or emergencies.
- **Biological substances** like blood, animal waste, and mold that can cause illness.
- **Low oxygen** areas or spaces caused by decay or fermentation; or by replacement gases like nitrogen.

Electrical

- **Exposed or damaged electrical system parts** such as plugs, receptacles, extension cords, and wires.
- **Energized overhead or buried power lines.**
- **Tools, machinery, or walking surfaces** that have become energized due to contact with energized power lines.

Falls

- **Working up high** from ladders, roofs, aerial lifts, cranes, etc.
- **Floor or roof holes, uneven surfaces,** and other defects on walkways or working surfaces.

Workplace Hazard Categories and Examples

Fire or explosion

- **Flammable liquids** used around ignition sources like electric heaters, welding sparks, and open flame.
- **Combustible organic or metal dust** accumulations in and around process equipment.

Hit by or against

- **Projectiles and flying particles.**
- **Machinery or equipment** that can suddenly start up or become energized during servicing or installation due to the possible release of stored energy (e.g., pneumatic, hydraulic, electrical, thermal, etc.).
- **Stacked or overhead** items or materials that can fall or tip over and strike someone.
- **Violent individuals** committing robbery or assault.
- **Traffic and other danger zones** where forklifts, excavators, loaders, tractors, trucks, and cars operate.

Hot surface/Environment

- **Hot surfaces** exposed on process equipment.
- **Working outdoors in hot weather.**
- **Hot indoor** environments like foundries or structural fires.
- **Steam.**

Noise

- **Loud noise** from machinery, compressed-air tools, or other sources.

Workplace Hazard Categories and Examples

Slip or Trip

- **Icy, wet, or oily** floors and outdoor pathways.
- **Debris, worn out carpeting, tools, or other items** on floors or pathways.
- **Uneven** walking surfaces.
- **Damaged stairs.**

Sprain/Strain

- **Awkward body positions** like squatting, kneeling, or reaching above shoulder level.
- **Gripping heavy objects** like cinder blocks or exerting high hand force while using tools like pruners.
- **Heavy, frequent, or awkward lifting.**
- **Vibration** when using hand tools like sanders, grinders, jackhammers, and chainsaws.
- **Repeated motions** related to production-line or keyboard work.

Other

- **Extreme cold** caused by weather, refrigerated storage rooms, liquid pressurized gases like nitrogen.
- **Radiation** from sources like x-ray equipment, microwave- or radio-frequency towers and equipment, welding arcs, and lasers.
- **Pressure extremes** present during diving, tunneling, or high elevation work.

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Safety Self Inspections

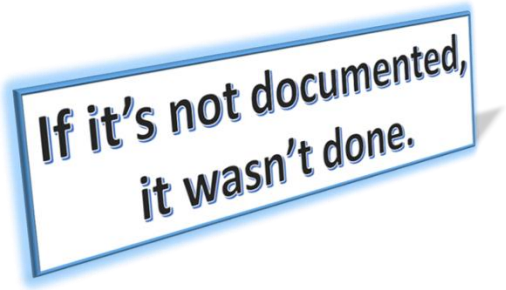
Hazards can creep into the workplace over time: Workstations and processes may change; tools, machinery, and walking working surfaces may deteriorate with use and age; material may accumulate or be stored incorrectly; or housekeeping and janitorial services may be insufficient. Subtle changes that occur slowly can be overlooked, or can become so familiar that they are just simply not seen.

OSHA standards address many specific inspection requirements. For example, forklifts must be inspected before use on each shift, and fire extinguishers must be inspected at least monthly.

General worksite inspections can identify hazards that might not otherwise be noticed. It is helpful to conduct inspections as a team of 3 or 4 people. Suggested team members include:

- Supervisor or manager of the work area
- Area safety committee representative
- Safety committee representative from another area
- Safety manager or safety specialist

Inspections should be documented for later discussion and follow up. A checklist can serve as documentation and provide focus for the inspection. There are many sample checklists available, but it may be beneficial for the inspection team to develop a safety inspection checklist that is specific to their workplace.



