3151

Safety Inspection Guide

MOD III

(A SYSTEMATIC APPROACH TO
CONDUCTING A SAFETY INSPECTION)

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SAFETY ADMINISTRATION - 3441

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Sandia Laboratories

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FOREWORD

The industrial workplace of today holds great potential for creating hazards. Because so many operations can contribute hazards/exposure, safety/health programs that aim at minimizing these hazards must be comprehensive and systematic.

One small part of a total safety/health program is the periodic safety inspection of the workplace, of employee activity, and of management programs and implementation (accident prevention-compliance, etc.). Hazardous conditions must be identified by supervisors, by employees, and by professional staffs (experts).

Hazards that can be abated, should be; and employees should be protected against those hazards which cannot be abated.

The use of this guide is optional; however, it is designed to assist the user in performing a more comprehensive survey and in arriving at better control of potentially hazardous or accident-producing environments.

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MASTER

ABSTRACT

This guide was developed as a comprehensive/systematic approach to the problem of performing a safety inspection. Five basic sections (categories) are considered in the guide:

- A. Physical Work Place
- B. Machines/Mechanical Equipment
- C. Hazardous Materials/Processes/Environments
- D. Energy Sources
- E. Management Hazard Control Factors

The basic concept is that one starts evaluating hazard potentials from the physical work place and continues considering other elements as they are added to the physical work place. This approach provides a better understanding of the interfaces of each section to the entire group.

The guide is supported by an "Area Safety Inspection Result" form to record defects or conditions found, the evaluation (best estimate) of the urgency or priority for correcting deficiencies or areas of noncompliance, and the status of corrective action.

Additionally, the guide serves as an educational tool in accident prevention for supervisors and employees.

A useful visual tool (Profile Chart) is enclosed in Appendix C. This Profile Chart provides important visibility to the Safety Inspection process. The user is able to review his findings, present them to others, alter or revise as additional facts warrant, and document the total effect for later use.

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- C. Profile Chart
- D. Typical Energy Source

SAFETY INSPECTION GUIDE

I. Responsibilities and Requirements

A. Policy

First-line supervisors have the direct responsibility and will be held accountable for the safety of employees, facilities, and the operations they supervise.

Comprehensive safety inspections will be conducted on a routine basis. The inspections shall be documented and reported to the Safety Organization.

B. Procedure (Ref: SC-M-889, Industrial Safety, Fire Protection and Environmental Safety Manual)

Each supervisor shall take the initiative in establishing and maintaining safe and healthful practices and work environments.

Inspection of work areas:

Make daily observations of work areas/operating conditions.

Conduct periodic systematic inspections of entire work area(s) at least semiannually.

Record conditions noted on forms available from the Safety Organization.

C. Safety Monitoring and Reporting to Management

A computer record of Safety Inspections exists for each division-size organization (except SLL).

Monthly reports are made and distributed to Safety Organization consultants who share this information with line organizations.

Each July and January, a list of organizations who have not complied with the semiannual requirement (minimum) is sent to the concerned director for review and/or appropriate action.

II. General Information and Approach

Comprehensive/systematic safety inspections ideally require that all factors likely to be encountered are included and that a methodology or criteria be

established and followed. This Guide was designed with the above goals in mind; however, certain practicalities were also considered and are part of the design.

Some redundancy may be noticed. This was intentional. It is better to ask a question several times to uncover hazards because of the particular configuration or categorization of this document and since some questions/areas will not be applicable to all users.

It is possible that the first time that the Guide is applied (used in an inspection), it will require some additional time and effort. Repeat inspections should require less time.

Do not hesitate to consult qualified persons for information, discussion of problems, or compliance questions. Professional staffs and applicable codes are available in Safety, Environmental Health, and Plant Engineering.

Compliance with codes, standards, etc., for the "Physical Work Place" (III.A) is primarily the responsibility of the Plant Engineering Department. Therefore, the user of this document at Sandia will probably find it unnecessary to contact them; however, known deficiencies should be reported.

The "Profile Chart" (Appendix C) is enclosed as an additional tool for use following an inspection and completion of Appendix A.

III. Information/Questions (What to Look At/Look For)

A. Physical Work Place (includes plant and environment applicable to where employee(s) work)

A. 1. Building(s)

- a. Is the building functional/adequate for current operations?
- b. Is the building structurally sound?
- c. Are the floors overloaded?
- d. Are roofs/ceilings overloaded?
- e. Are load limits posted where required?
- f. Does the roof leak?
- g. Are there any obvious defects which present hazards to the work force (wall cracks, loose brick/tile, etc.)?

A. 2. Heating

- a. Does the heating system/furnace/heater comply with applicable codes, standards, etc.?
- b. Is the heat provided adequate for reasonable comfort?

- c. Is the location/arrangement such that adequate fire prevention/protection may be obtained?
 - d. are barriers/guards provided to protect from burns, electric shock, etc.?
- A. 3. Cooling
 - a. Does the system comply with applicable codes/standards, etc.?
 - b. Are portable fans guarded? Secured from tipping or falling?
- A. 4. Illumination
 - a. Does the system comply with applicable codes/standards, etc.?
 - b. Is the light adequate to perform assigned tasks safely?
 - c. Is emergency lighting provided where applicable?
 - d. Are temporary lights equipped with guards?
- A. 5. Sanitation
 - a. Does sanitation in the area comply with applicable codes/standards, etc.?
 - b. Is insect/rodent protection provided?
 - c. Are sufficient approved waste disposal containers provided?
 - d. Are washing facilities provided adequate, especially for dirty/dusty exposure situations?
 - e. Are other sanitary facilities adequate and in good repair?
- A. 6. Ventilation/Exhaust
 - a. Does the system comply with applicable standards/codes, etc.?
 - b. Are exhaust systems adequate for special operations/hazardous processes/noxious fumes/contaminants and/or particulates?
 - c. Do windows/vents operate properly? In good condition?
 - d. Are filters periodically changed and collector bags periodically emptied?
 - e. Are there any conditions where eye irritation is encountered upon entering a room/building or structure?
 - f. Are there any visible clouds/dust clouds coming from the vent systems?
- A. 7. Water
 - a. Do water supplies comply with applicable codes/standards, etc.?
 - b. Is unwanted water a problem (roof leak, plugged drain, water in electrical equipment, water on floor, poor drainage)?
 - c. Is necessary required water available (cleaning, drinking, flushing, cooling, etc.)?

A. 8. Egress/Exits

- a. Do entrances/exits comply with applicable codes/standards, etc. (amount, marked/labeled, lighted, etc.)? In good repair.
- b. Is there a view port/glass for heavy traffic exit doors?
- c. Is access free and clear? Unobstructed?
- d. Do employees know proper exit routes?
- e. Do all exterior building exits discharge directly to street or other open space?

A. 9. Pressure Vessels/Boilers

- a. Do boiler systems comply with applicable codes/standards, etc.?
- b. Are periodic inspections conducted by qualified personnel?
- c. Maintenance logs on site?
- d. Safe Operating Procedures on site?
- e. Relief devices adequate? Tested? Certified?
- f. Is protective equipment provided when applicable?
- g. Approved water column provided?
- h. Are gauges provided and is glass guarded?

A. 10. Piping

- a. Does piping comply with applicable codes/standards, etc.?
- b. Are company color-coding labeling schemes followed?
- c. Are applicable piping systems secured as required?
- d. Are adequate control and relief devices provided?

A. 11. Walking/Working Surfaces

- a. Do walking/working surfaces comply with codes/standards, etc.?
- b. Are safe aisles, walkways, stairs provided and maintained?
- c. Are handrails and toeboards provided?
- d. Do floor surfaces provide a safe place to stand/walk?
- e. Does the height of a surface present a problem?
- f. Do ladders/step stools, etc., comply with all safety requirements?
- g. Where applicable, are special mats/gratings provided?
- h. Are special work areas protected against slipping/tripping/falling hazards?
- i. Are floor openings guarded?
- j. Are spillages cleaned up immediately?

