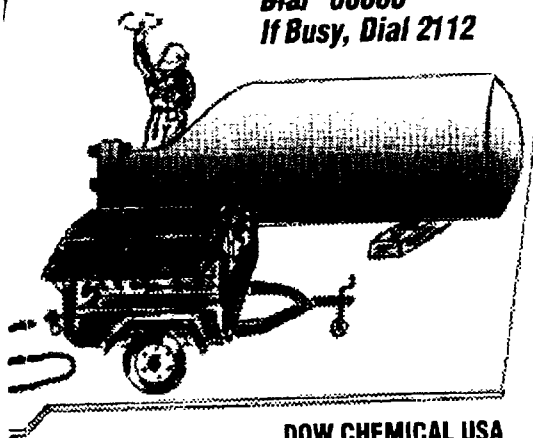


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**Safety And
Loss
Prevention
Manual
For
Contractors**

**To Report an Emergency:
Dial "66666"
If Busy, Dial 2112**



**DOW CHEMICAL USA
TEXAS OPERATIONS
FREEPORT, TEXAS
APRIL, 1989**

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SAFETY & LOSS PREVENTION OBJECTIVE

of

THE DOW CHEMICAL COMPANY

Superior Safety & Loss Prevention performance is an objective of all operations of The Dow Chemical Company. If Dow is to obtain optimum protection of its people, property and profits, then a good Contractor Safety & Loss Prevention Program which complements the Company's program is necessary.

Our objective is to guide Contractors to establish and maintain an accident prevention program to:

Eliminate accidents to Contractor personnel and property, and,

Eliminate Contractor accidents which affect Dow personnel and property, and result in business interruptions.



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**SAFETY & LOSS PREVENTION MANUAL
FOR CONTRACTORS**

REVISED APRIL 1989

**FOR USE BY ALL CONTRACTOR
PERSONNEL**

**DOW CHEMICAL U.S.A.
TEXAS OPERATIONS**

**SUPERSEDES SAFETY AND LOSS PREVENTION
MANUAL FOR CONTRACTORS
DATED OCTOBER, 1981**

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*Cover Design By
N. F. (Norm) Schultz
E&CS Division*

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INTRODUCTION

This Safety Manual contains the minimum safety rules and procedures for performance of work by Contractors and their subcontractors as required by Texas Operations, Dow Chemical U.S.A., hereinafter referred to as Owner.

The Owner will be defined in the contract and hereinafter referred to as "Owner's Representative."

Contractor assumes and has the full responsibility and liability for the safety of its agents, servants and employees and for the compliance of its subcontractors, and anything contained herein does not relieve the Contractor of such responsibility or liability.

Safety rules and procedures are an integral part of each contract and must be carried out fully, as any other specification for the job. Any exception to the rules set forth herein must have prior written authorization from the Owner's Representative.

Contractors unable or unwilling to secure personnel performance in keeping with these rules will not be acceptable. The Contractor's safety record and Workers Compensation EMR will be two criteria used to judge qualifications for bidding.

In addition to the rules set forth herein, Contractors working in or near an existing operating facility must be cognizant of and conform to Owner's safety rules for that area and any applicable federal, state or local laws.

Should any procedure set forth herein conflict with applicable federal, state or local laws, the more stringent will apply.

ST0401821

TEXAS OPERATIONS EMERGENCY PROCEDURE

1. The following procedure must be used to call an ambulance, report a fire, spill of hazardous materials or release of hazardous gases:

- a. Dial "66666" (if busy or does not answer immediately dial 2112).
- b. Give your name, the nature of the emergency and its exact location, including building number and door letter, if applicable.
- c. Stay on the line until you are sure that the message is understood and confirmed.
- d. Station someone on the road to direct emergency equipment to the scene.
- e. The emergency phone numbers are not to be used for anything other than for emergency calls.

2. Personnel must know the location of any plant alarm horns. In case of a gas release, observe the wind direction as indicated by the alarm horn and wind vane indicator and proceed to go crosswind. STANDARD EMERGENCY SIGNALS ARE AS FOLLOWS:

- a. GAS RELEASE _____
(Continuous)

This signal must be sounded only by the department where a hazardous release occurs. Shut down all of your equipment in operation. Stop smoking. All Safe Work Permits in that area are automatically cancelled. All except those charged with the respon-

sibility of taking care of the emergency must leave the immediate area of the release and go to the proper assembly point according to the Unit Emergency Plan until the "All Clear" is sounded. Personnel in other areas downwind must be alert for signals in their area or verbal instructions.

b. ALERT -----
(Series of short blasts)

Shut down all of your equipment in operation. Stop smoking. All Safe Work Permits in that area are automatically cancelled. Personnel in other areas downwind must be alert for signals in their area or verbal instructions.

c. EVACUATE-----
(Series of 3 short blasts)

Stop smoking. All Safe Work Permits are automatically cancelled. Evacuate according to the unit emergency plan of the plant in which you are working or, lacking such a plan, observe the wind direction as indicated by alarm horn and wind vane indicator and proceed crosswind or, if that direction is not possible, upwind.

d. ALL CLEAR -----
(Series of 3 long blasts)

When this signal is given, personnel may re-enter the work area. Safe Work Permits must be reissued prior to starting work.

3. If Operating a motor vehicle in an area where a gas release signal is given, avoid driving in gas clouds. Evacuate cross wind from the affected area. Do not drive into an area downwind of a gas release. Follow all instructions given by Industrial

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Security. Barricades across or partially across plant roads must be obeyed by all vehicles at all times.

4. In the event a work area is evacuated for any emergency reason, contractor personnel will evacuate according to the Unit Emergency Plan of the block in which they are working. Each contractor employee is required to notify his company supervision of his whereabouts. Contractor supervision will make a head count and report to the Owner's Representative of the job or block. Do not wait for the "All Clear" before accounting for your employees.

If not working under a Unit Emergency Plan (such as contractor field offices and shops), contractors will develop and communicate their own Unit Emergency Plan.

5. Emergency horns are tested each Monday at 12:00 noon with the "All Clear" Signal given first and last in the test cycles.

GENERAL SAFETY RULES

A. RESPONSIBILITY FOR SAFETY

1. The Contractor shall actively and adequately promote safe working performance on the part of its employees. The Contractor shall participate in activities to this end, such as contractor safety organizations (e.g., Contractors' Safety Council of Brazosport, Inc.), contractor owner programs, etc. It is expected that each Contractor will conduct its own safety programs to best suit its particular needs.

2. Contractors must report immediately in writing to the Owner's Representative, by name, those

employees DISCHARGED for safety rule infractions. The reason for the discharge must be given. Such employees will not be allowed to return to any Owner's work without proper authorization from the Owner.