Photographs and video can be used as documentation, and can facilitate further review and communication about the hazard.

Some hazards identified during the inspection can be taken care of immediately. For example, water spilled on the floor can be cleaned up during the inspection to prevent someone from slipping in it. Other hazards may require further follow up. Regardless, there should be a mechanism to evaluate and document hazards identified during the safety self inspection. Safety committees should review the inspection report in order to evaluate the level of hazard and help identify appropriate controls once the inspection is complete.

Workplace Inspection Checklist

Inspected by: _____ Date:_____

Item	Condition	Follow-up needed?
Emergency & First Aid		
☐ Fire alarm stations clearly marked and readily accessible		
☐ Fire alarms free from visible damage		
☐ Lights above emergency exits have all bulbs lit		
☐ No obstructions in path to exits		
☐ "Crash bar" operates easily		
☐ Signs showing locations of fire extinguishers clearly visible		
☐ Fire extinguishers fully charged		
☐ Fire extinguishers have current inspection documented		
☐ Signs showing locations of first aid stations clearly visible		
☐ First aid kits readily accessible		
☐ First aid kit contents match inventory sheets		
☐ Signs showing locations of emergency eyewash stations clearly visible		
☐ Emergency eyewash stations fully accessible		
☐ Emergency eyewash stations check for operation		

Note: *This checklist does not address all possible workplace hazards. To learn how to identify hazards in your workplace, see* *http://www.lni.wa.gov/safety/GettingStarted/HazardsTasks/*

Employee Information Bookcase & Bulletin Board ☐ Sufficient copies of "Accident, Incident & Injury Report forms available ☐ APP, MSDS file & Safety Committee meeting minutes up to date ☐ Required L&I posters in separated location ☐ List of Safety Committee members current		
Walking, Working Surfaces ☐ Walkway markings through plant in good condition ☐ Walkways unobstructed; clear of equipment & materials ☐ Walkways clear on oil, grease, loose material and other slipping hazards ☐ Stair treads & handrails in good condition ☐ Walkway & stair illuminating light fixtures at proper levels ☐ Nothing stored underneath stairs		

Ladders ☐ Rungs & side rails securely fastened & free from visible damage ☐ Non-skid feet fully intact and swivel freely ☐ Ladders in use are used appropriately o No one standing on top rungs or platform o Tools/equipment not left on platform o Step ladders not used as straight ladders o People climbing ladders have "3 point contact"		

Machinery, equipment and power tools ☐ All guards in place and fully operational ☐ Safety placards in place and legible ☐ Lock-Out/Tag-Out kits in place and complete ☐ Wiring insulation intact – no cuts or breaks ☐ Operator's area free from debris and scrap		
Vehicles ☐ All lights, horns, signaling devices (including back-up alarms) fully functional. ☐ Seat belts show evidence of being in use during operation ☐ Fire extinguisher & first aid kit (on road vehicles) in place ☐ Tires in good condition; sufficient tread ☐ ROPS structure on forklifts checked for structural integrity ☐ Area where forklifts operate checked for damage that would indicate operator error		
Personal Protective Equipment ☐ All eye protection worn in plant marked as meeting ANSI Z-87 ☐ Eye protection has clear vision; no excessive scratches or pits on lenses ☐ All grinders have face shields available ☐ All workers in designated areas wear safety footwear ☐ Hearing protection worn while working with tools/machines listed in Hearing Conservation Plan		

Sanitation ☐ Bathrooms and employee break room are clean and free from litter ☐ All electrical outlets are GFCI protected ☐ Sufficient soap and paper towels are available ☐ Refrigerator has been cleaned out recently; no odor of spoiled food		

Hazardous Chemicals ☐ All solvents, cleaning supplies, lubricants, etc that have warning labels also have MSDS on file ☐ Ventilation fans tested for proper air movement in areas where solvents are used		
☐ List checked against previous two months to detect recurrent hazards/conditions		

Exercise: In your work groups, identify hazards in the following photos:	
	
	
	

Job Hazard Analysis (JHA)

A Job Hazard Analysis is a systematic method for reviewing work tasks to identify potential hazards and controls. OSHA Standards do not specifically require that employers conduct JHAs, however, JHAs are a methodology that could be used to meet hazard analysis requirements in OSHA standards.