- k. Are there procedures for snow and ice removal before employees arrive for work?
- l. Are these surfaces maintained free of obstructions/objects, etc.?
- m. Are stair treads/risers in good condition and of uniform width and height?
- n. Are applicable permanent aisles/passageways appropriately marked?
- o. Are portable wood/metal ladders adequate for purpose, in good condition and provided with secure footing?
- p. Are fixed ladders adequate, equipped with side rails or special climbing devices where required?
- q. Are dock plates kept in serviceable condition and secured to prevent slipping?

A. 12. Elevators

- a. Do elevators comply with applicable codes, standards, etc.?
- b. Do elevators have emergency lighting? Controls? Communication?
- c. Are shafts barricaded when construction/modifications or repairs are being made?
- d. Are certificates of inspection posted?
- e. Are load capacities/operating speeds/hazard warnings posted?

A. 13. Power Sources

- a. Do the various power source systems comply with applicable codes, standards, etc. (electrical/steam/air, etc.)?
- b. Are service outlets adequate and in good repair?
- c. Are adequate/required barriers provided?
- d. Are required labels and warnings provided?

A. 14. Fire Protection Systems

- a. Do fire protection/control systems comply with codes, standards, etc.?
- b. Are sprinklers provided? Other suppressant chemicals, sand, etc.?
- c. Are there emergency warning devices?
- d. Is there an evacuation plan? Tested?
- e. Are fire teams provided?
- f. Is there a plan/practice to control flammables/wastes, etc.?

- g. Are adequate containers provided?
- h. Are fire extinguishers conspicuously located and readily accessible?
- i. Are extinguishers periodically inspected and tagged to show date of maintenance of recharge?
- j. Are fire alarm systems periodically tested?
- k. Are employees periodically instructed in fire protection procedures?
- l. Are sprinkler heads protected by metal guards where exposed to mechanical damage?
- m. Are portable fire extinguishers provided in adequate number and type?
- n. Are oil and gas-fired devices equipped with flame failure controls?
- o. Is a minimum of 4 feet clearance maintained in front of heating equipment/radiant heaters, etc.?

A. 15. Ground(s)

- a. Do plant facility grounds comply with applicable codes, standards, etc.?
- b. Are there obvious falling or tripping hazards (holes, pits, rock obstructions, etc.)?
- c. Is there adequate lighting for pedestrian movement?
- d. Are there any tree branches extending over sidewalks?

A. 16. Sidewalks

- a. Do sidewalks comply with applicable codes, standards, etc.?
- b. Are there obvious tripping/falling hazards?
- c. Are walks in good repair?
- d. Are surfaces adequate to meet changes in season and weather?
- e. Are there any obstructions extending out over the sidewalks?

A. 17. Streets/Roads, etc.

- a. Do company streets comply with applicable codes, standards, etc.?
- b. Are there obvious defects in the streets/roads (chuck holes, ditches, etc.)?
- c. Are there adequate traffic lanes/markings/stop signs and traffic control devices?
- d. Are speed limits posted? Enforced?
- e. Are there any interface problems among/between vehicles and pedestrians?

A. 18. Parking Lots

- a. Do company parking lots comply with applicable codes, standards, etc.?
- b. Are there adequate markings? Traffic controls/signs, etc.?
- c. Are the surfaces adequate for changes in season/weather?
- d. Are speed limits posted and enforced?
- e. Are there any obvious tripping or falling hazards?
- f. Is there adequate lighting at night?

B. Machines/Mechanical Equipment (includes all types used by, operated by employees in performance of assigned tasks)

B. 1. Conveyor Systems (See also B.4.)

- a. Do material or passenger systems comply with codes, standards, etc.?
- b. Are adequate barriers/guards/controls provided?
- c. Are periodic inspections made?
- d. Are maintenance logs available?
- e. Are operating instructions on site?
- f. If automatic, are there emergency shut-off controls? Periodically tested?
- g. If passenger carrying, is the surface free of tripping, falling hazards?
- h. Are there adequate cautions/warnings posted?
- i. Are workers protected from dislodged materials?

B. 2. Engines (See also B.6.)

- a. Do engines comply with applicable codes, standards, etc.?
- b. Are adequate barriers/guards/controls provided?
- c. Are periodic inspections made?
- d. Are maintenance logs available?
- f. Are emergency shut-offs provided?
- g. Are adequate caution/warnings posted?
- h. Are adequate provisions made to safely dispose of harmful by-products/exhausts, etc.?

B. 3. Guns/Firearms

- a. Do guns (and their use) comply with applicable requirements?
- b. Is there an adequate Safe Operating Procedure on site or available to the user(s)?
- c. Are there periodic safety inspections by qualified persons?

- d. Are there adequate barriers/guards to control shrapnel?
- e. Are there adequate caution/warnings posted?
- f. Are rotating/moving parts color-coded, guarded, etc., for protection of operators?
- g. Is adequate protection provided for casual visitors, observers, etc.?
- h. Are there adequate controls for interfaces with other energy sources?

B. 4. Hoist/Crane/Winch (See B.1)

- a. Do the various lifting/moving devices comply with applicable codes, standards, etc.?
- b. Are operators trained and/or certified?
- c. Are periodic inspections made?
- d. Are maintenance logs available?
- e. Are operating instructions on site?
- f. Are emergency shut-offs provided?
- g. Are cautions/warnings posted?
- h. Are load limits posted?
- i. Is equipment in good repair?
- j. Are adequate barriers and guards provided?
- k. Is associated equipment (slings, etc.) inspected before use? Is it adequate and in good repair?
- l. Are crane hooks provided with safety latches?
- m. Are control functions clearly marked for all pendant control boxes?

B. 5. Machinery

- a. Is all machinery installed/safe-guarded/operated/maintained in compliance with specified requirements?
- b. Are periodic inspections made?
- c. Are maintenance logs available?
- d. Are operating instructions on site?
- e. Are adequate emergency shut-offs provided? Tested?
- f. Are adequate barriers/guards provided?
- g. Are operators/personnel fully instructed and trained?
- h. Are hazardous by-products/environments adequately controlled?
- i. Are adequate cautions/warnings posted?

- j. Are tool rests properly adjusted?
- k. Are machines restrained/secured/anchored to prevent walking/tipping/moving?
- l. Are starting/stopping mechanisms provided and in good working order?
- m. Are machines operated in compliance with recommended operating speeds?
- n. Are operator-actuated controls clearly identified and located within easy reach of operator work station?
- o. Are the various actuating means protected from unintended operations?
- p. Are electrical control circuits protected against shorts (unintended operation)?
- q. Are applicable machine braking systems operable/in compliance/and monitored for correct operation?
- r. Are the machine control devices strategically located to prevent inadvertent striking against while moving about the machine or by casual passers by?

B. 6. Prime Movers (See B.2)

- a. Do mechanical power sources comply with applicable codes, standards, etc.?
- b. Are operators trained and/or certified?
- c. Are periodic inspections made?
- d. Are emergency shut-offs provided?
- e. Are operating instructions on site?
- f. Are cautions/warnings posted?
- g. Are adequate barriers/guards provided?
- h. Are harmful byproducts adequately controlled?

B 7. Power Transmission Systems

- a. Do gears, sprockets, belts, etc., comply with applicable codes, standards, etc.?
- b. Are adequate guards/barriers provided for pinch points, ingoing nip points, etc.?
- c. Are emergency shut-off controls provided?
- d. If a color-coding scheme is used for rotating/moving parts, is it consistent throughout the plant?
- e. Are adequate cautions/warnings posted?

B. 8. Powder Tools (Explosive Actuated)

- a. Do powder tools comply with applicable codes, standards, etc.?

- b. Are tool operators trained?
- c. Is a Safe Operating Procedure required?
- d. Are periodic inspections made?
- e. Are controls/barriers sufficient to protect casuals/nonoperating personnel?
- f. Are adequate storage containers/places provided?
- g. Is adequate eye protection provided?