3. Prior to starting any field work on each job, the Owner's Representative will conduct a pre-job safety conference with an authorized representative of the Contractor, a Manufacturing Representative, available subcontractor's representatives and Owner's safety representative, when available. At this time, the nature of any chemical hazards or special safety rules for the area will be reviewed with the Process Representative and the Contractor will be provided with printed copies of the area rules where applicable. The "Pre-Job Safety Check Sheet" form (Refer to Section W, Page 89) will be prepared by the Owner's Representative and a copy furnished to the Contractor.

4. Before working on Dow property EVERY contractor employee must be indoctrinated as to the rules in this manual through an approved safety indoctrination program. Contractors shall inform all their employees of all safety rules and procedures before working in an Owner's plant. The Contractors' Safety Council of Brazosport, Inc. has devised an effective means of orientation for contractor employees to help meet these requirements. It is required that all Contractors utilize this program, or an approved equal, for new contractor employees who are starting work on Dow property.

In addition to the basic contractor safety indoctrination, contractor employees shall receive block or unit safety orientations covering the hazards for that area prior to starting work.

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ST0401826

5. Contractors shall inform all of their employees of the location and use of nearest safety shower, eye bath and emergency equipment such as fire extinguishers.

6. Contractors shall use a regular system of work inspection to detect and correct hazardous conditions, safety rule violations and unsafe working practices. These safety inspections shall be reported to the Owner's Representative in writing each week.

7. Contractors shall maintain a clean and orderly job site at all times. Special attention must be given to maintaining clear walkways and roadways, removal of trash, removal of slipping and tripping hazards and proper stacking of materials. Contractors must make every effort to keep mud, slush or other slippery substances off plant roads. In cases where this cannot be avoided, contractors must clean the roadways immediately.

8. Contractors shall maintain continuous safety planning to cover jobs where circumstances have changed and new hazards require new controls.

9. An interpreter shall be on the work site and readily available at all times for all non-English speaking employees.

10. Contractor personnel shall not work over 16 hours continuously without prior approval of Owner's Representative.

B. INJURIES - SERIOUS INCIDENTS

1. It is the Contractor's responsibility to make sure that all injured personnel receive prompt medical attention at a recognized medical facility.

2. If foreign material gets in the eye, the eye must be washed immediately with potable running water, preferably at an eyewash station, and the washing continued uninterrupted for at least fifteen minutes. THE AMBULANCE MUST BE CALLED.

3. If chemicals come in contact with the body, the affected parts must be washed with running water for at least fifteen minutes. To make sure that adequate washing is accomplished, shoes and clothing covering affected parts must be removed. The Owner's Representative must be consulted before reuse of clothing and shoes that may have been contaminated.

4. In addition to the requirement for eye irrigation procedure, the ambulance must be called for:

- a. Foreign material in eye.
- b. An employee suffering from chest pain.
- c. Extensive exposure to toxic or corrosive material.
- d. Any employee in obvious/serious distress.

5. The Owner's Representative shall be notified immediately in the event of any injury, serious incident or hazardous condition.

6. All fires shall be reported, regardless of duration or extent.

7. It is the Contractor's responsibility to investigate all injuries and incidents and submit a final report to the Owner's Representative.

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8. Written notification must be submitted on every injury or serious incident to the Owner's Representative no later than 10:00 a.m. of the next working day. Forms for these reports, "Contractor Accident and Incident Reports", (Refer to Section Page 89) are available through the Contractor Safety Council of Brazosport, Inc..

C. INDIVIDUAL ACTION

1. Employees must report injury to their immediate supervisor even though it may be considered slight
2. Horseplay in any form is not allowed.
3. Unsafe shortcuts such as walking on pipelines, cable trays, sliding down pipe stanchions, crossing ditches or "cutting corners" to save a few steps must be avoided.
4. Do not make inoperative or operate safety devices such as relief valves, deluge valves, electrical and mechanical interlocks in an operating plant without written approval.
5. Do not drop or throw tools, materials or equipment from one level to another unless precautions have been taken against possible injury to personnel or damage to equipment.
6. Contractor personnel shall not use or borrow equipment, materials, vehicles or tools of another company without that Company's prior approval.
7. Compressed air shall not be used to clean clothing or skin. If air is used for cleaning work areas,

etc., the pressure shall be controlled at 30 psi or less.

8. Flammable materials or chemical pollutants including gasoline, oil or hydraulic fluid, shall not be vented or dumped anywhere. If accidental venting or dumping occurs, call Industrial Security at 2112.

9. Employees must know where the nearest safety shower and eye bath facilities are located.

10. Personnel shall not wear rings while in plant areas and laboratories. Rings may be worn in offices, lunch rooms, cafeterias or going to and from work in designated walkways.

11. Do not wear loose clothing, jewelry, or unconstrained long hair around machinery.

12. Smoking is not permitted inside the gate except in designated areas. Designated areas will not include plant roadways, utility corridors or ditches.

13. Alcohol, firearms, or unauthorized drugs are not permitted on Dow property.

D. PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT

1. Protective clothing and equipment need not be worn while an employee is in an office, control room, lunch room, change room, going to and from parking lots and buildings by designated routes, or walking main roadways, unless it is required for the work being done. Eye protection or hard hats are not required inside motor vehicles. Each employee is

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responsible for using and wearing protective clothing and equipment in the correct manner.

2. Protective clothing and equipment shall not be misused or altered in such a way that its original protective features are rendered less effective.

3. Contractors shall ensure that their employees are equipped with personal protective equipment manufactured in accordance with the appropriate American National Standards Institute (ANSI), or the National Institute for Occupational Safety and Health (NIOSH) standard.

4. Safety glasses with permanently affixed or clip on side-shields are a minimum requirement on all contractor jobs.

5. Safety glasses or chemical goggles with dark tinted lenses are not to be worn at night or in dark locations during the day.

6. Chemical goggles are required for working in or entering posted chemical areas. When chemical type goggles are in use, the headband must be around the back of the head, not around the safety hat.

7. A face shield shall be worn over either sideshield glasses or chemical goggles when chipping, using grinders, buffers, friction cut-off saws, impact chisels or if the job involves flying debris.

8. Plastic safety hats are required for all contractor work.

9. Plastic safety hats and sideshield safety glasses must be worn while wearing a welding hood. Requirement for wearing the safety hat may be waived by the Owner's Representative in specific instances where the wearing of the safety hat creates a greater hazard than without.

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10. Appropriate welding goggles shall be used for all gas welding or cutting and welding hoods shall be used for all electric welding and cutting.

11. In plants where it is required, an escape respirator approved for the specific work area hazard must be kept with employees and ready for use at all times. Personnel required to use respirators must be trained in their use.