Although the word "job" is used in the term "Job Hazard Analysis", a JHA focusses on tasks, not jobs. For example, a "Plumber" is a job title, and it would be impossible for a single JHA to address all the hazards that a plumber could face. A JHA is conducted for a task, for example, replacing a pipe or unplugging a drain, and it would require multiple JHAs to address all the hazards that a plumber might face. Therefore, it makes sense to start with the tasks that are performed frequently or have greater hazards.

To conduct a JHA, first break down the task by individual steps and list these out in the "Task or Step" column. For example, the first step on a task for "unplugging a drain" might be to evaluate the type of drain in a blocked sink by reaching into the sink and feeling what is there.

Each step identified will likely have one or more potential hazards. For example, when reaching into the blocked sink, the plumber could cut his/her hands on a sharp object or come into contact with biological or chemical contaminants in the water. Each potential hazard should be listed in the "Hazards" column associated with the task or step.

The last column is "Controls." One or more controls is identified for each potential hazard. For example, use of a probe or tool could be used in order to prevent the plumber from coming into contact with sharp objects. Gloves and safety glasses could protect against contaminant exposure to skin and eyes. The process would then be repeated for each step identified.

Task or Step	Hazards	Controls
1.	1.1 1.2 1.3	1.1.1 1.1.2 1.2.1 1.2.2
2.	2.1 2.2 2.3	
3.	3.1 3.2 3.3	
4.	4.1 4.2	

Job Hazard Analysis *example*

Grinding Iron Castings			
Task Description: Machinist reaches into metal box to the right of the machine, grasps a 15-pound casting and carries it to grinding wheel. Machinist grinds 20 to 30 castings per hour.			
Sequence of Basic Job Steps Break job into basic steps that tell what is done first.		**Potential Accidents/Hazards:** What accidents could occur to the person doing the step (I.e., struck by or against; caught in, fall, etc.).	**Recommended Job Procedures** What exactly should the person do or not do to avoid the accident.
1.	Reach into metal box to right of machine, grasp casting, and carry to wheel.	1.1. Struck by falling parts. Picking up casting, employee could drop it onto foot. The casting's weight and height could seriously injure the worker's foot or toes.	1.1.1 Remove castings from box and place them on a table next to the grinder. 1.1.2. Wear steel-toed shoes with arch protection. 1.1.3. Change to protective gloves that allow a better grip. 1.1.4. Use a device to pick up castings.
		1.2. Contact with sharp burrs and edges of castings can cause severe lacerations.	
		1.3. Strains to lower back from reaching, twisting, and lifting 15-pound castings from the floor.	

Exercise: In your groups, develop a job hazard analysis for:

- Making coffee
- Taking out the trash, *or*
- A work task at your worksite

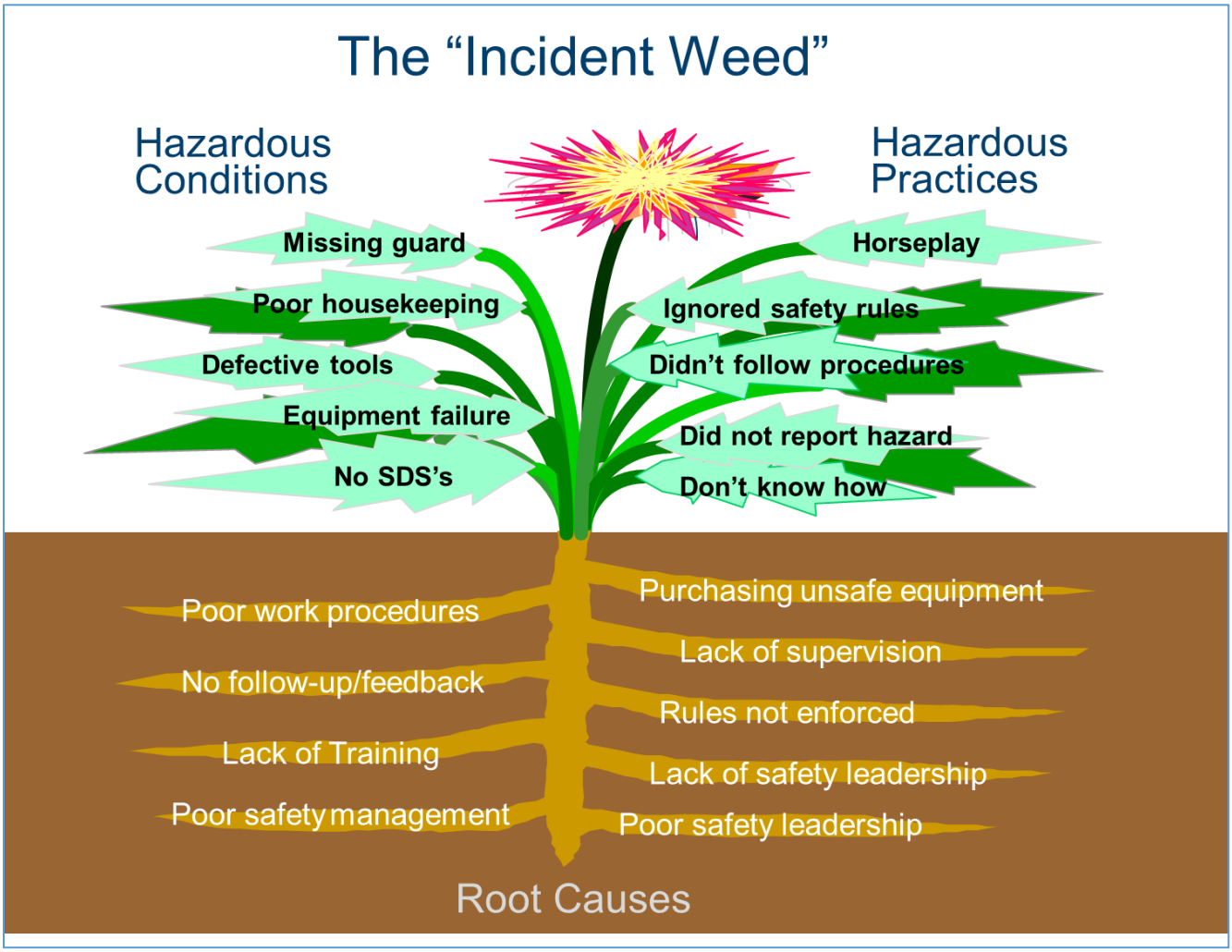
Job Task:		**Conducted by:**
		Date:
Task or Step	**Hazards**	**Controls**
1.		
2.		
3.		
4.		

5.		
6.		
7.		
8.		
9.		
10.		

Incident Investigation

An incident is an unplanned and unwanted event which disrupts the work process and results in, or has the potential to result in injury, harm, or damage to persons or property. Historically, this term has been defined as the word "accident." However, an "accident" is generally thought of as a random event that could not have been prevented. In fact, most harmful workplace incidents are entirely preventable.

Investigating a workplace incident, whether it resulted in an injury or not, provides the employer with an opportunity to identify and correct the contributing factors that lead up to the incident. Incident investigations that focus on identifying and correcting root causes rather than finding fault or blame demonstrate an employer's commitment to a safe and healthful workplace.