B. 9. Vehicles

- a. Do vehicles, which move/carry material and people comply with applicable codes, standards, etc.?
- b. Are operators trained? Licensed? Authorized?
- c. Are periodic inspections made of operational safety items (brakes, lights, horn, wipers, etc.)?
- d. Are operating instructions clear and adequate?
- e. Is the equipment in good repair?
- f. Is vehicle left unattended with motor running?
- g. Are emergency provisions clear and adequate?
- h. Are accidents investigated and reported promptly?
- i. Are protective devices provided (roll-over bars, seat belts, chocks, etc.)?
- j. Are keys removed from unattended vehicles?
- k. Are vehicles locked in unsecured areas?
- l. Are nonmotor carts, etc., stable and in good condition?
- m. Are safe work practices followed?
- n. When parking, is the parking legal?
- o. Is transmission placed in proper gear and is emergency brake engaged?
- p. Is proper vehicle/handling gear used for applicable task/situation?

C. Hazardous Material/Processes/Environments (includes all used by, performed by, or existing where employee performs assigned tasks)

C. 1. Acids/Caustics

- a. Does the use and storage of acids/caustics comply with all requirements (codes, standards, policies, etc.)?
- b. Are adequate provisions made for and provided as barriers, protective clothing, fume hoods, etc.?
- c. Is adequate ventilation/exhaust provided?

- d. Do containers/storage and amounts comply with specified criteria?
- e. Are required emergency flushing/drenching facilities provided? Nearby?
- f. Are users properly trained?
- g. Are safe work practices/procedures followed?
- h. Is there an adequate Safe Operating Procedure available to the user/processor?

C. 2. Combustible/Flammable

- a. Does use and storage of combustible/flammable material comply with all requirements?
- b. Are approved containers available and used?
- c. Where appropriate, is there a Safe Operating Procedure available to the user of combustible material?
- d. Are fire extinguishers/control devices/suppressants readily available to the user of combustible material? Where stored?
- e. Are storage quantities specified and limited?
- f. Are containers/storage areas color-coded or labeled as to contents?
- g. Are adequate caution/warning labels provided and posted?
- h. Are control measures provided for leaks, preventing unwanted mixtures of materials, heating, or overpressurizing containers, etc.?
- i. Where applicable, are bonding and grounding provided?
- j. In cleaning operations, is the required protective equipment provided?
- k. Are measurements made for oxygen deficient or toxic environments before the start of cleaning operations?
- l. Are personnel knowledgeable of the material they use and of the possible effects where mixtures may occur?
- m. Are emergency drainage systems provided for safe disposal?
- n. Is liquid transfer by approved piping/pumping means?

C. 3. Cryogenics

- a. Do cryogenic materials/uses/processes, etc., comply with all requirements?
- b. Are controls sufficient to prevent/minimize burns and oxygen deficient atmospheres?
- c. Are the action people cognizant of the hazards associated with these materials/processes?

- d. Where applicable, is there a Safe Operating Procedure available to the action person?
- e. Are the required barriers/guards/protective clothing provided and used?
- f. Are interfaces with other forms of energy analyzed?
Are sufficient controls provided for unwanted energy flow?
- g. Are appropriate cautions/warnings/labels provided/posted?

C. 4. Explosives/Pyrophorics

- a. Do explosive operations/facilities/quantities, etc., comply with all requirements?
- b. Do all explosive operations/uses have up-to-date adequate Safe Operating Procedures available to the action person?
On site?
- c. Is the action person(s) familiar with the SOP content?
- d. Have the users/testers/handlers of explosives been adequately trained?
- e. Are the permissible levels/limits/quantities of explosives adhered to?
- f. Are the barriers/barricades/distances/controls sufficient to protect functional and nonfunctional personnel?
- g. Are adequate signs/warnings/labels provided and posted?
- h. Are adequate storage containers/places provided?
- i. Are special requirements documented and made known to all personnel involved in handling, transporting, and storing explosives?
- j. Are explosive tests/operations in outside areas shut down when potential gradient meets/exceeds a specified value?
- k. Does the operational plan call for a safety factor corresponding to the dangers involved?
- l. Is adequate protection provided against unexpected detonation of explosive devices?
- m. Are special precautions provided in systems combining explosive detonators and rf or microwave systems?
- n. Has special protection or remote viewing been provided for observing items under test that are subject to structural failure?
- o. Is suitable venting provided where there are effluents from substances that are burned, exploded or subject to dissociation while under test?
- p. Does the design plan make adequate provision for control of shock waves/noise, etc.?

- q. Are there adequate provisions for the safe disposal of debris after a test?
- r. Are there periodic inventories made of stored explosives? Documented?

C. 5. Oxidizing Agents

- a. Is the use, handling and storage of oxidizing agents in compliance with all specified requirements?
- b. Are the agents stored separately from fuels?
- c. Are appropriate/limited size containers used?
- d. Is appropriate protective equipment provided and used?
- e. Are spills of oxidizing agents cleaned up immediately?

C. 6. Reactive Chemicals

- a. Are activities involving the use/handling/storage of reactive chemicals in compliance with all specified requirements?
- b. Are personnel adequately trained?
- c. Are controls adequate to prevent unwanted reactions due to fire, pressure, heat, water, mixtures, etc.?
- d. Are contents adequately labeled, etc.?
- e. Are cautions/warnings adequately posted?
- f. In case of fire/emergency, do all personnel know exactly what to do? Evacuate? Call for help? Or what?

C. 7. Surface Preparation, etc.

- a. Is the safest cleaning/preparation agent used?
- b. Are adequate barriers/protective clothing provided and used?
- c. Are personnel adequately trained?
- d. Where applicable, is adequate ventilation/exhaust provided?

C. 8. Toxic

- a. Are activities involving toxic environments in compliance with specified requirements?
- b. Are personnel knowledgeable of the hazards involved with their specific applications?
- c. Are ventilation/exhaust systems adequate for specific applications?
- d. Are barriers/protective equipment, etc., adequate for specific applications?

- e. Where applicable, is there a Safe Operating Procedure available to the action person?
- f. Are adequate washing/flushing/cleaning facilities provided?
- g. Are approved containers and quantities used and adhered to?
- h. Are disposal facilities controlled and adequate?
- i. Are adequate cautions/warnings/labels provided and posted?
- j. Does age of the facility or equipment pose a problem?
- k. Are approximate exposure levels in permanent work areas posted/monitored or are employees orally informed of approximate levels?

C. 9. Compressed Gases/Liquids

- a. Do containers use/storage comply with all requirements?
- b. Are periodic visual inspections conducted?
- c. Are cylinders grouped by type?
- d. Are groups segregated as to compatibility?
- e. Where removable caps are provided for valve protection, are such caps on cylinders at all times except when in use?
- f. Are cylinders properly stored/secured?
- g. Are valves closed except when in use?
- h. Are specified criteria met for bulk storage facilities/for special gases/liquids as to amount/distance/location, etc.?
- i. Do storage facilities comply with specified criteria?
- j. Are containers properly labeled as to contents?
- k. Are adequate cautions/warnings posted?
- l. Are threads on regulator control connections compatible with cylinder valve outlets?
- m. Is the age of the container/facility a problem? How about the condition?
- n. Are hose/connections adequate for pressure and service requirements?
- o. Are self-contained breathing apparatus available in case of toxic gas leaks?

C. 10. Pressure Systems

- a. Are activities involving pressure/vacuum/volume in compliance with specified requirements (air, steam, gas, etc.)?
- b. Are personnel adequately trained for specific application?
- c. Are adequate guards/barriers/control devices provided?

- d. Are adequate relief devices provided (pressure and flow ratings)?
- e. Is the safest energy form used?
- f. Is there a schedule for inspection/maintenance?
- g. Are logs of maintenance/inspection available on-site?
- h. Are emergency shut-offs provided?
- i. Is there a Safe Operating Procedure on site and available to the action persons?
- j. Is there a change review process whereby control measures can be updated?
- k. Are adequate gauges and gauge-guarding provided?
- l. Is the safety factor a minimum of 4 for all elements in manned areas?
- m. In high-pressure systems are all lines tied down to prevent whipping if a failure should occur?
- n. Are lines routed to permit growth and movement as pressure changes?
- o. Are pressure-relief devices placed so that no part of the system can be subjected to pressures greater than the maximum allowable working pressure (MAWP)?
- p. Are interlocks provided for safety shields?
- q. Are gauges required and provided with a range of 1-1/2 to 2 times the working pressure?
- r. Are system materials chemically and thermally compatible with working fluids?
- s. Are fittings compatible with system MAWP?
- t. Are hose lengths kept to a minimum and are hoses rated/matched for proper temperature range?
- u. Has a qualified pressure advisor reviewed the system?

