FPST 3013 – Safety Management

The Incident Investigation Process

Lecture 6

Investigative Techniques

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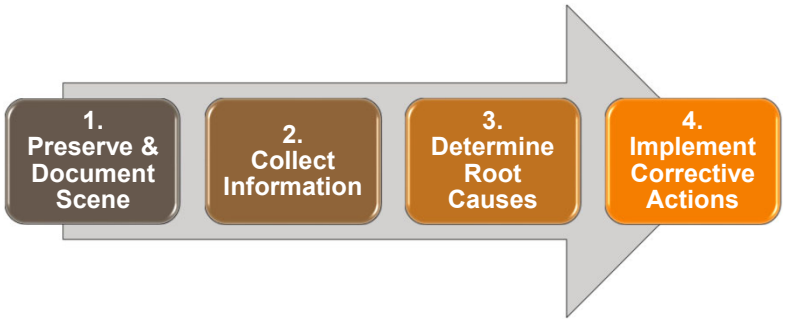

A systemic approach to prevent injuries and illnesses

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The Incident Investigation Process

Flow of Incident Investigation

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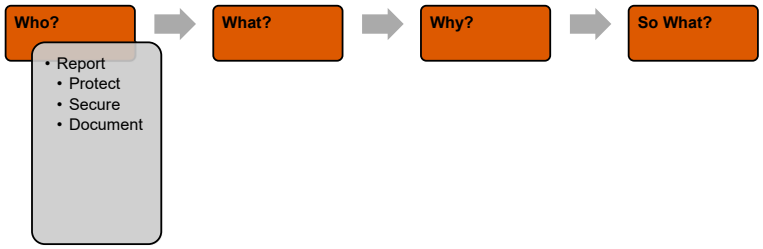
Flow of Incident Investigation



4

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The Incident Investigation Process – Who?

Initial Emergency Response Actions

Provide emergency medical care to the injured
- Rescue, first aid, first responder, local EMS etc.

Make initial notifications
- Family of injured
- Organization

5

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The Incident Investigation Process – Who?

Incident Reporting

Establish a process for employees to report incidents
- Notify supervisor
- Use forms/data systems

Ensure that employees do not feel intimidated to report an incident

Certain types of incidents may require AHJ notification
- OSHA – Fatality, Hospitalization, Amputation, loss of an eye
- Workers' Compensation (varies by location)

CAUTION

Beware of safety incentive programs that inhibit the reporting of incidents

OSHA prohibits this

6

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The Incident Investigation Process – Who?

Typical reasons for failing to report an incident
- Fear of punishment
- Concern about safety record, safety goals
  - Personal, work group, organization as a whole
- Concern about reputation
- Fear of medical treatment
- Desire to avoid work interruption
- Poor understanding of importance

Supervisors and Managers must set the tone that reporting incidents is important, must be done timely, and will not result in disciplinary action.
- Must establish a culture of learning and continuous improvement

7

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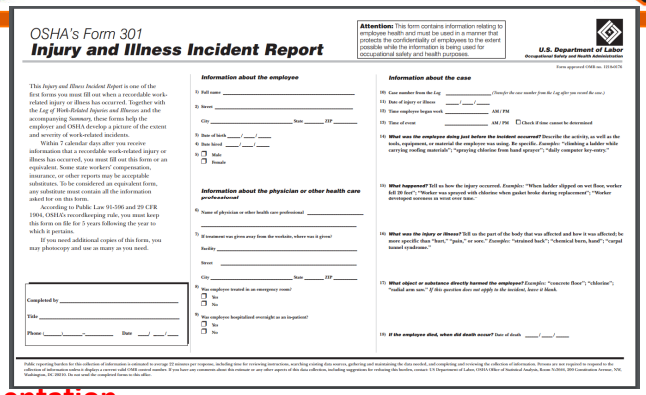

OSHA's Form 301

Injury and Illness Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Information about the employee

1) Full name

2) Street

City State ZIP

3) Date of birth

4) Date hired

5) Male / Female

Information about the physician or other health care professional

6) Name of physician or other health care professional

7) If treatment was given away from the worksite, where was it given?