12. Employees required by their job assignments, both routine and emergency response, to wear nose-mouth respirators, full-face gas mask, fresh-air mask, SCBAs or other such protective equipment shall be clean shaven in the areas between the mask seal surface and facial skin and shall be medically certified to wear such equipment.

13. Air hoods and breathing air compressor requirements.

a. Air hoods or equivalent equipment, supplied with filtered air, shall be worn when sandblasting or applying volatile or toxic material inside tanks, rooms or other inadequately ventilated areas. The enclosed area must be sufficiently ventilated to prevent the buildup of an explosive mixture.

b. Breathing air compressors shall be constructed and situated so as to avoid entry of contaminated air into the system and suitable in-line

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air purifying sorbent beds and filters shall be stalled to further assure breathing air quality. receiver tank of sufficient capacity to enable respirator wearer to escape from a contaminated atmosphere in event of overheating shall be stalled in the system. If an oil-lubricated compressor is used, it shall have a high temperature or carbon monoxide alarm, (or shutdown) both. If only a high temperature alarm (or shutdown) is used, the air from the compressor shall be tested daily for carbon monoxide to insure that it meets the specifications of CGA TYPE GRADE D air. These alarms or shutdowns shall be checked or replaced yearly.

14. Each employee is expected to wear person clothing that is safe and proper for the job. Employees other than office employees shall wear minimum of a shirt with sleeves and long trousers while on the job.

15. Safety shoes are recommended and may be purchased at the Safety Center. Canvas, cloth or open toed shoes shall not be worn in any non-office environment. No bare feet or thongs are allowed in Texas Operations.

16. When using an air operated jack hammer for breaking concrete, the user will wear a face shield and metatarsal guards for foot protection. Personnel in close proximity shall also wear a face shield.

17. Coast Guard approved life jackets or safety harnesses shall be worn when working over or near a water hazard.

18. Hearing protectors approved for the specific noise level shall be worn whenever employees are

exposed to sound levels of 90dB or greater. Contractors shall provide training in use and care of all hearing protectors provided employees.

E. VEHICLES AND TRAFFIC

1. Drivers of all vehicles and bicycles must obey all traffic signs and rules in the plant. Texas traffic rules prevail.

2. Motor vehicle accidents, including those involving personal cars on Dow property, shall be reported to Industrial Security and the Owner's Representative immediately. (Phone 2112)

3. When approaching a plant bus which has yellow warning lights flashing, slow down and be prepared to stop. When the red flashing light comes on, vehicles must come to a complete stop.

Do not pass until:

- a. the bus has resumed motion,
- b. you are signalled by the driver to proceed, or
- c. the lights are no longer flashing.

4. Every driver shall possess a valid driver's license.

5. Every vehicle shall bear a current State inspection sticker and be maintained in a safe working condition at all times.

6. A motorcycle is to be ridden by only one person who shall wear a protective helmet.

7. The maximum speed limit on plant roads is 30 miles per hour unless otherwise designated.

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8. A motor vehicle engine shall not be left running the vehicle is unattended unless permission is obtained from the Owner's Representative. Lift truck engines shall be turned off when unattended. Unattended means that the driver has left the normal control position of the vehicle.

9. Do not refuel gasoline engine driven equipment while the engine is running, or near any predictable source of ignition, such as welding operations.

10. Fuel tanks on equipment powered by diesel engines shall not be filled with the engine running if in the process it is possible to spill fuel on a hot engine or manifold.

11. Always wear chemical goggles when jump starting or handling batteries. (Includes "maintenance free" type)

12. Seat belts shall be worn by all occupants in passenger vehicles and by all occupants in the cabs of pickups and trucks. Occupants of the bed of pickups and trucks shall be seated within the bed or on built-in seats. Do not lean against the tailgate.

13. Personnel may ride as passengers on equipment such as mobile cranes, winch trucks or flatbeds, only if adequate provision has been made for seats or hand holds.

14. All trailer hitches and other towing equipment shall be utilized according to the manufacturer's recommendations and not altered in any way.

15. If a vehicle or its load is more than 10 feet in width or higher than 16 feet, Industrial Security shall

provide an escort when in transit on main Dow roads (roads within block limits not included).

16. Hauled material on main plant roads that overhang the sides of trucks, trailers, or cranes more than one foot shall be flagged. Material extending more than three feet from the front or four feet beyond the rear shall be flagged. Loads shall not be hauled from a single suspension cable that allows free swinging.

17. Dragging or skidding material and objects along plant roadways is prohibited.

18. Prior to ordering vacuum trucks, Contractor shall coordinate with the Owner's Representative and Environmental Operations.

19. Prior to moving extremely heavy loads, Contractor shall determine from the Owner's Representative which roads and bridges are to be used and when.

a. All bridge load limit signs shall be adhered to. All cranes above the 150 ton capacity shall have special clearance from the Maintenance Functional Rigging Department prior to their movement outside of block perimeters.

b. Bridge load limit signs have been color coded for routing crane traffic according to the following:

Red	Maximum of a 15 ton crane
Yellow	Maximum of a 50 ton crane
Brown	Maximum of a light-weight 80 ton crane
Green	All cranes up to and including the 150 ton capacity

c. The weight of all cranes above the 150 ton classification shall be calculated prior to crossing any bridge.

d. All 300 ton cranes shall be stripped down prior to crossing any bridge.

20. When moving fixed boom cranes on Dow roads a flagman shall be provided to clear traffic at intersections.

21. When moving retractable boom cranes on Dow roads, the boom shall be fully retracted.

22. The following rules pertain to all cranes, cherry pickers, and other load carrying vehicles.

a. The tip of all booms and jibs shall be marked with high visibility material.

b. When moving a load in a congested area or where load swinging would present a hazard to personnel or property, a flagman shall be provided and swinging of loads shall be controlled by a tag line.

F. PORTABLE BUILDINGS

1. Portable buildings and storage areas shall be set up as neatly as possible to present an orderly appearance and maintained in good repair.

2. Sheeting for portable buildings shall be of non-combustible materials, such as tin or aluminum for siding and roofs, and each building must be identified with the contractor's name and building number.

3. During the months June through October (Hurricane Season), Contractors shall immediately tie down or remove all their portable buildings and portable toilets from Dow property.

4. Portable Building tie-down requirements:

a. Buildings which have rafter and wall studs secured by hurricane anchor plates may be tied down at the floor stringers or over the roof.

b. Galvanized metal straps installed by the building or trailer manufacturer are acceptable if they meet the following:

i. Straps must be galvanized 1 1/4" x .031" or better, with a tensile strength of 4900 lbs.

ii. Straps must run completely around the structure but underneath the siding and roofing.

iii. Special anchors must be used which provide a flat surface to wrap the strap around. Anchors must be as near vertical to the strap as possible.

iv. Straps must be installed straight with no twisting and anchors must be in line with straps.

v. Straps must be positioned not over 12' apart, plus additional straps for each 12' of length or fraction thereof. All buildings must have at least four straps located within 2 feet of the corners.

c. All other buildings must be tied down by 3/8" minimum galvanized cable or salvage rigging cable over the roof.

d. Two cable clamps are required on each cable tie-down.

e. Anchors must be 4" A.B. Chance no-wrench screw anchors, catalog number 4345-1 or equal. Anchors must be placed in the ground a minimum of four feet. Proper clearance by Owner's Representative is required before ground penetration is made.