C. 11. Contaminants/Particulates

- a. Is the permissible level of contaminants/particulates in compliance with all requirements?
- b. Are adequate fume hoods/exhausts ventilation systems provided and used for operations/areas creating contaminants/particulates?
- c. Are other adequate control/protective measures required, as protective clothing and equipment?
- d. Are adequate barriers/warnings/control devices provided?
- e. Are appropriate signs, labels and warnings posted?
- f. Where applicable, is there a Safe Operating Procedure available to the action person?

- g. Are periodic inspections/monitorings made for control/safety assurance?
- h. Is exposure to employees kept within allowable limits?
- i. Are adequate flushing/drenching facilities provided?
- j. Are filters periodically changed and are collector bags periodically emptied?

C. 12. Oxygen-Deficient Atmosphere

- a. Have hazard analysis and control measures been made/provided for all activities where supplied oxygen is a life-support requirement?
- b. Are measurements required/provided before entry into enclosed spaces (tanks, holes, tunnels, underground service chase, etc.)?
- c. Where applicable, is adequate shoring/sloping required/provided for pits, excavations, tunnels, etc.?
- d. Is proper/adequate protective equipment provided and used (respirators, life jackets, life lines, oxygen supplies, etc.)?
- e. Are personnel adequately trained?
- f. Is a team approach/buddy system required? Used?
- g. Is a Safe Operating Procedure required?

C. 13. Radiation/Radioactive

- a. Are all activities involving radiation/radioactive equipment, systems, machines, materials, etc., in compliance with specified requirements?
- b. Are energy control techniques part of the use design?
- c. Are barriers/guards/control devices/labels/protective equipment, etc., provided?
- d. Are personnel adequately trained?
- e. Is a Safe Operating Procedure available to the action person? On site? Current?
- f. Is there an emergency plan? Has it been tested?
- g. Are personnel knowledgeable of the plan?

C. 14. Electrical/Electronic

- a. Are all activities involving electric/electronic equipment in compliance with all specified requirements?
- b. Are personnel adequately trained and knowledgeable of the specific application/task?
- c. Are barriers/guards/labels/lights/protective equipment provided? Used? In good condition?

- d. Are the voltage and intended use (electric wiring/apparatus/equipment) shown by standard signs to reduce the hazard or decrease potential operator error?
- e. Is grounding provided as applicable to specific situations?
- f. Are live parts of electrical equipment that operates at 300 volts or more between electrodes and will permit a current in excess of 100 ma AC or 60 ma DC through a 500-ohm load or have stored energy in excess of 15 joules guarded against accidental contact?
- g. Are electrical schematics available and up to date?
- h. Is overcurrent protection provided through applicable devices/systems?
- i. Are these protective devices located or shielded to protect from exposure?
- j. Are the effects of various operating environments considered and controlled (wet, dust, vapors, etc.)?
- k. Are arcing parts of electrical equipment enclosed/isolated as applicable to environment?
- l. Are breakers and switches locked out, grounded, and tagged so that they cannot be energized until repair/modifications are completed?
- m. Are circuits tested for de-energization before repair work/operations proceeds?
- n. Are applicable tools insulated?
- o. Are splices/connections made in approved manner?
- p. Are power input and output terminals covered or inaccessible during normal operations?
- q. Are discharge devices provided to automatically dissipate stored energy before access to the circuit can be made?
- r. Are provisions made for detection and positive indication of failure(s) where failure can create hazards?
- s. Are special precautions/controls provided in systems combining various energy sources?
- t. Are power-operated tools either double insulated or properly grounded?
- u. Are there periodic tests to verify protective systems are operative?
- v. Are circuits wired so that accidental grounding of one line will not cause safety devices to become inoperative?
- w. Are control/measurement circuits separated/isolated from the others?
- x. Are high-voltage circuits isolated from low-voltage circuits?

- y. Are interlock circuits arranged/controlled so that closing a door or access entrance cannot automatically energize the circuit?
- z. Are temporary cords in compliance with specified requirements?

C. 15. Test/Testing

- a. Has a hazard analysis been made and adequate controls provided from initial pilot test to operational test?
- b. Have all special requirements been documented and are all personnel cognizant of the special provisions?
- c. Have interfaces with other equipment, organizations, etc., been taken into consideration? Is there a change review process to update/improve hazard countercontrol measures as conditions change?
- d. Is there a Safe Operating Procedure available and on-site?
- e. Are personnel cognizant of emergency provisions?
- f. Is there a dry run/demonstration to prove out all associated hardware/procedures and to check for oversights?
- g. Is there a plan for safe removal/disposal/storage for leftover material/equipment/etc.?
- h. Are tests performed in sequence and as specified/required to assure hazard-free environment (hydrostatic/de-energize/safe current/assembly/disassembly, etc.)?
- i. Is new material/equipment tested/inspected before being installed/operated?

C. 16. Weld/Cut/Braze

- a. Are welding/cutting/brazing operations in compliance with specified requirements?
- b. Are personnel adequately trained?
- c. Are control procedures adequate to protect functional and nonfunctional personnel?
- d. Are barriers/protective equipment, etc., provided and used?
- e. Are adequate safety devices provided?
- f. Is equipment in good condition?
- g. Are personnel aware of hazards involved when working with certain toxic-producing materials?
- h. Are ventilation/exhaust systems adequate for specific operations?
- i. Are interfaces with other operations compatible (distance, location, environment, etc.)?

- j. Are electrode lead cables frequently inspected and kept in good condition?

C. 17. Material Handling/Moving

- a. Is the activity involving material handling in compliance with all specified requirements?
- b. Are handlers/movers properly trained (lifting techniques hazard recognition, proper use of handling tools/gear, materials compatibility, safe work practices, etc.)?
- c. Is the route over which the material is to be moved inspected for hazards/obstructions?
- d. Is applicable handling gear available and used?
- e. Is protective equipment available and used?
- f. Is the container/material labeled or marked as to contents/weight, potential hazards, etc.?
- g. Is the container in good condition?
- h. Is the shape/bulk/size a problem? Does it require special handling or extra assistance?
- i. Is the material to be handled/moved inspected for potential hazards (wet, greasy, slippery surface, jagged edges, leaking contents, etc.)?
- j. Does prolonged/unusual task requirements (lifting, twisting) increase potential for strains, sprains and other injuries?
- k. If mechanical handling devices are impractical, are the physical limitations of assigned employees ascertained? Matched to the applicable task?
- l. Is the load on vehicles checked for stability? For being secure from tipping/falling?
- m. Are handholds provided (and properly positioned) for equipment that must be lifted or carried?
- n. Does equipment present possible hazards to adjacent personnel and equipment?
- o. Are dock plates kept in serviceable condition and secured to prevent slipping?

C. 18. Storage Areas

- a. Where applicable, do all storage areas comply with specified requirements?
- b. Are storage areas neat, orderly, properly blocked/interlocked/stacked, adequate aisle space, adequate access space, etc.?
- c. For applicable situations, are adequate signs/labels/cautions posted as required?