Facility

Street

City State ZIP

8) Was employee treated in an emergency room? Yes / No

9) Was employee hospitalized overnight as an in-patient? Yes / No

Completed by

Title

Phone Date

Information about the case

10) Case number from the Log (*Transfer the case number from the Log after you record the case.*)

11) Date of injury or illness

12) Time employee began work AM / PM

13) Time of event AM / PM Check if time cannot be determined

14) **What was the employee doing just before the incident occurred?** Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. *Examples:* "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

15) **What happened?** Tell us how the injury occurred. *Examples:* "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) **What was the injury or illness?** Tell us the part of the body that was affected and how it was affected; be more specific than "burn," "pain," or sore." *Examples:* "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) **What object or substance directly harmed the employee?** *Examples:* "concrete floor"; "chlorine"; "radial arm saw." *If this question does not apply to the incident, leave it blank.*

18) **If the employee died, when did death occur?** Date of death

Public reporting burden for this collection of information is estimated to average 22 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about this estimate or any other aspects of this data collection, including suggestions for reducing this burden, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Documentation

8

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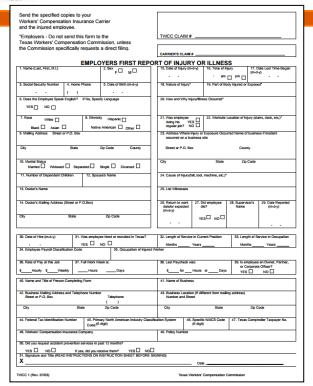
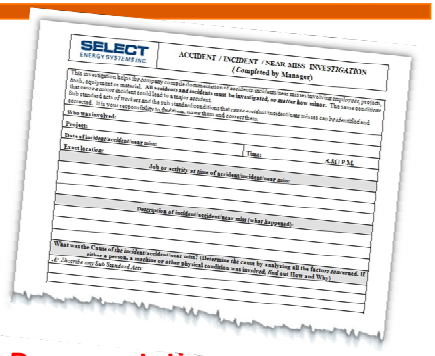


EMPLOYERS FIRST REPORT OF INJURY OR ILLNESS



SELECT ENERGY SYSTEMS INC.

ACCIDENT / INCIDENT / NEAR MISS INVESTIGATION (Completed by Manager)

Documentation

9

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The Incident Investigation Process – Who?

Establish a process to notify the organization when an incident occurs

Incident level	Initial Reporting Timeline
All Incidents	Report Immediately or as soon as awareness occurs
Minor Incident Near Miss	Notify immediate supervisor
Major	Notify Department Manager within 1 hour
Severe	Notify Senior Leadership within 1 hour
Catastrophic	Notify Crisis Management Team as soon as practical

Incident notification process should be part of overall Emergency Management Plan

10

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The Incident Investigation Process

Reporting and Notifications

- Incident Management Software Systems
  - ~ Real time reporting
  - ~ Smart phone/tablet enabled
  - ~ Built in workflows for notifications, due dates, etc.
  - ~ Trend tracking, KPIs, Dashboards, etc.

11

12

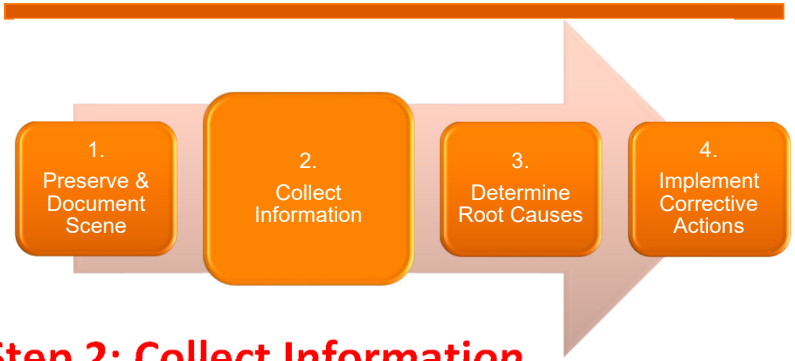
Preserve/Document Scene

1. Preserve & Document Scene

Begin the investigation **immediately** or as soon as possible to help ensure material evidence and memory are more reliable and stable because:

- **Material Evidence –** Such as tools and equipment can move or disappear from the scene
- **Memory –** As time passes, conversations with others and individual emotions distort witnesses' memories of what they actually saw and heard

13



Step 2: Collect Information

14

Collect Information

2. Collect Information

Once the scene is **preserved** and documented it is important to start digging for details and collecting information

Incident information is collected through **interviews, document reviews** and other means

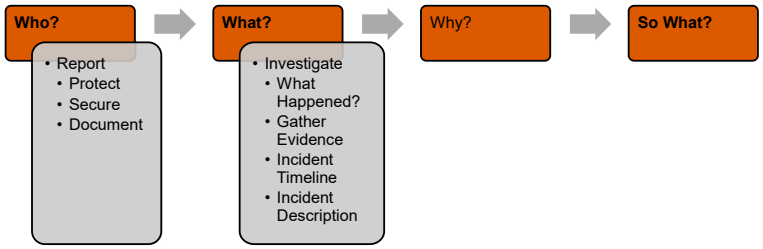
Interviewing doesn't stop at just asking questions, there are **"Why?"** and follow-up questions that need to asked

Information can be obtained from **people** and **documents/reports**

15

15

Flow of Incident Investigation



16

2. Collect Information

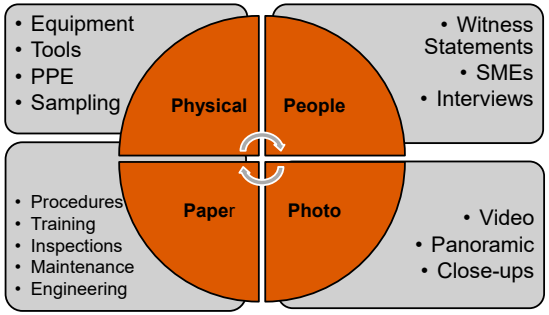
Information Sources

Interviews	Training records
Equipment manuals	Audit and follow-up reports
Industry guidance documents	Enforcement policies and records
Company policies and records	Previous corrective action recommendations
Maintenance schedules, records and logs	

17

17

Gather Evidence – The Four P's



18

Gather Evidence – the Four P's

- Hardware and solid material related to the incident
- Damaged equipment
- Non-destructive testing
- Material failure analysis
- Atmospheric/chemical sampling
- Guarding equipment
- Personal protective equipment

Physical

19

Gather Evidence – the Four P's

- Obtain witness statements as soon as possible
- People forget or change story over time
- Written statements if possible

- Who to interview
  - Injured workers
  - Eye-witnesses
  - Emergency responders
  - Operators/maintenance workers
  - Operational technical experts

People

20

Which Interview Technique is Best?

2. Collect Information

Watch two videos

- Bad Interview
- Good Interview

21

Interview Preparation

2. Collect Information

When is it best to interview?

- ASAP

Where should the interview be conducted?

- The incident scene, if possible, to help jog memory
- Otherwise a quiet place

When shouldn't interviews be conducted?

- Hospital
- When witness is too upset

22

Interview Tips

2. Collect Information

- Put the person at ease
- Build rapport
- Ask them to recount their version of the incident
- Ask open-ended questions
- Let the individual talk and allow the interviewee to complete their statements
- Repeat the facts & sequence of events back to the person
- Keep in mind the focus is determining root causes of the incident
- Take notes

23

Investigator Do's and Don'ts

2. Collect Information

✓Do explain who you are
✓Do be specific as to why you're there
✓Do be positive. Their knowledge is important
✓Do be diplomatic and understanding
✓Do be adaptable
✓Do express concern and desire to prevent similar incidents
✓Do ask their opinion
✓Do thank them for their cooperation

✕Don't argue
✕Don't ask "yes/no" questions
✕Don't be defensive
✕Don't suggest answers
✕Don't accuse
✕Don't rush
✕Don't interview in a crowd

24

Gather Evidence – the Four P's

Paper

- Policies and Procedures
- Training records of personnel involved
- Audit/Inspection Records
- Maintenance/PM records
- Equipment O&M Manuals
- Any prior incidents
- Engineering drawings
- HazOps, PHA, JHA's, Etc.

