



Collaborative Bachelor's Degree Program of Fire Protection and Safety
Engineering Technology between Southwest Jiaotong University and
Oklahoma State University, U.S.A.




FPST 1213 Fire and Safety Hazard Recognition

Inspection Procedures

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Inspection vs. Audit



- Inspection
 - Internal and external
 - Detect potential hazards before incidents occur
 - Field Verification Inspections
- Audit
 - Typically external
 - Different from an inspection
 - In addition to an inspection, it's a deep dive

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Inspectors and Auditors



- Safety professionals
- Front-line supervisors
- Safety committees
 - Employee involvement
- Third-parties
 - Fire Marshal
 - Insurance companies
 - OSHA
 - EPA (ODEQ)

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Types of Internal Inspections



- Periodic – equal intervals
 - Advantage – trends can be seen
 - Disadvantage – they know you are coming
- Intermittent – unequal intervals
 - Advantage – piece of reality, don't see you coming
 - Disadvantage – can't always see improvement if only done "as needed"
- General – comprehensive inspections, often annually or biennially
 - Inspect places not ordinarily seen
 - Inspect all places, night and day

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Planning for Inspections



- Questions to ask
 - What items need to be inspected?
 - What aspects of each item need to be examined?
 - What conditions need to be inspected?
 - How often must items be inspected?
 - What is the risk?
 - How quickly can the risk escalate?
 - What is the incident past history?
 - Who will conduct the inspections?

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What Needs to be Inspected



- Examples
 - Environmental factors
 - Hazardous materials
 - Production equipment
 - Safety devices and guards
 - Controls
 - Electrical parts
 - Power source equipment
 - PPE
 - Storage facilities
 - Transportation equipment

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Fire Inspection Item Examples



- Access and Premises
 - Exterior access clear
 - Fire department connection clearly visible and accessible
 - Fire hydrants visible and accessible
- Means of Egress
 - Exit doors are visible, accessible, and fully functional
 - Exit doors readily open from the inside without the use of a key or special effort
 - Fire doors are self-closing and latch in the closed position

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Fire Inspection Item Examples



- Electrical
 - Cover plates installed on all electrical receptacles
 - Circuits are labeled on all electrical panels as to what they control
 - 30 inches of clear access in front of all electrical panels
 - Extension cords used only for temporary power
 - All extension cords should be grounded
 - If multiple items are plugged in, power strips with built-in circuit breakers are used, and are plugged directly into a permanent receptacle

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Fire Inspection Item Examples

- Egress Lighting
 - All means of egress are properly illuminated
 - All emergency lighting units are operable and located to illuminate all portions of the means of egress
 - All exit signs are properly illuminated and battery back-up operates
- Fire-Alarm System
 - Annual fire-alarm system functional performance test is completed, along with a record of completion

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Fire Inspection Item Examples

- Fire Extinguishers
 - Generally, fire extinguishers are within 75 feet of all areas of the building
 - All extinguishers are visible and accessible
 - All extinguishers inspected within the past 12 months
- Fire-Sprinkler System
 - Annual fire-sprinkler-system inspection, testing, and maintenance is complete, along with a record of completion
 - Generally, all storage located at least 18-inches below all fire sprinklers

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Fire Inspection Item Examples

- Heat-Producing Appliances and Devices
 - Only UL-listed portable electric heaters used
 - At least 36 inches of clearance
 - All gas-fired heat-producing appliances (furnaces, water heaters, etc.) at least 36 inches of clearance on all sides
 - All gas-fired heat-producing appliances are vented
- Storage and Maintenance
 - All trash and waste removed from the building daily
 - All oily rags or similar materials are stored in approved metal containers
 - All combustible or flammable liquids should be properly stored in approved containers or cabinets

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Conducting Inspections



- Inspection preparation as a third-party
 - Site familiarization
 - Personal appearance
 - Equipment list – pg. 700
 - Inspection record review
 - Permits
 - Previous complaints
 - Complaint management - Procedure for receiving and processing complains are typically found in (SOP's)
 - Previous violations
 - Specific hazards at location

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Conducting Inspections



- Guidelines for inspections
 - Display identification if you are a third-party
 - State the reason for the visit
 - Follow a written procedure

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Conducting Inspections



- General inspection practices
 - Divide facility into physical spaces, i.e., rooms, warehouses, etc.
 - Divide large areas into smaller more manageable areas
 - Typically performed in a certain order to ensure complete examination of the facility
 - Exterior and general information first
 - Conditions, barriers or instructions
 - Locations of hydrants alternative of water sources
 - Building name and address
 - Type of occupancy
 - Proximity to potential exposures
 - Construction, renovation, or demolition activities

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Conducting Inspections



- General inspection practices (cont.)
 - Methods
 - Start from the roof and work down
 - Start from the basement and work up
 - Follow established process that is within the structure
 - manufacturing lines
 - Photographs
 - Some facilities may not allow photographs. The inspector should follow department policies for record-keeping

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The Inspection Form



- Write each item inspection item as objective as possible
 - Easier to train
 - Easier to understand
 - Ensures consistency

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PPE

- A1 Associates are wearing the required plant PPE. (Steel Toe Shoes, Hearing Protection, Safety Glasses)
- A2 Task specific PPE is available
- A3 Task specific PPE is being worn according to task being performed (e.g. face shield when grinding)
- A4 An eye wash/shower facility is located within 100 feet of bulk chemical use storage.
- A5 Signs are posted in chemical areas specifying PPE requirements.
- A6 The path to an eyewash/showers facility is unobstructed.
- A7 Replacement hearing protection is available.
- A8 Respirators are stored to prevent damage and to be kept clean.
- A9 Hot parts have a sign posted that states "Caution Hot Parts".
- A10 Plant approved utility knives that are orange, red or black.