- d. Where applicable, are distances/locations compatible with other storage, etc., observed?
 - e. Are heaviest/largest items stored on bottom of pile or shelves?
 - f. Are materials stored with due regard to fire characteristics?
 - g. Are weeds/grass kept under control in outside storage areas?
 - h. Are permanent aisles/passageways appropriately marked?
- C. 19. Disposal Waste Areas
- a. Do waste/disposal containers, facilities, systems, and storage areas comply with all requirements?
 - b. Are there specialized procedures provided for disposal of nuclear, toxic, reactive chemicals, etc.?
 - c. Are approved containers provided for paper, metal, petroleum products, chemicals, etc., for handling/storage/transportation?
 - d. Is emergency equipment/protective equipment/specialized handling equipment provided where applicable?
 - e. Are safe disposal dumps provided?
- C. 20. Fragmented
- a. Has a hazard analysis and control measures been made/provided for all activities where material/objects, etc., may fragment (other than planned)?
 - b. Are personnel trained to look for potential shattering of wood, glass, metal, overstressed or overpressured material, deformed or defective handtools, etc.?
 - c. Is the necessary protective equipment provided?
- C. 21. Tensioned Sources
- a. Are personnel aware of hazards involving tensioned sources (coil springs, leaf springs, stressed members, wire cables, etc.)?
 - b. Is there an inspection/maintenance schedule for review of these sources to discover and replace faulty, broken, damaged, defective items?
- C. 22. Sharp/Piercing Objects
- a. Are operations/activities involving power tools, hand tools, metal fabrication, ceramics and plastic or glass fabrication/installation/handling metal furniture/fixtures handling/moving, etc., analyzed for sharp or piercing hazards (unprotected blades/edges, burred edges, broken glass/ceramic/plastic, etc.)?

- b. Where applicable, is protective equipment provided? Used?
- c. Are personnel trained to look for and protect against these hazards?
- d. Are nails, banding material, etc., bent over or pulled/ properly stored to prevent exposure (packing crates, lumber, etc.)?
- e. Are personnel trained to protect/cover blades/cutting tools on power equipment?
- f. Are personnel properly trained to use hand tools (screw drivers, knives, exacto knives, awls, etc.) applicable to assigned task?
- g. Are restraint devices provided for applicable tools?

C. 23. Construction/Modification

- a. Do construction/modification areas comply with all requirements?
- b. Are there interface hazards where personnel are working overhead (dropped tools/material, workmen falling through ceilings, etc.)?
- c. Are there appropriate barricades/warnings around excavations?
- d. Are walkways/aisles kept free of construction material?
- e. Are employees warned/cautioned about hazards associated with construction/modifications?
- f. Are the construction/modification areas inspected/ monitored for safety compliance?
- g. Are safety responsibilities clear for all participants/ tenants, etc.? (Breakdowns and lack of control usually occur at interface points.)
- h. Are the various energy sources properly controlled during various construction phases (electrical, steam, air, water, etc.)?
- i. Are noise and noxious fumes kept below specified limits to minimize personnel exposure?

C. 24. Pits/Excavations/Tunnels

- a. Are activities involving pits, excavations/tunnels in compliance with specified requirements?
- b. Are barriers/warnings provided where applicable?
- c. Is shoring/sloping provided where applicable?
- d. Is oxygen, etc., provided where necessary for life support?

- e. Are controls sufficient where interfaces occur with subcontractors who may actually perform the excavation/tunneling?
- f. For waste or disposal pits, are the controls adequate for the specific use of the pit?
- g. Are personnel trained and knowledgeable of the environment wherein they work?
- h. Are stairs/ladders provided for trenches more than 4 feet deep?

C. 25. Dynamic Pressure (Wind)

- a. Are special instances/situations affected by wind/pressure in compliance with company policy/procedures?
- b. Are there probable hazards from stored materials (boxes, loose wood/metal sheets, etc.) which can become projectiles in a strong wind?
- c. Are exterior doors provided with closures to prevent employees from being trapped between door jam and door?
- d. Are employees driving vehicles in this environment warned of hazards?
- e. For operations performed in dusty/windy environments, is the necessary protective equipment provided to prevent eye injuries and respiratory problems?
- f. Are special operations suspended when wind velocity reaches a specified limit (working at heights/over water/on electrical distribution systems, etc.)?

C. 26. Water

- a. Are operations over/in/under water in compliance with specified requirements?
- b. Is life-saving/support equipment provided as required and applicable?

C. 27. Other (Describe)

This section permits entry of any significant process which is not included in the above.

D. Energy Sources (Typical)

The concern here is with unwanted energy flow(s) which may hit a potential target and cause injury/illness/property damage. These factors include the equipment, apparatus, systems, etc., involved with the particular type(s) of energy.

This area does not concern itself with whether the energy properly performs a task based on some design criteria, unless the design creates unwanted energy flow.

D. 1. Acoustical

Are there situations where unwanted sound:

- a. Can startle, annoy, disrupt concentration?
- b. Can interfere with communication and consequently job performance and safety?
- c. Can (when exposure is severe) cause pain, nausea, etc.?

D. 2. Chemical/Corrosive

Are there any areas where chemicals may reasonably be expected to cause:

- a. Unwanted explosions?
- b. Unwanted fires?
- c. Unwanted burns?
- d. Unwanted actions or reactions?
- e. Unwanted exposures?

D. 3. Electrical

Is there any electrical device/service/equipment, etc., which may reasonably be expected to produce unwanted:

- a. Electrical shock/burn?
- b. Electrical explosion?

D. 4. Explosive/Pyrophoric

Is there any situation in the use, transportation, storage of explosive/pyrophoric material which may reasonably be expected to produce unwanted:

- a. Fire?
- b. Explosion?

D. 5. Electromagnetic/Particulates

Is there any device, service, system/equipment which may reasonably be expected to produce unwanted:

- a. Radiation?
- b. Particulates?

D. 6. Flammable

Are there any areas where flammable materials are used, transported, stored which may reasonably be expected to produce unwanted:

- a. Fire?
- b. Exposure?
- c. Property damage?

D. 7. Kinetic-Linear/Rotational

Are there any situations where bodies are in motion (linear/rotational) which may reasonably be expected to produce unwanted:

- a. Employee exposure?
- b. Property damage (machines, vehicles, materials, cranes, etc.)?

D. 8. Mass/Gravity/Height

Are there any situations involving mass of an object (resistance to change of motion), gravity (falling), or height (falling, distance) which may reasonably be expected to produce unwanted:

- a. Injuries?
- b. Property damage?

D. 9. Nuclear

Are there any activities involving nuclear material which may reasonably be expected to produce unwanted:

- a. Radiation exposure?
- b. Criticality?

D. 10. Radiant

Are there any activities involving radiant energy which may reasonably be expected to produce unwanted:

- a. Energy transfers?
- b. Property damage?
- c. Injuries

D. 11. Pressure Vacuum

Are there any activities involving pressure/vacuum which may reasonably be expected to produce unwanted:

- a. Energy transfer?
- b. Property damage?
- c. Injuries?
- d. Exposure?

D. 12. Toxic/Pathogenic

Are there any activities which might reasonably be expected to produce unwanted:

- a. Asphyxiation/drowning?
- b. Poisoning?
- c. Illness?

E. Management Hazard-Control Factors [the Management Systems/Programs which are established (policy) and implemented (procedures) to control/minimize hazards in order to provide a safe and healthful work environment]

E. 1. Arrangement/Space

- a. Are the work-area arrangements and space in compliance with all specified requirements?
- b. Are there congested areas which contribute to accidents and/or near accidents?
- c. Are there any complaints from work force on potential problem areas?
- d. Is the location/distance, etc., of the work area compatible with functional and structural needs? With nearby facilities?
- e. Are there hazard control measures provided where changes/modifications are taking place in arrangement/space?
- f. Do day-to-day changes modify original safe layout to one which may now be unsafe (poor housekeeping, stacking, storing, furniture moving, etc., without hazard review)?
- g. Is unused/surplus equipment/material disposed of in appropriate manner to reduce congestion?
- h. Does the design consider problems associated with space, proximity, crowding, convenience, order, freedom from interruption, enclosures, work flow, storage, etc.?

E. 2. Barriers/Guards

- a. Is the implementation of barriers/guards in compliance with requirements at all times for all areas?
- b. Each unwanted energy flow may require a different guard/barrier. Are they adequate for specific application (protective equipment, machine guards, hard material, paperware/administrative, etc.)?
- c. Does the work force understand the significance of barriers/guards? The potential exposure hazard if barrier/guard is removed?
- d. Are there instances where individual employees have willfully removed required guards simply because it gets in their way (not the same as those required for adjustment of new blades, etc.)?
- e. Are there instances where employees have, by omission or otherwise, negated administrative barriers (procedures, etc.)?