When set up on concrete slabs, 5/8" anchors with eye bolts may be used in lieu of screw anchors.

f. A minimum of four anchors for the first 12 feet of building length located within 2 feet of the corners and two anchors for each additional 12' of length will be used. Portable toilets will require a minimum of two anchors, and may be tied down over the roof or through the base.

g. Contractors must periodically check tie-downs for corrosion, damage, tightness of cable, etc., to ensure a firm tie-down and replace if necessary.

5. A contractor furnished fire extinguisher rated not less than five (5) pounds, shall be within 100 feet for each 3,000 square feet of building area or major fraction thereof.

6. Metal buildings served with electricity shall have the service entrance switch and the skin of the building grounded in such a manner that neither is dependent upon the other. Electrical bonding jumper

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wires at corners and roof are required ONLY if building construction does not provide for complete grounding continuity.

a. Service drop of at least # 8 wire, 2 colors, 1 white, is required.

b. An outside electrical service disconnect is to be securely attached to each building and an electrical circuit ground wire, #6 minimum, is to be securely clamped to ground rod for continuity.

c. A building skin ground, #6 minimum is required. Check for electrolytic corrosion if dissimilar materials are bonded.

d. Ground rods shall be 3/4" galvanized steel, and shall be driven to a depth of 9 1/2 feet. Proper clearance and safe work permit from Owner's Representative is required before ground penetration is made.

7. Electrical outlets and grounds are to be tested in accordance with OSHA 1926.401.

G. FIRE PROTECTION

1. There must be a fire extinguisher, water hose, or other fire control equipment easily accessible for each welding, cutting, burning or other such operation.

a. A fire extinguisher for welding and cutting operations can be obtained through the Owner's Representative.

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b. It is also the Contractor's responsibility to arrange, through the Owner's Representative, for the recharging and resealing of owner furnished extinguishers immediately after each use.

2. Special care must be taken during overhead cutting and welding operations to safeguard personnel and prevent falling sparks from starting a fire. Warning signs must be posted at each level below the area of any overhead welding, burning or cutting operation.

3. When welding or cutting torches are left unattended, shut off the oxygen and fuel supply at the cylinders and bleed pressure off the hoses.

4. All welding and cutting torches must be equipped with reverse flow check valves.

5. All tarpaulins used in welding, cutting or heating operations shall be fire-retardant. In lieu of this, fireproof blankets made of fiberglass are acceptable.

6. All containers 5 gallons or less used for transporting or transferring gasoline or fuel must be labeled by Underwriters' Laboratories or Factory Mutual Laboratories.

a. Fuel storage tanks, filler hoses and the dispensing vehicle or container must be properly grounded, bonded and equipped with Contractor furnished fire extinguisher. Storage tanks must be identified with the Contractor's name.

b. Except for hand pumps, a quick closing shut-off valve is required on the dispensing end of fuel hoses.

c. While dispensing fuel, the fuel hose must be attended at all times.

d. Smoking, welding or any spark or flame producing operation in the immediate area must be stopped during refueling operations.

e. The Contractor shall post and maintain "NO SMOKING" signs in fuel storage areas.

7. It is the Contractor's responsibility to obtain approval through the Owner's Representative on the proper location of all fuel storage tanks. In all cases the tanks shall be located or the area diked or sloped so that a spill shall not create a hazard to operating plants or contaminate ditches or navigable water.

8. Gas and oxygen cylinders must be handled with care, properly supported in an upright position away from any sources of heat or flame, and securely tied off. All cylinders not in use must have their caps in place.

a. Oxygen cylinders in storage shall be separated from fuel gas cylinders or combustible materials (such as oil or grease) a minimum distance of 20 feet, or by a non-combustible barrier at least 5 feet high having a fire resistance rating of at least one-half hour.

b. When a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of an emergency.

c. When gas and oxygen cylinders are lifted by hoisting equipment, a basket, cradle or similar

handling device must be used. Cylinders must not be lifted by the valve protection caps.

d. When gas or oxygen cylinders are transported over plant roads, they must be carried in an upright position with valve protection caps in place. The cylinders must be securely tied down.

H. MACHINERY, CRANES, PERSONNEL PLATFORMS, TOOLS AND EQUIPMENT

1. Defective tools and equipment shall be removed from service and repaired or disposed of immediately.

2. Equipment with gears, belts, couplings, fans, etc., shall not be operated without effective guards.

3. Operator Qualifications:

a. Mobile-hoisting operators, prior to performing any operation on Dow-controlled property, shall be certified by their employer as qualified to operate the particular piece of equipment they are assigned to operate. A written record of operator certification shall include, but not be limited to, the following:

i. Successful completion of a written test on the operation of the equipment, including load charts and hand signals.

ii. Successful demonstration to safely and properly operate the size and type of equipment assigned to operate.

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On successful completion, each operator shall be issued a certificate by their employer stating date of qualification and equipment size they are qualified to operate, e.g., up to 50 ton hydraulic crane. The employer shall instruct employees to keep the certificate in their possession while on duty.

Testing procedures and the tests used shall be approved and audited by the Rigging/Hoisting Coordinator or his designee who is available by calling the E&CS office located at OC1120, phone 238-9831.

b. Personnel lifting device (bucket trucks, aerial lifts, etc.) operators shall be trained and certified by their employers, or other recognized trainers, as qualified to operate the assigned personnel lifting equipment. On successful completion, and testing, each operator shall be issued a certificate by their employer, stating date of qualification and personnel lifting equipment they are qualified to operate.

Testing procedures and the tests used shall be approved and audited by the Rigging/Hoisting Coordinator or his designee available by calling the E&CS office located at OC1120, phone 238-9831.

c. Lift truck (fork lift) operators shall be trained and certified by their employers, or other recognized trainers, as qualified to operate the assigned equipment. On successful completion, and testing each operator shall be issued a certificate by their employer, stating date of qualification and material handling equipment the operators are qualified to operate.

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The testing procedure and tests used shall be approved and audited by the Rigging/Hoisting Coordinator or his designee who is available by calling the E&CS office located at OC1120 phone 238-9831.