An incident is typically caused by multiple failures, rather than a single factor. Focusing on an immediate factor, such as failure to follow a safety rule to only operate a machine with a guard in place, may fail to identify the true causal factors, or root causes. In the example of the guard, it is possible that the employee did not install the guard because the guard was missing, or because it did not fit properly. Focusing in on just the immediate cause(s) is unlikely to prevent future incidents.

There are multiple methodologies for analyzing workplace incidents to determine root causes. A simple method is to "ask why five times." Then, once root causes are identified, they can be corrected to prevent future incidents.

The following example demonstrates the basic process of the "Ask Why Five Times" method of root cause analysis:

My car will not start. (the problem)

1) Why? - The battery is dead. (first why)
2) Why? - The alternator is not functioning. (second why)
3) Why? - The alternator belt has broken. (third why)
4) Why? - The alternator belt was well beyond its useful service life and has never been replaced. (fourth why)
5) Why? - ***I have not been maintaining my car according to the recommended service schedule.*** (fifth why and the root cause)

Exercise: In your groups, ask "why" five times to determine the root cause of the following near-miss incident (Note that this is not actually your workplace and you do not actually know the answers to all the "whys", so you will need to come up with plausible answers rather than actual answers):

A 50 lb carton fell off the top shelf of a 12' high rack and landed near a worker. Although this was a "near miss," it had potential to cause serious injury.

1. Why did the carton fall?

2. Why _____?

3. Why_____?

4. Why _____?

5. Why_____?

What are the root cause(s) that need to be addressed?

FactSheet OSHA EPA

The Importance of Root Cause Analysis During Incident Investigation

The Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) urge employers (owners and operators) to conduct a root cause analysis following an incident or near miss at a facility.[1] A root cause is a fundamental, underlying, system-related reason why an incident occurred that identifies one or more correctable system failures.[2] By conducting a root cause analysis and addressing root causes, an employer may be able to substantially or completely prevent the same or a similar incident from recurring.

OSHA Process Safety Management and EPA Risk Management Program Requirements

Employers covered by OSHA's Process Safety Management (PSM) standard are required to investigate incidents that resulted in, or could reasonably have resulted in, catastrophic releases of highly hazardous chemicals.[3] Similarly, owners or operators of facilities regulated under EPA's Risk Management Program (RMP) regulations must conduct incident investigations.[4]

During an incident investigation, an employer must determine which factors contributed to the incident, and both OSHA and the EPA encourage employers to go beyond the minimum investigation required and conduct a root cause analysis. A root cause analysis allows an employer to discover the *underlying* or *systemic*, rather than the *generalized* or *immediate*, causes of an incident. Correcting only an immediate cause may eliminate a symptom of a problem, but not the problem itself.

How to Conduct a Root Cause Analysis

A successful root cause analysis identifies all root causes—there are often more than one.

Consider the following example: A worker slips on a puddle of oil on the plant floor and falls. A traditional investigation may find the cause to be "oil spilled on the floor" with the remedy limited to cleaning up the spill and instructing the worker to be more careful.[5] A root cause analysis would reveal that the oil on the floor was merely a symptom of a more basic, or fundamental problem in the workplace.

An employer conducting a root cause analysis to determine whether there are systemic reasons for an incident should ask:

- Why was the oil on the floor in the first place?
- Were there changes in conditions, processes, or the environment?
- What is the source of the oil?
- What tasks were underway when the oil was spilled?
- Why did the oil remain on the floor?
- Why was it not cleaned up?
- How long had it been there?
- Was the spill reported?[6]

It is important to consider all possible "what," "why," and "how" questions to discover the root cause(s) of an incident.

In this case, a root cause analysis may have revealed that the root cause of the spill was a failure to have an effective mechanical integrity program—that includes inspection and repair—that would prevent or detect oil leaks. In contrast, an analysis that focused only on the immediate cause (failure to clean up the spill) would not have prevented future incidents because there was no system to prevent, identify, and correct leaks.