E. 3. Energy Control Techniques

- a. Is there a mandatory design requirement for control of hazardous energy (use of best techniques)?
- b. Is there a mandatory requirement for written Safe Operating Procedures in hazardous operations?
- c. Is the exposure to unwanted energy flow limited through numbers of, quantities of, distance/space, etc.?
- d. Is the energy form limited to the safest possible while allowing the function or task to be performed?
- e. Are provisions made to safely release or channel away unexpected/unwanted energy flow (rate, direction, time and space separation, etc.)?
- f. Are interfaces/interactions between various energies considered (and a hazard analysis performed) for counter-control measures?
- g. Are automatic/manual controls, interlocks, safety latches/catches, etc., provided where applicable?
- h. Are barriers/guards provided?
- i. Are caution/warning labels/signs posted?

E. 4. Color Coding

- a. If a color-coding scheme is used, is it consistent and in compliance with company requirements?
- b. Are there any areas/labels/signs which are faded or unreadable and need repainting/replacement?
- c. Are there unmarked areas which should be marked (color coded)?

E. 5. Control Devices

- a. Do control devices comply with all specified requirements?
- b. Are emergency shut-off controls provided? Tested and in working order?
- c. Are braking systems/steering systems provided, tested and in good working order?
- d. Are pressure controls/gauges/meters adequate for application? Are they tested/inspected? Is there a periodic replacement/calibration/cycle for specific applications?
- e. Are warning lights/control devices adequate? Tested? compatible with personnel limitations? Background noise interference free?
- f. Are adequate labels, signs posted in applicable places?
- g. Are personnel properly trained in use of devices?
- h. Are controls used which can be operated in short times with high reliability?

- i. Is the location of the control device compatible with safety requirements (prevention of unintended/accidental operation or personnel exposure)?
- j. Are functional controls (electrical/mechanical) adequate and in good working order?

E. 6. Certification/License/Permit

- a. Where applicable, do personnel possess required certificates/licenses/permits?
- b. In lieu of a formal licensing or certification program, have applicable personnel completed a recognized specialized training program (pressure, explosives, cranes/hoists, electrical, etc.)?
- c. Is all equipment which requires certification in compliance? Up-to-date (periodicity) of certification?
- d. Are safe work permits/continuous test permits obtained as specified? Current?

E. 7. Warning Signs, Labels, etc.

- a. Are adequate warning signs/labels, etc., provided and in compliance with all requirements in all applicable situations (goggle areas/high voltage/nuclear/laser/flammable/explosive/electrical/toxic/weight limits, etc.)?
- b. Are exit signs/lights provided? Clearly visible? Emergency power provided?
- c. Are emergency shut-offs adequately and appropriately marked?
- d. Are personnel trained/actually tested where feasible, so that in an emergency the employees will automatically find and use the emergency equipment?
- e. Are adequate lockout/tag-out (out of service/red-lined) signs/labels provided? Are they used?
- f. Are superfluous safety notices/signs removed?

E. 8. Protective Devices/Equipment/Systems

- a. Are applicable areas/processes, etc., provided with adequate protective devices/equipment/systems and do they comply with all specified requirements?
- b. Does the use/usage comply with all specified requirements?
- c. Are employees adequately trained in use of devices/equipment, etc.?
- d. Are there areas which should have equipment updated or replaced to more adequately comply with requirements (respirators/fire suppressant/control devices/ambulances/exhaust systems/clothing, etc.)?

- e. Is applicable equipment disinfected prior to issuance to another employee?

E. 9. Emergency Plan

- a. Is there a written emergency plan/instruction? Has the plan been tested?
- b. Do employees know what the plan is? Have they taken part in a test (feasible parts)?
- c. Is the plan scope broad enough to include other areas besides fire (sudden illness/heart attack/electrical shock/shutdown of runaway equipment, etc.)?
- d. Are phones and phone numbers provided? Do employees know exactly how to proceed in an emergency? Are other communication devices provided where use of phone is not possible?
- e. Does the plan provide for safe shutdown and safety of persons and objects during all anticipated emergencies?
- f. Are first aid/medical services readily available at work-site or near proximity?

E. 10. Safe Work Sequencing

- a. Is there a plan/procedure/practice for safe work sequencing?
- b. Is the preference for safety solutions prioritized (design/safety devices/warning devices/human factors review/procedures/personnel)?
- c. Has a job safety analysis been performed?
- d. When was the last time that the job(s) steps were observed to have been safely performed?
- e. Has there been a particular job/task which has contributed incidents/accidents/injuries due to lack of safe work sequencing or because proper sequencing was not followed?
- f. Are the sequences/proper steps documented?
- g. Are hazard reviews made when changes occur (personnel/supervision/processes/material/requirements, etc.)?

E. 11. Safe Work Practices

- a. Is there a standard method/procedure that is understood and consistently followed for safe operation?
- b. Do employees have the knowledge and skill to do their work safely?
- c. Do the workers understand the job and the work method?
- d. Are continuous observations made to assure that the task is done in safest way? That the workers comply with all procedures?
- e. Do employees operate machinery/tools/equipment/appliances without authority?

- f. Are employees working or operating at unsafe speeds?
- g. Have guards been removed or have guards/devices been rendered ineffective?
- h. Do employees repair/adjust equipment in motion, under pressure, electrically charged or containing dangerous substances?
- i. Do employees use defective tools or equipment?
- j. Are lockout/tagout practices/procedures followed?
- k. Are procedures/methods revised to agree with changes in material/equipment, etc.?
- l. Has a job safety analysis been performed (sequence the job, identify hazards and potential accidents, initiate ways to control or eliminate hazards, etc.)?
- m. Are the task, the man, and the hardware matched/compatible?
- n. Is there an emergency plan? Has it been tested?
- o. Are task assignments compatible with employee work restrictions/motion limitations?
- p. Are there checkpoints during an operation to assure steps are being done correctly?

E. 12. Safe Operating Procedures

- a. Are written Safe Operating Procedures in compliance with all specified requirements for hazardous operations/processes/environments, etc.?
- b. Is the procedure available to the action person? On site?
- c. Is the procedure current and up to date?
- d. Does the procedure receive independent review?
- e. Are review periods specified?
- f. Are special conditions set forth?
- g. Does SOP include names of authorized personnel?
- h. Are the action persons knowledgeable and familiar with the SOP?
- i. Are interface situations understood? A plan for control?
- j. Are emergency provisions included in the SOP?

E. 13. Inspection/Monitoring

- a. Is the inspection activity in compliance with all specified requirements?
- b. Is there documentation? A check list?
- c. Is there a systematic process or guide? Criteria?

- d. Is the scope broad enough to include all areas that should be inspected?
- e. Is there a schedule which is frequent enough to prevent or detect undesired changes?
- f. Is the time budgeted for inspection adequate?
- g. Is corrective action initiated on any defect after an inspection?
- h. Is the semiannual requirement for holding an area inspection complied with? Are the results reported to Safety as required?
- i. Is there a program for monitoring/measuring for toxic or harmful physical agents in excess of limit criteria in the work area?

E. 14. Maintenance

- a. Is there adequate maintenance of equipment/processes/utilities/operations, etc.?
- b. Are maintenance requirements specified by design or procurement documents? If not, are they provided for adequately by operations plans?
- c. Is there a maintenance schedule frequent enough to prevent or detect undesired changes?
- d. Is the schedule coordinated to minimize conflicts/interface problems, etc.?
- e. Are individual tasks organized where they can be performed properly and in the right sequence?
- f. Is the log of maintenance kept at the point-of-operation on the piece of equipment, etc.?
- g. Is the time provided for maintenance sufficient to adequately perform the task?
- h. Is the time budgeted adequate to fulfill the schedule?

E. 15. Safety Meetings

- a. Are meetings held in compliance with specified requirements?
- b. Are the meetings adequately planned?
- c. Are meetings held frequently enough to maintain interest?
- d. Are meetings held so frequently that the quality suffers?
- e. Is the practice of making an area inspection then holding a safety meeting on the results of the inspection followed?
- f. Are meetings reported to Safety at least semiannually?

E. 16. Safety Committees

- a. Does the organization make use of safety committees?