4. Exceptions to operator qualifications:

a. Certain apprentices and trainees may be certified by their employers as "trainees" provided the operation is under the direction of a qualified operator, and the operation is in a non-production plant area, suitable for training.

b. In certain limited instances, employers may certify an operator based on previous work history. Consideration shall be given to years experience on the type of equipment to be operated.

c. Exceptions to operator qualifications shall be audited by the Rigging/Hoisting Coordinator or his designee who is available at E&CS office OC1120.

5. Equipment qualifications:

a. Mobile-hoisting, personnel aerial lifting, and lift truck type equipment shall be inspected by the equipment owner on a regular frequency of four months. Inspection shall be documented in writing using the proper inspection report (Refer to Section W, Page 89) or equivalent available at E&CS office, B10602. Each inspection report shall be audited by the Dow Rigging/Hoisting Coordinator or his designee. If approved, he will affix a numbered and dated decal (Refer to Section W, Page 89) on the cab or body of the hoist

ing or material moving equipment. Decals will expire on the last day of the month designated by a large number on the face of the decal.

b. Each operator shall complete a daily inspection for mobile hoisting, personnel aerial lifting and for lift truck operations prior to use (Refer to Section W, Page 89). Any deficiencies that affect safe operation shall be repaired. Defective parts will be replaced before use. The inspection report shall remain with the inspected equipment. Inspection forms are available at the E&CS office, OC1120 or B-10602.

6. Exceptions to equipment qualifications:

a. No mobile hoisting, personnel aerial lifting or lift truck type equipment without the proper decal affixed is to be operated on Dow-controlled property, except: The equipment owner may prepare the proper equipment inspection report, ascertain the equipment is in satisfactory condition, and accept responsibility for safe use of the equipment for a maximum period of three days provided that a critical lift is not involved and the audit procedure is initiated immediately. See critical lift conditions outlined in H.8.

7. A Crane Safe Work Permit (Refer to Section W, Page 89) will be issued by the Owner for cranes having a capacity greater than ten tons or for all cranes if the lift is a critical lift.

8. When any of the following "Critical Lift" conditions prevail, the contractor must, using the Owner's "Crane Safe Work Permit", submit a written outline of the safety planning for the lift. This must be given

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to the Owner's Representative prior to starting lift.

- a. The load exceeds 80% of the rated load of the crane,
- b. Failure would cause major release of a hazardous material,
- c. Two cranes are required to make the lift;
- d. Poles or derricks have been erected for a specific lift.

9. The contractor has the complete responsibility for a safe lifting operation when using hoisting equipment to make lifts.

- a. A flagman shall be provided whenever equipment in operation partially blocks a plant road whenever the operation of the equipment could present a hazard to personnel or property.
- b. Personnel shall not position themselves under or between any load or object that could create a pinch point.
- c. Crane shall be level, all outriggers must be fully extended whenever possible and full contact with a good footing assured prior to lifting a load.

10. The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform.

form or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.

a. Cranes used for hoisting personnel must have a current inspection decal.

b. Load lines shall be capable of supporting, without failure, at least seven times the maximum intended load, except when rotation resistant rope is used, the lines shall be capable of supporting without failure, at least ten times the maximum intended load.

c. Load and boom hoist drum brakes, swing brakes, and locking devices such as pawls, or dogs shall be engaged when the occupied personnel platform is in a stationary working position.

d. The load line hoist drum shall have a system or device on the power train, other than the load hoist brake, which regulates the lowering rate or speed of the hoist mechanism (controlled load lowering). Free fall is prohibited.

e. The crane shall be uniformly level within one percent of level grade and located on firm footing. Cranes equipped with outriggers shall have them all fully deployed following manufacturer's specifications, insofar as applicable, when hoisting employees.

f. The total weight of the loaded personnel platform and related rigging shall not exceed 50 percent of the rated capacity for the radius and configuration of the crane or derrick.

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g. The use of machines having live booms (booms in which lowering is controlled by a brake without aid from other devices which slow the lowering speeds) is prohibited.

h. Cranes and derricks with variable angle booms shall be equipped with a boom angle indicator, readily visible to the operator.

i. Cranes with telescoping booms shall be equipped with a device to indicate clearly to the operator, at all times, the boom's extended length otherwise an accurate determination of the load radius to be used during the lift shall be made prior to hoisting personnel.

j. A positive acting anti-two-blocking device shall be used which prevents contact between the load block or overhaul ball (pill) and the boom tip or, a two-blocking damage prevention feature shall be used which deactivates the hoisting action before damage occurs in the event of a two-blocking situation.

11. Personnel platform design and specifications

a. The personnel platform and suspension system shall be designed by a qualified engineer or a qualified person competent in structural design.

b. The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform.

c. The personnel platform shall be capable of supporting, without failure, its own weight and at least five (5) times the maximum intended load.

d. Each personnel platform shall be equipped with a top guardrail approximately 42 inches high, a midrail and a toeboard. The platform shall be enclosed at least from the toeboard to mid-rail with either solid construction or expanded metal having openings no greater than 1/2 inch.

e. A grab rail shall be installed inside the entire perimeter of the personnel platform. Access gates, if installed, shall not swing outward during hoisting. Access gates, including sliding or folding gates, shall be equipped with a restraining device to prevent accidental opening.

f. Headroom shall be provided which allows employees to stand upright in the platform.

g. In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when employees are exposed to falling objects.

h. All welding of the personnel platform and its components shall be performed by a qualified welder familiar with the weld grades, types and material specified in the platform design.

i. The personnel platform shall be conspicuously posted with a plate or other permanent marking which indicates the weight of the platform and its rated load capacity or maximum intended load. The platform must not be loaded in excess of its rated load capacity.

j. When not hoisting personnel, personnel platforms shall not be used to hoist materials or tools.

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ST0401850

12. Rigging

a. When a wire rope bridle is used to connect the personnel platform to the load line, each bridle leg shall be connected to a master link or shackle in such a manner to ensure that the load is evenly divided among the bridle legs.

b. Hooks on overhaul ball assemblies, lower blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut, or retaining pin may be used.

c. Wire rope, shackles, rings, master links, or other rigging hardware must be capable of supporting, without failure, at least five (5) times the maximum intended load applied or transmitted to the component.

d. All eyes in wire rope slings shall be fabricated with thimbles. Do not use rotation resistant wire rope slings.

e. Bridles and associated rigging for attaching the personnel platform to the hoist line shall be used only for personnel platform and shall not be used for any other purpose when not hoisting personnel.