25

Gather Evidence – the Four P's

Photo

- Take "Big Picture" photos of the overall scene
- Take close-ups of damaged equipment
  - Include measurement devices to show perspective
- Include time/date stamp on all photos
- Keep a photo log to identify pictures and note their purpose.
- Take videos if appropriate

26

27

Write a coherent Incident Description

- Be objective
  - Tell what you have decided actually happened in detail. Don't assume or guess. Prove what you say.
  - State the facts of the incident
  - Do not assign blame
- Write in a style that everyone can follow
- Do not include individual names
  - Respect individual dignity
  - Use Job titles
- Do not include narrative that is irrelevant to the incident.

28

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Use a bullet list

- Item 1
- Item 2
- Item 3
- Item 4

29

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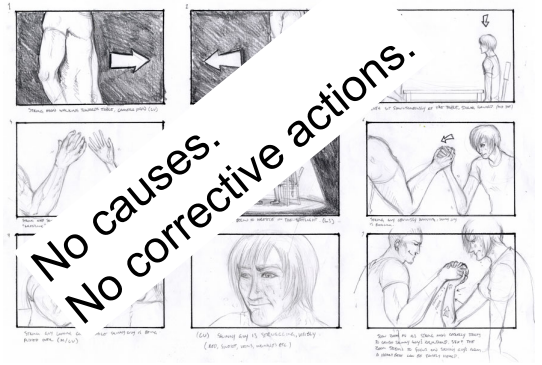
Sequence of events



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Incident Description Example

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Collaborative Ba

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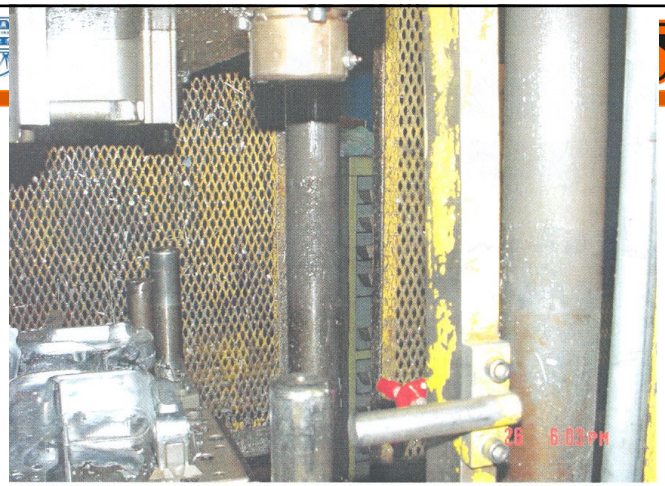


33

33

Incident Description

While employee was using trim press and caught his finger between the guide pin and bushing resulting in fingertip amputation.

34

Incident Description

Employee was trimming a part in a press. He had already trimmed hundreds of parts that day. He pulled back the pull bars with his wrists on the handles. When the press closed, the tip of his right index finger was caught between the guide pin and bushing resulting in an amputation to the tip of the finger.

35

It was a dark and stormy night, last night (1/25/19 11:45 pm) on graveyard shift. Bill went on his break in the breakroom. After he finished eating his dinner, he started to walk back to his work area. The hallway was very dark because a lightbulb had been burned out for months. He grabbed a ladder to change the bulb and then Rick ran into him with the forklift, knocking him off the ladder and breaking his arm. Mark, the foreman grabbed him up and took him to the hospital in his truck in the rain. They X-rayed him, found the arm to be broken, put him in a cast and gave him painkillers and sent him home for the night. He was cleared to come back to work tonight on light duty.