- b. Is the makeup of the committee spelled out or just hazardous?
- c. Is the committee membership rotated eventually among all organization personnel?
- d. Is there a charter for the committee (what to look at and what to look for)?
- e. Is the committee permitted to take positive action or merely make recommendations?
- f. If a committee is used, does it really serve a useful purpose?

E. 17. Safety Training

- a. Are training activities/programs in compliance with specified requirements?
- b. Is there a systematic/adequate training program for new hires, transferees, loanees, and for problem employees?
- c. Are employees required (where applicable) to attend specialized safety training courses (explosives, pressure, first aid, forklift, driver training, etc.)?
- d. Is the scope of the training adequate?
- e. Does supervisor receive adequate training?
- f. Has each employee been instructed in the recognition and avoidance of unsafe conditions and in the regulations applicable to his work environment?
- g. Has each employee been advised of his/her rights and responsibilities (record of exposures, access to personal safety and health record, filing complaints, compliance with specified criteria, etc.)?

E. 18. Incident/Accident Investigation

- a. Are all incidents/accidents promptly investigated and reported as required?
- b. Are employees aware and do they comply with reporting accidents/incidents promptly to supervision?
- c. Are current accident report forms immediately available in the organization?
- d. Is the investigation adequate to determine the causes of the accident (including contributory causes)?
- e. Is the report made to Safety through Medical adequate enough to show what employee was doing and how the accident occurred?
- f. Are analyses made of all organizational accidents in order to correct the system deficiencies which contributed to the accidents as well as specific fixes?

g. Are reported incidents/happenings investigated and analyzed for hazard prevention (leaks in equipment, etc.)?

E. 19. Other (describe)

This item is for use to describe any other significant factors which may not have been covered above.

APPENDIX A

Area Safety Inspection

Policy

First-line supervisors have the direct responsibility and will be held accountable for the safety of employees, facilities, and the operations they supervise.

Comprehensive safety inspections will be conducted on a routine basis. The inspections shall be documented and reported to the Safety Organization.

Procedure

Each supervisor shall take the initiative in establishing and maintaining safe and healthful practices and work environments.

Inspection of Work Areas

Daily observations of work areas/operating conditions.

Conduct periodic systematic inspections of entire work areas at least semiannually.

Record conditions noted on forms available from the Safety Organization.

SANDIA LABORATORIES SAFETY ADMINISTRATION

DATE:

FROM:

Subject: Area Safety Inspection Results for Division
Department

(See last page - backsheets.)

[illegible]

APPENDIX B

Safety Inspection Guide Work Sheet and Report

Policy

First-line supervisors have the direct responsibility and will be held accountable for the safety of employees, facilities, and the operations they supervise.

Comprehensive safety inspections will be conducted on a routine basis. The inspections shall be documented and reported to the Safety Organization.

Procedure

Each supervisor shall take the initiative in establishing and maintaining safe and healthful practices and work environments.

Inspection of Work Areas

Daily observations of work areas/operating conditions.

Conducting periodic systematic inspections of entire work areas at least semiannually.

Recording conditions noted on forms available from the Safety Organization.

SANDIA LABORATORIES SAFETY ADMINISTRATION

CONSIDER FOR INSPECTING/RECORDING

1. Areas under direct responsibility and control
 2. Areas not under direct control but where employees may be exposed (streets, test areas, etc.).
 3. Areas of interface with other organizations (shared facilities, projects, etc.).
 4. Employee safety concerns.
-

TO

SECTION III

<u>Look at Applicable:</u>		Detect Applicable Guide Question(s)	Analyze Assign Priority Symbol	Correct Action Status
<u>A. Physical Work Place:</u>				
1.	Building(s)			
2.	Heating			
3.	Cooling			
4.	Illumination			
5.	Sanitation			
6.	Ventilation/Exhaust			
7.	Water Supply			
8.	Egress/Exit			
9.	Pressure Vessel/Boiler			
10.	Piping			
11.	Walking/Working Surface			
12.	Elevators			
13.	Power Sources			
14.	Fire Protection Systems			
15.	Ground(s)			
16.	Sidewalk(s)			
17.	Street(s)			
18.	Parking Lots			
<u>B. Machines/Mechanical Equipment:</u>				
1.	Conveyor Systems			
2.	Engines			
3.	Guns			
4.	Hoist/Crane/Winch/Etc.			
5.	Machinery			
6.	Prime Movers			
7.	Power Transmission Systems			
8.	Powder Tools			
9.	Vehicles			
<u>C. Hazardous Material/Processes/Environment:</u>				
1.	Acids/Caustics			
2.	Combustible/Flammable			
3.	Cryogenic			
4.	Explosive/Pyrophoric			
5.	Oxidizing Agents			
6.	Reactive Chemicals			
7.	Surface Preparation/Finish			
8.	Toxic			
9.	Compressed Gas/Liquid			
10.	Pressure System			
11.	Contaminants/Particulates			
12.	Oxygen Deficient Atmosphere			
13.	Radiation/Radioactive			
14.	Electric/Electronic			
15.	Test/Testing			
16.	Weld/Cut/Braze			
17.	Material Handling			
18.	Storage Area			

Section III (cont)

<u>Look at Applicable:</u>		Detect	Analyze	Correct
		Applicable	Assign	Action
		Guide	Priority	Status
C. (cont)		Question(s)	Symbol	
19. Disposal/Waste Areas				
20. Fragmented Objects				
21. Tensioned Sources				
22. Sharp Objects				
23. Construction/Modification				
24. Pits/Excavations/Tunnels				
25. Dynamic Pressure (Wind)				
26. Water				
27. Other				
D. Energy Sources:				
1. Acoustical				
2. Chemical/Corrosive				
3. Electrical				
4. Explosive/Pyrophoric				
5. Electromagnetic, etc.				
6. Flammable				
7. Kinetic Linear/Rotational				
8. Mass/Gravity/Height				
9. Nuclear				
10. Radiant/Thermal/Nonthermal				
11. Pressure				
12. Toxic/Pathogenic				
E. Management Hazard Control Factors:				
1. Arrangement/Space				
2. Barriers/Guards				
3. Energy Control Techniques				
4. Color Coding				
5. Control Devices				
6. Certification/License/etc.				
7. Warning Signs/Labels				
8. Protective Devices, etc.				
9. Emergency Plan/Tests				
10. Safe Work Sequencing				
11. Safe Work Practices				
12. Safe Operating Procedures				
13. Inspection/Monitoring				
14. Maintenance				
15. Safety Meetings				
16. Safety Committees				
17. Safety Training				
18. Investigating/Reporting				
19. Other				

Definitions

Physical Work Place

Includes the plant and environment applicable to where employee(s) work.

Machines/Mechanical Equipment

Includes all types used/operated by employee(s) in performance of assigned tasks.

Hazardous Material, etc.

Includes all used by, performed by, or existing where employee(s) performs assigned task(s).

Energy Sources

Includes all energy, separate or in combination, used in performance of a task. (Concern here is unwanted energy flow.)

Management Hazard Control Factors

Includes programs to control (minimize) hazards and associated risks through design, energy management, safety programs, etc.

Symbols

Alpha "N" - Not applicable.

Check Mark () - No Defect/OK.

Corrective Action:

Priority 1 - Priority attention.

Priority 2 - Routine attention (If more than one guide question is applicable, assign highest corrective priority to line item required by frequency of exposure to the hazard, by potential severity and by potential impact (negative) on public.

Action Status:

"I" - Initiated
"C" - Completed
"D" - Delayed

Supervisor: _____

Ext : _____
Org : _____
Date : _____

APPENDIX C

Profile Chart

The Profile Chart is included as a visual aid and when used as a:

1. Positive Tree - deficiencies/omissions can be
 - a. systematically categorized (evaluated)
 - b. followed up for correction
 - c. referred to during next inspection
 - d. referenced should an unwanted incident occur
2. Negative Tree - incidents can be analyzed to show:
 - a. what was involved as things, processes, procedures (blue)
 - b. what defects, omissions, oversights were involved (red)
 - c. what changes are required of the management system as well as immediate specific corrections to prevent future incidents

Use of the Profile Chart enhances the collection of hard data by the user.