13. Trial lift, inspection, and testing

a. A trial lift with the unoccupied personnel platform loaded at least to the anticipated liftweight shall be made from ground level, or any other location where personnel will enter the platform, to each location at which the personnel platform

is to be hoisted and positioned. This trial lift is to be performed immediately prior to placing personnel on the platform. The operator shall determine that all systems, controls, and safety devices are activated and functioning properly; that no interferences exist; and that all configurations necessary to reach those work locations will allow the operator to remain under the 50 percent limit of the hoist's rated capacity. A single trial lift may be performed at one time for all locations that are to be reached from a single set up position.

b. The trial lift shall be repeated whenever the crane or derrick is moved and set up in a new location or returned to a previously used location or if the lift route is changed.

c. After the trial lift and just prior to hoisting personnel, the platform shall be hoisted a few inches and inspected to ensure that it is secure and properly balanced. Employees shall not be hoisted unless the following conditions are determined to exist:

- i. Hoist ropes shall be free of kinks.
- ii. Multiple part lines shall not be twisted around each other.
- iii. The primary attachment shall be centered over the platform, and
- iv. The hoisting system shall be inspected if the load rope is slack to ensure all ropes are properly stated on drums and in sheaves.

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d. A visual inspection of the crane or derrick, rigging, personnel platform, and the crane or derrick base support or ground shall be conducted by a competent person immediately after the trial lift to determine whether the testing has exposed any defect or produced any adverse effect upon any component or structure. Any defects found must be corrected before hoisting personnel.

e. At each job site, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging shall be proof tested to 125 percent of the platform rated capacity by holding it in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done concurrently with the trial lift). After proof testing, a competent person shall inspect the platform and rigging. Deficiencies found must be corrected and another proof test conducted. Do not lift personnel until the proof testing requirements are satisfied.

14. Work practices

a. Employees shall keep all parts of the body inside the platform during raising, lowering, and positioning. This provision does not apply to an occupant of the platform performing the duties of a signal person.

b. Before employees exit or enter a hoisted personnel platform that is not landed, the platform shall be secured to the structure where the work is to be performed, unless securing to the structure creates an unsafe situation.

c. Tag lines shall be used unless their use creates an unsafe condition.

d. The crane or derrick operator shall remain at the controls at all times when the crane engine is running and the platform is occupied.

e. Hoisting of employees shall be promptly discontinued upon indication of any dangerous weather conditions or other impending danger.

f. Employees being hoisted shall remain in continuous sight of and in direct communication with the operator or signal person. Standard signals, hand or verbal, must be used and must be visible or audible to the operator at all times. Assure that the signal person(s) is knowledgeable in standard signals. In those situations where direct visual contact with the operator is not possible, and the use of a signal person would create a greater hazard for that person, direct communication alone such as by radio may be used.

g. Employees occupying the personnel platform shall use a body harness system with the lanyard appropriately attached to the lower load block or overhaul ball, or to a structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage.

h. No lifts shall be made on another of the crane's or derrick's loadlines while personnel are suspended on a platform.

i. Cranes shall not travel while personnel are hoisted.

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j. An additional employee must be positioned observe for proper winding of the cable on the winch drum during the hoisting and lowering operation.

k. Pre-lift meeting

i. A meeting attended by the crane or derrick operator, signal person(s) (if necessary the lift), employee(s) to be lifted, and the Owner Representative shall be held review the job and assure all the requirements of this standard are met.

ii. A Crane Safe Work Permit must be issued for each job requiring the lifting of personnel

iii. A Personnel Platform Lifting Checklist for lifting personnel (Refer to Section W, Page 89) must be used to ensure a safe lift. It should be signed by the Owner Representative, the crane operator, and the personnel being lifted.

15. When performing non-electrical work with power equipment (such as mobile hoisting, personnel aerial lift, drilling, dirt moving, or material handling machines) within ten feet of electrical distribution right-of-way, a Safe Work Permit shall be obtained from power distribution. In no case shall such equipment be allowed to work within ten feet of any energized uninsulated electrical line unless proper insulating barriers are erected.

Warning signs with the wording: "WARNING - UNLAWFUL TO OPERATE THIS EQUIPMENT WITHIN 10 FEET OF HIGH VOLTAGE LINES 50 KV OR LESS", shall be attached inside the cab of all mobile

hoisting, drilling, dirt moving, or material handling machines. Similarly worded signs, legible at 12 feet, shall be attached to the outside of these machines.

16. All 120 volt, single phase, 15 and 20 ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure, shall be protected by either:

- a. A Ground Fault Circuit Interrupter (GFCI), or,
- b. An assured equipment ground conductor program, with written description of the program. (OSHA 1926.404).

17. All pressure vessels of construction equipment shall be hydrostatically or air tested annually. Items in this category are those exceeding 6 inches (inside diameter) and with internal or external operating pressure exceeding 15 psig, or those protected by a relief valve with a setting greater than 18 psig, or by a rupture disc whose bursting pressure is greater than 25 psig.

a. These tests shall be performed during the month of January each year by the owner or renter of the equipment. Equipment with untested pressure vessels, arriving in the plant for the first time after the January test period, shall be visually inspected and accepted by the Owner's Representative and shall meet the above test requirements within 10 days. Such equipment must be retested the following January.

b. Relief valves shall be removed and vessels hydrostatically tested to one and a half times the allowable working pressure of the unit. Test per

ST0401855

ASME Code, Section 8, Division 1, Paragraph UG99, or pneumatic test to one and a quarter times the allowable working pressure of the unit. Test per ASME Code, Section 8, Division 1, Paragraph UG 100. A thorough visual external inspection shall also be made.

c. As a part of these test procedures, relief valves shall be properly sized and set for the vessel involved and checked for proper operation, apart from the vessel test.

d. Metal identification tags shall be attached to relief valves bearing pressure setting, date of test, name of company conducting test, and name of the person conducting the test.

e. Contractors shall furnish the E&CS Hoisting Coordinator a test certificate for each piece of equipment. Each certificate shall be signed by the test conductor and a representative of the company owning the equipment. The E&CS Hoisting Coordinator can be reached at the E&CS office, Building OC-1120, phone 238-9831.

f. The Contractor shall forward each certificate to the E&CS Construction office, Building OC 1120, where an equipment number will be assigned and the certificate will be kept on file. The Contractor will be informed of the assigned number by the hoisting coordinator.

g. Contractors shall paint or stencil the assigned equipment number in plain view on the equipment. The numerals shall be painted or affixed on a white background, and shall be approximately 3 inches high of a color assigned by

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the hoisting coordinator. The color will be changed each year, and the Contractor will be notified in December as to the color for the following year.

18. Electrical tools and equipment operating at more than 32 volts shall be properly grounded except the following:

a. Double insulated tools approved by Underwriters Laboratories.

b. Certain test equipment such as oscilloscopes, vacuum tube voltmeters and signal generators. Consult with Owner's Representative for exceptions.

c. Certain areas where D.C. equipment is used. Proper operational procedures in these areas must be ascertained from the Owner's Representative.