Fire Protection

- B1 Fire extinguishers are available and ready for use. (charged and accessible)
- B2 Extinguisher locations are marked as having an extinguisher.
- B3 Fire door rails are not damaged and allow the door to close completely.
- B4 Fire door fusible links are clean and unpaired.
- B5 Sprinkler heads that are exposed to mechanical damage are protected by metal guards.
- B6 House keeping is maintained allowing for no trash to accumulate in work areas or stations (e.g. electrical utility rooms).
- B7 Oily rag waste containers are labeled as such.
- B8 Access to utility & equipment rooms is restricted to unauthorized employees by a locking device.

Walking and Working Surfaces

- C1 Designated aisles and passageways are kept clear and unobstructed.
- C2 Walking surfaces 48 inches or more above the floor are provided with standard guardrails (42" top rail, 21" midrail, 4" toe board).
- C3 Materials on elevated surfaces are stored in a manner to prevent falling, collapsing, rolling, etc.
- C4 Standard stair rails or handrails are on all stairways having four or more risers.
- C5 Steps on stairs are slip resistant.
- C6 Stairs that exit into vehicle aisles have barriers provided to prevent stepping into the path of traffic.
- C7 Floor or wall openings over 4" are guarded by a cover, guardrail, or equivalent means.
- C8 Wet surfaces are covered or provided with non-slip materials.
- C9 Fork truck lanes properly marked.
- C10 Stairs and permanent ladders are unobstructed.
- C11 Fluid drains are diverted from walkways.
- C12 Pallets are usable and in good condition.

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Ladders

- D6 Permanent ladders 20 feet or taller are equipped with cages.
- D7 Ladders have no loose, damaged or broken parts.
- D8 Top access to permanent ladders are chained or barred.
- D9 Top access to permanent ladders are clear of material and debris.

Exiting and Egress

- E1 Exits are marked with an exit sign and are illuminated. (power source must have battery backup)
- E2 The directions of exits, when not immediately apparent, are marked with visible signs.
- E3 Exits are free of obstructions.
- E4 Doors, aisles or stairways that are not exits, or access to exits are appropriately marked "NOT AN EXIT".
- E5 Emergency exit routes are posted.
- E6 Emergency exits are unlocked.
- E7 At least one Exit Sign is visible from all areas.
- E8 All doors are labeled with a "Exit, No Exit or To Exit" sign.

Hazard Communications

- F1 Hazardous substance containers are labeled with product identity, hazard warning and required PPE. (HMS Label)
- F2 Employees know where to find MSDS's for the materials they work with (ask a minimum of 5 people).
- F3 MSDS's were found for 3-5 materials in the area.
- F4 There are no open top containers.
- F5 Work areas are free of glass containers.
- F6 Employee's have their Health and Safety Guide accessible (ask minimum of 5 people)

Industrial Trucks

- G1 Powered vehicles are inspected and have current vehicle inspection sheets properly filled out.
- G2 Operators of powered industrial vehicles have their operator's license on their person.
- G3 Operators of powered vehicles are wearing seat belts.
- G4 All LPG trucks are equipped with an ABC fire extinguisher that is mounted to the vehicle.
- G5 Travel routes for powered vehicles are clear and have no vision obstructions.
- G6 When semi-trailers are being loaded and unloaded the trailer wheels are chocked or dock lock system is utilized if

Electrical

- H1 Portable electric hand tools and equipment are grounded or double insulated.
- H2 Extension cords being used have a grounding conductor.
- H3 No exposed wiring or cords with frayed or deteriorated insulation are in use.
- H4 Hard or flexible conduit is not worn or damaged.
- H5 Flexible wiring extension cords used in permanent settings do not exceed 6 feet in length.
- H6 Disconnect switches and circuit breakers are labeled to indicate the equipment served.

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Auditing Steps



- In addition to an inspection:
 - Procedure review
 - What do they say they will do?
 - Are they doing what they say?
 - Example - Emergency planning and preparedness
- If you are a company employee, include recommendations for improvement

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Findings



- Compliance violations
 - Regulatory violations
- Opportunities to improve

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Findings



- Violation discussion
 - The most difficult aspect of dealing with people is discussing unsafe conditions and safe behaviors or violations that have been noted
 - Never assume that an owner/occupant is ignorant of the codes
 - Remain polite but firm
 - If you are a third party or working for a municipality, do not attempt to recommend let alone design a solution

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Communication



- Take advantage of educational opportunities during inspections to help positively influence behavior
- Letters and reports
 - Use proper formatting and grammar during written communications
 - What does proper mean?
 - Follow writing rules
 - Do not write the way you speak
 - Keep it professional

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Communication



- It's all about the wording
 - The guard is unsafe
 - There are no unsafe items in the area
 - The guard is adequate
 - Proper PPE is not being used
 - Adequate PPE is not available
- What's wrong with the above documented inspection findings?

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Regarding internal inspections, it
is not about violations, problems,
issues, etc....it is about finding
opportunities to improve