(See Profile Chart in pocket in the back cover.)

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APPENDIX D

Electrical

Battery Banks
Diesel Units
High Lines/Transformers
Wiring
Switchgear
Underground Wiring
Cable Runs
Service Outlets and Fittings
Pumps
Motors
Heaters
Power Tools/Small Equipment
Capacitors

Nuclear

Vaults
Temporary Storage Areas
Receiving/Shipping Areas
Casks
Burial Ground
Storage Racks
Canals and Basins
Reactor in Tank Storage Areas
Dollies/Trucks
Hand Carry
Cranes/Lifts
Commercial
Shops
Hot Cells
Assembly/Inspection Areas
Test Rigs
Reactors
Critical/Subcritical Facilities
Laboratories/Pilot Plants

Thermal Radiation

Furnaces/Boilers/Steam Lines
Lab and Pilot Plant Equipment
Solar

Mass/Gravity/Height

Human Effort
Stairs
Lifts/Cranes
Bucket and Ladder
Trucks
Slings/Hoists/Jacks
Elevators
Scaffolds and Ladders
Crane Cabs
Pits/Excavations
Elevated Doors
Canals
Vessels

Pressure

Boilers
Heated Surge Tanks
Autoclaves
Test Loops and Facilities
Gas Bottles
Pressure Vessels
Coiled Springs
Stressed Members
Gas Receivers

Kinetic-Linear

Cars/Buses/Trucks
Forklifts/Carts/Dollies
Railroads
Surfaces/Obstructions
Crane Loads in Motion
Shears/Presses

Kinetic-Rotational

Centrifuges
Motors/Gears
Pumps
Cooling Tower Fans
Cafeteria/Laundry Equipment
Shop Equipment (grinders, saws,
brushes, etc.)
Floor Polishers

Appendix D (cont)

Flammable Materials

Packing Materials
Rags
Gasoline (storage and in vehicles)
Lub/Coolant Oil
Paint Solvent
Diesel Fuel
Buildings/Trailers and Contents
Grease
Hydrogen (including battery packs)
Gases/Other
Spray Paint/Solvent Vats

Explosive/Pyrophoric

Blasting Caps
Primacord
Dynamite
Powder Metallurgy
Dusts
Hydrogen (including battery banks
and water decomposition)
Gases (other)
Nitrates
Electric Squibs
Peroxides-Superoxides

Toxic Pathogenic

Acetone
Fluorides
Carbon Monoxide
Lead
Ammonia and Compounds
Asbestos
Trichlorethylene
Dusts and Particulates
Pesticides/Herbicides/Insecticides
Bacteria
Beryllium and Compounds
Chlorine and Compounds
Decon Solutions
Sandblast
Metal Plating
Asphyxiation/Drowning

Corrosives

Acids/Caustics
"Natural" Chemicals (soil, water, air)
Decon Solutions

Thermal (Except Radiant)

Convection
Heavy Metal Weld Preheat
Exposed Steam Pipes
Electric Heaters
Fire Boxes/Furnaces
Lead-Melting Pots
Electrical Wiring/Equipment

Electromagnetic and Particulate
Radiation

Canals
Plug Storage
Storage Areas/Buildings
Radioactive Sources
Waste and Scrap
Contamination
Irradiated Experiments / Reactor
Equipment
Electric Furnace
Blacklight (e.g., magniflux)
Laser
Medical X-ray
Radiography Equipment/Sources
Welding
Electric Arc/Other (high current
circuits)
Electron Beam

Acoustical Radiation

Equipment Noise
Ultrasonic Cleaners

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SYMBOLS

BLACK – NOT APPLICABLE. (OR USE “N”)

GREEN – OK, SECURE, NO DEFECT, NO OVERSIGHT.

RED – DEFECT, UNSAFE, OVERSIGHT, ETC.

BLUE – LOCATION, INVOLVED IN ACCIDENTS

①

PRIORITY ATTENTION

②

ROUTINE ATTENTION

STATUS

ACTION INITIATED – “I”

ACTION COMPLETED – “C”

ACTION DELAYED – “D”

PROFILE CHART

APPENDIX – “C”
FOR USE WITH THE SAFETY INSPECTION GUIDE/REPORT

A

PHYSICAL
WORK
PLACE

LOOK AT

RECORD HAZARD(S)
DEFECT(S)

PRIORITY
SYMBOL

STATUS

1. BLDGS.
ETC.

2. HEATING

3. COOLING

4. LIGHTING

5. SANI-
TATION

6. VENT/
EXHAUST

7. WATER

8. EGRESS
EXIT

9. P/V
BOILER

10. PIPING

11. WALK
WORK
SURFACE

12. ELEV-
ATORS

13. POWER
SOURCES

14. FIRE
PROT.
SYS.

15. GROUNDS

16. SIDE
WALKS

17. STREETS

18. PARK
LOTS

OTHER
?

B

MACHINES
MECHANICAL
EQUIPMENT

LOOK AT

RECORD HAZARD(S)
DEFECT(S)

PRIORITY
SYMBOL

STATUS

1. CONVEYER
SYS.

2. ENGINES

3. GUNS/
FIREARMS

4. HOIST
CRANE
ETC.

5. MACH-
INERY

6. PRIME
MOVERS

7. POWER
TRANS.
SYS.

8. POWDER
TOOLS

9. VEHICLES

OTHER
?

C

HAZARDOUS
MATERIAL
PROCESSES
ENVIRONMENTS

LOOK AT

RECORD HAZARD(S)
DEFECT(S)

PRIORITY
SYMBOL

STATUS

1. ACIDS
CAUSTICS

2. COMBUSTIBLE
FLAMMABLE

3. CRYO-
GENIC

4. EXPLOSIVE
PYRO-
PHORIC

5. OXIDIZING
AGENTS

6. REACTIVE
CHEMICALS

7. SURFACE
PREP.
FINISH

8. TOXIC

9. COMPRESSED
GAS/LIQUID

10. PRESSURE
SYSTEM

11. CONTAMINANTS
PARTICULATES

12. OXYGEN
DEFICIENT
ATMOSPHERE

13. RADIOACTIVE

14. ELEC/
ELEX

15. TEST/
TESTING

16. WELD
CUT
BRAZE

17. MATERIAL
HANDLING

18. STORAGE
AREAS

19. DISPOSAL
WASTE
AREAS

D

ENERGY
SOURCES

LOOK AT

RECORD HAZARD(S)
DEFECT(S)

PRIORITY
SYMBOL

STATUS

1. ACOUST-
ICAL

2. CHEMICAL
CORROSIVE

3. ELECT.

4. EXPLOSIVE
PYROPHORIC

5. ELECTRO
MAGNETIC
PARTICULATE RAD.

6. FLAM-
MABLE

7. KINETIC
LIN/ROT

8. MASS
GRAVITY
HEIGHT

9. NUCLEAR

10. RADIANT

11. PRESSURE

12. TOXIC
PATHO-
GENIC

20. FRAGMENTED
OBJECTS

21. TENSIONED
SOURCES

22. SHARP
OBJECTS

23. CONSTRUCT.
MODIFY

24. PITS
EXCAVATIONS
TUNNELS

25. DYNAMIC
PRESSURE
(WIND)

26. WATER

E

MANAGEMENT
HAZARD
CONTROL
FACTORS

LOOK AT

RECORD INADEQUACIES
OMISSIONS,
ETC.

PRIORITY
SYMBOL

STATUS

1. ARRANGE-
MENT
SPACE

2. BARRIERS
GUARDS

3. ENERGY
CONTROLS

4. COLOR
CODING

5. CONTROL
DEVICES

6. CERT.
LICENSE
PERMIT

7. WARN
SIGNS
LABELS

8. PROTECT
DEVICES
EQPT. SYS.

9. EMERG-
ENCY
PLAN TEST

10. SAFE
WORK
SEQUENCE

11. SAFE
WORK
PRACT.

12. SAFE
OPER.
PROCED.

13. INSP.
MONITOR

14. MTCE.

15. SAFETY
MTGS.

16. SAFETY
COMM.

17. SAFETY
TRNG.

18. INVEST.
REPORT

19. OTHER
?

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