19. All manually held pneumatic, electric-powered, or hydroblast tools shall be equipped with a "dead-man" switch that is under the control of the tool operator and cannot be locked in the "on" position. Existing trigger locks shall be removed from all such tools.

20. 32 volt or less (12 volt for construction) electrical service (or 120 volt with GFCI) is to be used when working inside metallic vessels. Drop lights shall have protection guard over globe. Transformers shall be kept outside vessels.

21. In order to minimize the possibility of intermediate arcing during arc welding, the grounding lead must be connected as close as practical to the

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work piece and no splice within 10 feet of the stinger end.

a. When arc welding is to be done in an area restricted by a Safe Work Permit, the grounding lead shall be connected to the work piece within the limits specified in the permit.

b. All leads and lead connections shall be in good condition and free of any exposed conductors.

22. Tool rests on grinders shall be set not more than one-eighth-inch from, and level with, the center line of the wheel. Buffers are not to be operated with tool rests. Tongue guards shall be set not more than one-quarter-inch from the wheel.

23. Grinding wheels shall be checked for cracks and speed specifications before mounting.

24. Do not wear gloves while using grinders, buffers, pipe threading machines, drill presses, or similar rotating tools, unless covered by a written procedure.

25. Hose connectors and adaptors shall be of a standard manufacture and used only for the type of service intended.

a. In order to ensure positive locking at all times, hose connectors shall be in good condition and not abused. Sandblast hose connections shall be the safety lock type which prevents accidental disengagement.

ST0401858

b. Quick connectors used for air and cold water (under 140°F) shall not be compatible with quick connectors used for nitrogen or other services.

c. Bleed down pressure on the pneumatic hose prior to changing equipment unless the hose can be disconnected using a fitting designed to be disconnected under pressure.

26. Powder-actuated fastening guns shall be used only in accordance with the following procedure:

a. Whenever it is planned to use such equipment on a job, the Contractor's Representative shall submit to the Owner's Representative:

i. Written notice of intent to use such equipment;

ii. A written Safe Work Procedure covering use of equipment; and

iii. The qualifications of the employees who will use the equipment. (Users must comply with ANSI Standard Number A-10.3)

b. The Owner's Representative shall, if satisfied with the submitted procedure and the qualifications, give the Contractor's Representative written permission to proceed.

27. Fixed blade knives used as tools of the trade shall be carried in sheaths when not in use.

I. LADDERS, PLATFORMS, ROOFS, AND SCAFFOLDS

1. Applicable to all ladders

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ST0401860

a. All ladders shall be heavy duty, non-conductive, industrial strength, Type I. (Tank ladders inside vessels are excluded).

b. The user is responsible for visually inspecting a ladder before use and ensuring the ladder capacity is not exceeded. Any ladder found defective shall be tagged, removed from service, and repaired or destroyed.

c. Wooden ladders are not to be coated with anything other than clear preservative.

d. Ladders are not to be used as pencil or scaffold boards.

e. Use both hands for climbing.

f. Only one person is permitted to climb a ladder at a time.

g. No ladder shall be used to gain access to a roof unless the top of the ladder shall extend at least 3 feet above the point of support, at eave, gutter, or roof line.

2. Step ladders

a. Step ladders over 10 feet must be tied off at the top or be held by another worker.

b. Personnel must not stand on the cap or top step of a stepladder. (Top step is defined as the first step below the cap.)

c. Step ladders are not to be used as a straight ladder.

3. Straight and Extension Ladders

a. Top sections of extension ladders shall not be used by themselves except for restricted entry into vessels, furnaces and for scaffold access when properly tied off.

b. All straight and extension ladders must be tied off within three rungs of the top. Ladder must be held by another person while being tied off.

c. Extension ladders shall have one of the lower rungs of the upper section tied to the adjacent rung of the lower section when in use.

d. All straight and extension ladders must be equipped with non-skid feet.

e. Straight and extension ladders shall be placed at such an angle that the base is one-fourth of the working length of the ladder out from the top support; e.g. 20 feet up 5 feet out, or one rung out for each 4 feet up.

f. Maximum height: Straight ladder, 24 feet. Extension ladder, 40 feet.

4. Platforms

Make shift platforms, such as stacked material, chairs, boxes or drums shall not be used.

5. Scaffolds (General)

a. All scaffolds must be plumb and level at all times.

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b. Provide sufficient footing (mud sills or base plates) on all scaffolds to be erected. Do not use scaffold boards as mud sills.

c. All work levels of a scaffold, if practical, must be fully planked on completion. If, of necessity, a work platform is not completely planked or hand-rail not adjusted, personnel working on that platform must use properly attached body harness.

d. Scaffold boards shall be used exclusively for work platforms and not for any other service.

e. All scaffolds shall be locked in or tied off at every 18 feet of elevation. Anchor or brace the running scaffold approximately every 28 feet.

f. A ladder or safe access shall be affixed or built into the scaffold and so located that, when in use, it will not have a tendency to tip the scaffold. A landing platform must be provided at intervals not to exceed 30 feet.

g. All scaffolds, regardless of height, must be equipped with handrails (36" to 42") and midrail at a height sufficient to provide maximum personnel safety. Handrails and midrails may be omitted only upon Owner's WRITTEN permission.

h. When one side of a scaffold is left open (without guardrails) to facilitate work being performed (such as against building wall or tank walls), there should be no gaps greater than 11 inches between the work platform and adjacent structure.

i. All scaffolds must be equipped with toe boards at least 4 inches (2 x 4 nominal) in height on all

sides. Additionally, when the circumstances are such that toe boards cannot be installed, a sign must be installed on the ladder side stating "DANGER OVERHEAD NO TOE BOARDS ON SCAFFOLD." Also, the area must be taped off with yellow caution tape.

j. Scaffolds must not be used as material hoist towers or for mounting derricks without first determining the loads and stresses involved.

k. Precautions must be taken when erecting scaffolds near heated equipment to eliminate fire hazards.

l. No scaffold shall be erected, moved, dismantled or altered except by trained personnel. Contractors are responsible for training their personnel.

m. No scaffold shall be erected closer than eight feet and nine inches from the center of the railroad tracks without permission from the Rail Car Handling Department. If the scaffold straddles the railroad track, the first deck must provide a clearance of 22 feet, 6 inches from the top of the rail.

n. When use of No. 9 soft annealed wire is absolutely necessary, a minimum of two separate strands must be used to tie scaffold handrails, braces, etc. The ties must be crossed to form a lock to prevent slipping in any direction.

o. All scaffolds left uncompleted shall have a sign attached to the ladder side stating: SCAFFOLD INCOMPLETE - DO NOT USE.