Properly framing and conducting a root cause investigation is important for a PSM or RMP-related incident. Take, for example, an incident involving an overfill and subsequent leak of hydrocarbons from a relief valve system that ignites and kills multiple workers. Prior to this fatal incident, there were multiple flammable releases from the relief valve system, but none ignited. The employer previously performed

incident investigations on the non-lethal incidents and determined that operator error was the cause of the overfills and subsequent leaks. However, a proper root cause investigation would have looked deeper into the incident, and determined that funding cuts—which resulted in a deficient mechanical integrity program and malfunctioning instrumentation—led to a dangerous situation that operators could not have prevented. Had these root causes been previously identified, the employer could have taken action to improve the mechanical integrity program and repair the instrumentation system, preventing the fatal incident.

Benefits of Root Cause Analysis for Employers

Conducting a thorough investigation that identifies root causes will help to prevent similar events from happening again. In this way, employers will reduce the risk of death and/or injury to workers or the community or environmental damage.

By using root cause analysis to prevent similar events, employers can avoid unnecessary costs resulting from business interruption, emergency response and clean-up, increased regulation, audits, inspections, and OSHA or EPA fines. Regulatory fines can become costly, but litigation costs can often substantially exceed OSHA and EPA fines. Employers may find that they are spending money to correct immediate causes of incidents that could have been prevented, or reduced in severity or frequency, by identifying and correcting the underlying system management failure.

Finally, when an employer focuses on prevention by using root cause analysis, public trust can be earned. Employers with an incident free record may be more likely to attract and retain high performing staff. A robust process safety program, which includes root cause analysis, can also result in more effective control of hazards, improved process reliability, increased revenues, decreased production costs, lower maintenance costs, and lower insurance premiums.

Root Cause Analysis Tools

Below is a list of tools that may be used by employers to conduct a root cause analysis. The tools are not meant to be used exclusively. Ideally, a combination of tools will be used.

- Brainstorming
- Checklists
- Logic/Event Trees
- Timelines
- Sequence Diagrams
- Causal Factor Determination

For simpler incidents, brainstorming and checklists may be sufficient to identify root causes. For more complicated incidents, logic/event trees should also be considered. Timelines, sequence diagrams, and causal factor identification are often used to support the logic/event tree tool.

Regardless of the combination of tools chosen, employers should use these tools to answer four important questions:

- **What** happened;
- **How** did it happen;
- **Why** it happened; and
- **What** needs to be corrected.

Interviews and review of documents, such as maintenance logs, can be used to help answer these questions. Involving employees in the root cause investigative process, and sharing the results of those investigations, will also go a long way toward preventing future similar incidents.

OSHA and EPA encourage employers to consult the resources below for more information about how to use these tools.

Resources

- *The Guidelines for Investigating Chemical Process Incidents*, Center for Chemical Process Safety, 2nd Edition, 2003.
- *DOE Guideline-Root Cause Analysis Guidance Document*, U.S. Department of Energy, Washington, DC, February 1992. http://energy.gov/sites/prod/files/2013/07/f2/nst1004.pdf
- *DOE Handbook-Accident and Operational Safety Analysis*, Volume I: Accident Analysis Techniques, July 2012, pp. 2-40–2-86. http://energy.gov/sites/prod/files/2013/09/f2/DOE-HDBK-1208-2012_VOL1_update_1.pdf