36

~~It was a dark and stormy night, last night~~ (1/25/19 11:45 pm) ~~on graveyard shift. Bill went on his break~~ in the breakroom. ~~After he finished eating his dinner,~~ he started to walk back to his work area. The hallway was very dark because a lightbulb had been burned out for months. He grabbed a ladder to change the bulb and then Rick ran into him with the forklift, knocking him off the ladder and breaking his arm. ~~Mark, the foreman grabbed him up and took him to the hospital in his truck in the rain. They X-rayed him, found the arm to be broken, put him in a cast and gave him painkillers and sent him home for the night. He was cleared to come back to work tonight on light duty.~~

37

On January 25, 2019 at 11:45 pm, employee (A) was standing on a ladder to change a lightbulb in the south hallway of Warehouse B. The hallway was dark due to light being burned out for 2 months.

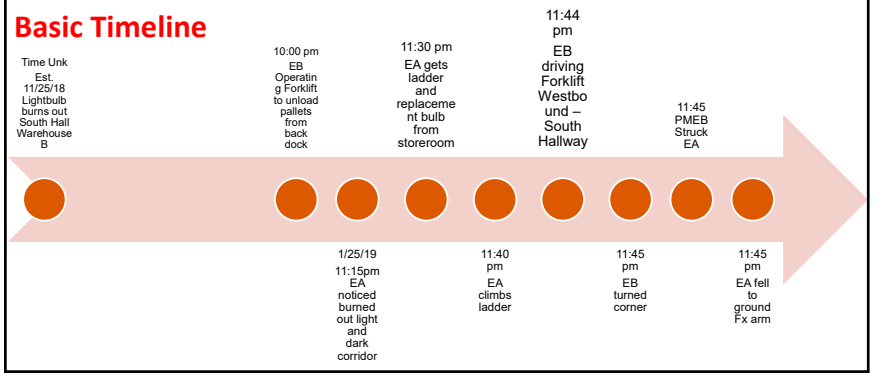
Employee (B) was driving a forklift westbound in the south hallway. He turned the corner by the employee breakroom, but did not see employee A on the ladder. Employee B struck the ladder, causing Employee A to fall to the ground causing injury.

38

Establishing a Timeline

39

Basic Timeline



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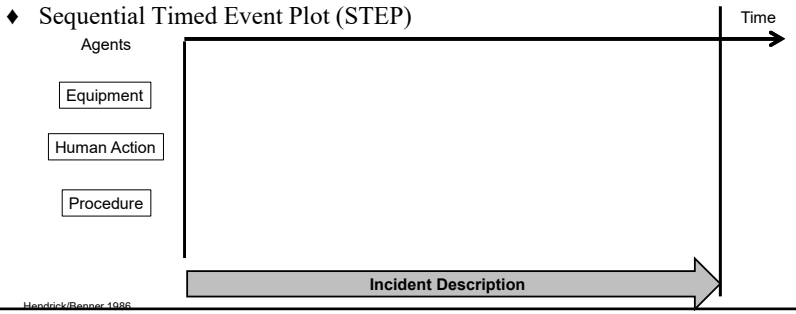
The Investigation System – Develop a Timeline

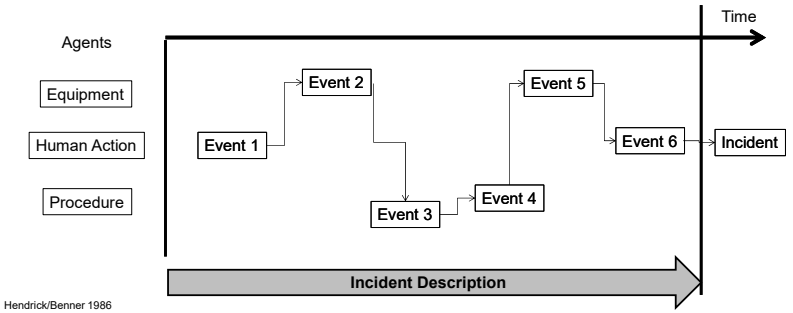
- Sequential Timed Event Plot (STEP)