- *Quality Basics-Root Cause Analysis for Beginners*, James L. Rooney and Lee N. Vanden Heuvel, Quality Progress, July 2004, pp. 45–53. https://www.env.nm.gov/aqb/Proposed_Regs/Part_7_Excess_Emissions/NMED_Exhibit_18-Root_Cause_Analysis_for_Beginners.pdf
- *Incident [Accident] Investigations, A Guide for Employers, A Systems Approach to Help Prevent Injuries and Illnesses*, U.S. Department of Labor, Occupational Health and Safety Administration (OSHA), December 2015. www.osha.gov/dte/InclnvGuide4Empl_Dec2015.pdf
- OSHA's Incident Investigation Topics Page. www.osha.gov/dcsp/products/topics/incidentinvestigation
- OSHA's On-site Consultation Program offers free and confidential occupational safety and health services to small and medium-sized businesses in all states and several territories, with priority given to high-hazard worksites. On-site consultation services are separate from enforcement and do not result in penalties or citations. To locate the OSHA On-Site Consultation Program nearest you, call 1-800-321-6742 (OSHA) or visit www.osha.gov/dcsp/smallbusiness/index.html
- *The Business Case for Process Safety*, 2nd ed., Center for Chemical Process Safety, 2006. www.aiche.org/ccps/documents/business-case-process-safety. This resource describes how a strong PSM program has helped businesses succeed.
- *Mini Guide to Root Cause Analysis*, Geoff Vorley, Quality Management and Training Limited, Guilford, Surrey, UK, 2008. www.root-cause-analysis.co.uk/images/Green%20RCA%20mini%20guide%20v5%20small.pdf
- *Root Cause Analysis*, Washington State Department of Enterprise Services, Olympia, WA, 2016. www.des.wa.gov/services/Risk/AboutRM/enterpriseRiskManagement/Pages/rootCauseAnalysis.aspx. This resource describes additional root cause tools and training opportunities.
- *How to Conduct an Incident Investigation*, National Safety Council, 2014. http://www.nsc.org/JSEWorkplaceDocuments/How-To-Conduct-An-Incident-Investigation.pdf
- Accident Investigation Basics, Washington State Department of Labor & Industries, 2009. http://www.lni.wa.gov/safety/trainingprevention/online/courseinfo.asp?P_ID=145
- NFPA 921: *Guide for Fire and Explosion Investigations*. http://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards?mode=code&code=921

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[1] The statements in this document are intended as guidance only. This document does not substitute for EPA and OSHA statutes or regulations, nor is it a regulation itself. It cannot and does not impose legally binding requirements on the agencies, states, or the regulated community, and the measures it describes may not apply to a given situation based upon the specific circumstances involved. This guidance does not represent final agency action and may change in the future.

[2] *Guidelines for Investigating Chemical Process Incidents*, Center for Chemical Process Safety, 2nd ed., p. 179.

[3] 29 CFR 1910.119.

[4] 40 CFR 68.

[5] *Guidelines for Investigating Chemical Process Incidents*, Center for Chemical Process Safety, 2nd ed., p. 180.

[6] Id.

This is one in a series of informational fact sheets highlighting OSHA programs, policies, or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

U.S. Department of Labor

For assistance, contact us. We can help. It's confidential.

OSHA® Occupational Safety and Health Administration

www.osha.gov (800) 321-OSHA (6742)

DOC FS-3895 10/2016

Accident investigation form (example 1)

Use this form to help you investigate workplace accidents or incidents. Note: this form is for use within your company. It is not intended to replace DCBS Form 801: *Worker's and Employer's Report of Occupational Injury or Disease*.

Company: _____ Report no.: _____

Operation: _____ Investigator _____

Name of accident victim: _____ Victim's job title: _____

How long has accident victim been with this company? _____ How long on this job? _____

(Attach this information for each additional person injured.)

Witnesses:

Name: _____ Name: _____

Name: _____ Name: _____

Name: _____ Name: _____

When did the accident occur? Date: _____ Time: _____ Shift: _____

Where did the accident occur? Department: _____ Location: _____

What happened? (Describe sequence of events and extent of injury. Attach separate page if necessary.)

Has a similar accident ever occurred? ☐ Yes ☐ No If yes, when? _____

What caused the accident?

List all causes and contributing factors, which might include lack of supervision, inadequate training, poor equipment maintenance, and inadequate policy.

- _____
- _____
- _____
- _____
- _____

1

Accident investigation form (example 1)

List each corrective action to be taken. Who will do it and when will it be done?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Attach photographs, sketches of the scene, or other relevant information.

Prepared by: Title: Date:

<Source: http://osha.oregon.gov/Pages/topics/accident-investigation.aspx>

Analysis of injury and illness trends

The goal of incident investigation is to identify root causes of incidents in order to take appropriate corrective action and prevent a similar incident from occurring in the future. If the same or similar incident occurs a second time, this is an indication that the root cause(s) were not adequately controlled. If the same or similar incident happens so often that it becomes a trend, this would indicate that an employer would benefit from putting greater effort and resources into addressing the hazard that caused it.

Musculoskeletal injuries that result from poor ergonomics are costly and highly prevalent in the workforce, for example, and many employers have implemented programs to address ergonomic hazards despite the fact that OSHA does not mandate ergonomics programs through an specific rule.

Item	Definition	Comparing ... Yields this information
Nature of Injury/Illness	Identifies the injury/illness in terms of its principal physical characteristics	Nature of Injury/Illness with Part of Body Affected: Allows you to gauge the seriousness of the injuries/illnesses that have occurred and will frequently point to a need for greater use of personal protective equipment
Part of Body Affected	Identifies the part of the injured or ill person's body directly affected	
Sources of Injury/Illness	Identifies the object, substances, exposure or bodily motion that directly produced or inflicted the injury/illness	Accident Type and Source of Injury/Illness: Indicates how the employee came into contact with each injury/illness-producing object. Indicates the kinds of events that must be prevented and identifies the objects that need to be controlled.
Accident Type	Identifies the event which directly resulted in the injury/illness: □struck against □struck by □fall from elevation □falls on same level □caught in, under or between □rubbed or abraded □bodily reaction □overexertion □contact w/ electrical current □contact w/ temperature extremes □motor-vehicle	Nature and Source of Injury/Illness and Accident Type. Identifies the objects or substances that have injury/illness producing potentials; furnishes specific clues as to the particular kinds of PPE needed and in some instances, identifies specific materials that possibly should be eliminated from the operating process or for which safe handling procedures need to be developed.

Identify Hazards from Emergencies

Emergencies can happen at any time, disrupting anticipated business plans and processes. OSHA requires employers develop Emergency Action Plans (EAPs) to describe the actions that employees should take to ensure their safety in an emergency situation. A well developed and implemented plan will result in fewer employee injuries and less property damage, if, or when, an emergency occurs. If a response is chaotic, disorganized, or confused, this is typically the result of a plan that is poorly developed or not effectively implemented.

It is important to anticipate hazards, and plan for them, in developing an EAP.

A drill, or an actual emergency incident, is an opportunity to test the plan. A debriefing should be held after every drill or emergency incident in order to collect information on how the incident was handled and any new hazards that were identified. This should then be documented in an After Action Report (AAR) and included in a corrective action plan to address any new hazards identified.

Non-Routine Tasks

Injuries and illnesses often occur during non routine tasks. Hazards should be considered prior to undertaking any planned non routine work through the use of a Job Hazard Analyisis or other hazard identification tool.

Additional Resources:

Information on workzones and traffic hazards:

- https://www.workzonesafety.org/topics-of-interest/

Fall protection fact sheets:

- https://www.workzonesafety.org/training-resources/fall-prevention-fact-sheets/

OSHA Rules for Federal Agencies: Abatement of unsafe or unhealthful working conditions29 CFR 1960.30

- https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=11281

US Air Force Guidance to AFI 91-202, The US Air Force Mishap Prevention Program

- http://static.e-publishing.af.mil/production/1/af_se/publication/afi91-202/afi91-202.pdf