Hendrick/Benner 1986

41

Sequential Timed Event Plot (STEP)



Hendrick/Benner 1986

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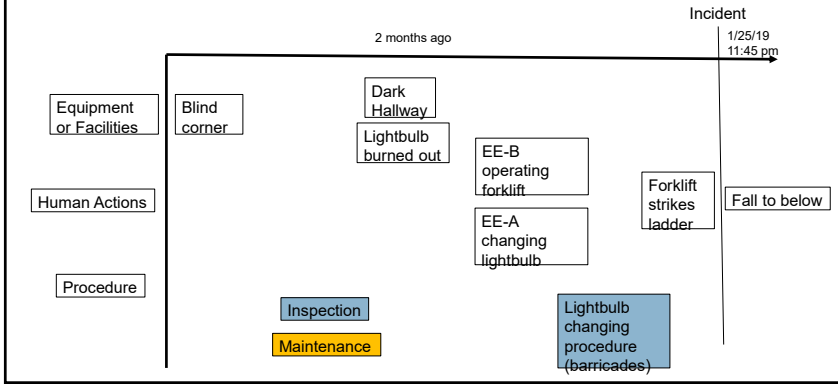


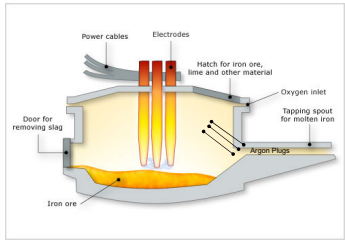
43

Incident Timeline – Case Study

An incident occurred in the melting area of an electric steelmaking operation where there was an electric arc furnace (EAF); the EAF was equipped with three porous plugs, located on the bottom part of the furnace, for blowing Argon into the molten bath to homogenize the steel.

The furnace was de-energized and locked out to allow maintenance operations; including shutting off of the Argon supply to the furnace.

The maintenance manager, worker (A), authorized the lockout procedure prior to the commencement of work and both the charge and slag doors of the furnace were opened. Thirteen days after the lockout was completed, three workers (A, B, and C) did an inspection in the furnace to plan the maintenance work.



Electric Arc Furnace

44

Incident Timeline – Case Study

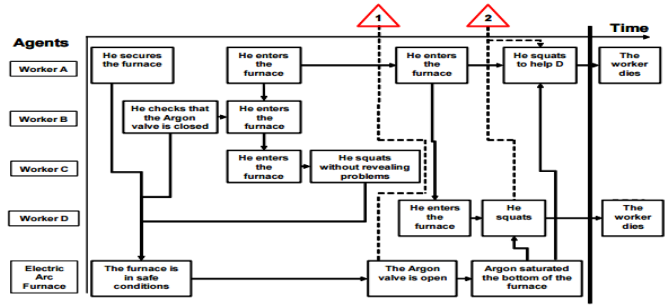
Before going into the furnace, worker (B) checked to ensure the Argon valves were closed. During this inspection, worker (C) squatted twice to collect some materials from the bottom of the furnace, without any difficulties. One day later, the maintenance manager, worker (A), and worker (D) were seen outside the furnace ready to perform the maintenance. After about 20 minutes, they were found dead inside the furnace.

Once they have entered in the furnace, they began to make repairs on the upper part of the oven (time estimated for the activity: 10-15 min); at a certain point, one of the workers, probably (D), squatted to change the disk of the grinding wheel. Because the Argon valve has been opened (it is unknown how the valve was opened), the bottom of the furnace (between the floor and the slag door, located at about 4 ft from the sole) was saturated by the gas, given that it is heavier than air.

Under these conditions, in a low oxygen environment, worker (D) lost consciousness and his death occurred within a few moments. Worker (A) saw him on the ground, he knelt to help him but he lost consciousness also and subsequently died.

45

Case Study – STEP diagram



46

The Incident Investigation Process

47

FPST 3013 – Safety Management

The Incident Investigation Process

Lecture 6

Investigative Techniques

48