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p. All load-bearing timber members of scaffold framing shall be a minimum of 1500 f. (stress grade) construction grade lumber.

q. Wooden decking boards shall be of scaffold plank No. 65 untreated dense structural No. 1 or better (2 x 10, 2250 dense) and shall not be painted.

r. When erecting scaffolds within 10 feet of electrical distribution right-of-way, a Safe Work Permit must be obtained from Power Distribution. Scaffolds shall not be built within 10 feet of any energized uninsulated electrical lines unless proper insulating barriers are erected.

s. Tools, materials and debris shall not be allowed to accumulate on the scaffold landings.

t. Drawing and specifications for all scaffolds over 125 feet in height above the base plates shall be designed by a registered professional engineer and copies made available to the requestor for inspection purposes.

u. Frames and accessories for scaffolds shall be maintained in good repair.

v. All scaffold platforms and tubes shall be free of tools, trash, etc. before removal.

6. Tubular Welded Frame Scaffolds (Patented Metal Scaffolds)

a. Maximum loading of a tubular welded frame scaffold: Three people and a dead load not to ex-

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ceed 200 lbs. or a total distributed load not to exceed 800 lbs.

b. Scaffold must be erected with proper fixtures made for each type of scaffolding. Scaffold and associated equipment must not be modified in any manner that reduces the manufacturer's designated performance.

c. Scaffolds 18 feet or over shall have horizontal bracing at the bottom and intermediate levels of 20 feet.

d. Cleated planking overhang shall be a maximum of 4 inches on stack-up scaffold; 2 x 4" toe boards shall be wired. If cleated boards are not used, overhang shall be a minimum of 6 inches and 2 x 4" toe board shall be wired and nailed.

e. Decking on tubular welded frame scaffold shall have 2" x 2" cleats on the ends when practical. Cleats shall be bolted on underside with 1/4" bolts.

7. Tube and Coupler Scaffolds

a. Posts shall be accurately spaced, erected on suitable base and maintained plumb.

b. Ledgers shall be erected along the length of the scaffold, located on both sides at even height. Ledgers shall be coupled to each post. The bottom ledgers shall be located as close to the bottom as possible. Ledgers shall be placed not more than 6 feet on centers.

ST0401866

c. Ledgers shall be installed transversely between posts and shall be securely coupled to the posts bearing on the ledger coupler. When coupled directly to the ledger, the coupler must be kept as close to the post as possible and the ledger backed by extra coupler below the ledger.

d. Ledgers shall be at least 4 inches but not more than 12 inches longer than the post spacing or ledger spacing.

e. Cross bracing shall be installed across the width of the scaffold where possible, horizontally at the bottom and approximately every 20 feet.

f. When using a cantilever, more than 2 boards require knee braces.

g. All clamps shall be installed with nut part up.

h. Ladder cage must be installed on heights over 30 feet.

i. On spans of 10 feet or more, decking boards must be doubled or extra ledger installed midway.

j. When toe boards cannot be wired down on ladder side of scaffold, a ledger shall be installed for handhold over toe boards.

8. Wood Pole Scaffolds

a. Maximum loading of wood pole scaffolds: Three persons and a dead load not to exceed 200 lbs., or a total distributed load not to exceed 800 lbs.

b. Maximum span between ledgers shall be 7 feet.

c. A sheer block will be installed beneath the ledger at each post.

d. Where planking is lapped, each plank shall lap its end support at least 6 inches, for at least a 12 inch board lap.

e. Bracing shall be at least 1 x 4 inches or larger.

f. Handrails and midrails shall be 2 x 4 inches.

g. Decking shall be nailed with 12d nails or larger.

h. Maximum span of the ledger is 10 feet, using a 2 x 10 inch on edge.

i. Where wood poles are spliced, the ends shall be squared and the upper section shall rest squarely on the lower section. Wood splice plates shall be provided on at least 3 adjacent sides and shall not be less than 4 feet in length, overlapping the abutted ends equally and have the same width and not less than the cross-sectional area of the pole. Splice plates of other materials of equivalent strength may be used.

j. Longitudinal diagonal bracing shall be installed at approximately a 45 degree angle from the base of the first outer post upward to the extreme top of the scaffold as required.

9. Rolling Tower Scaffolds

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a. Towers of a height greater than three times the minimum base dimension must be guyed or tied off while being used.

b. Caster brakes must be locked while the scaffold is not being moved.

c. Extreme care must be exercised while moving rolling scaffold.

d. Towers must be free of people, material, and equipment before moving.

e. The surface upon which the tower is rolled must be free of rubble or any material that may cause the tower to tip.

f. Do not attempt to move a rolling tower without sufficient help.

g. The minimum size for casters shall be 6 inches. Scaffolds higher than 25 feet must be stabilized either with outriggers or hand lines while being moved.

h. All rolling scaffolds require diagonal braces starting with first section.

i. Cantilevered side brackets when required shall be no more than 2 boards wide.

10. Suspended Scaffolds

a. Maximum loading of suspended scaffolding: Two people and a dead load not to exceed 200 lbs. or a total-distributed load not to exceed 600 lbs.

b. All suspended scaffolds shall be anchored to prevent swinging. Chains shall be securely fastened by tying chain together by twisting No. 9 wire through the links, or mousing wire through hook when hook is fastened on chain.

c. The maximum distance between chains on the "bearer" (4" x 4") shall be 6 feet.

d. Steel chain of 1/4" minimum shall be used to support suspended scaffolds.

e. Safe load limits for chain: 1750 pounds, proof tested to 2350 pounds. "Bearer" shall be a 4" x 4" or larger and shall be hand selected, No. 1 Grade 1700 or equal.

f. Screwed flange pipe or plastic pipe shall not be used as support for swing scaffold.

J. RED DANGER TAGS

1. Training

All personnel who use Red Danger Tags must be trained before initial use, and at least annually thereafter as per Contractor procedures. The following items must be included in the training program.

a. The general procedures included in the following Red Tag Safety Rules.

b. The procedures specific to the Contractor relative to the use, placement and removal of Red Danger Tags and the Red Danger Tag Master System.

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2. Use

- a. For the protection of personnel, Red Danger Tags must be attached to isolating devices to ensure the tagged isolating device is maintained in the safe position.
- b. In all cases the primary isolating device (first in rank) must be tagged.
- c. Attachment of Red Danger Tags to isolating devices alone does not mean the equipment has been cleared to work on.
- d. Each Contractor shall develop and implement written procedures specific to their area for the use, placement, inventory, removal, and disposal of Red Danger Tags.
- e. The Owner may delegate the responsibility for placement and removal of Red Danger Tags if covered by a written job procedure approved by the department head.
- f. Red Danger Tags are not to be used on in-operative equipment such as damaged tools or ladders. Red Danger Tags are to be used only on isolating devices.

3. Conformance

- a. No isolating device is to be operated by anyone while a Red Danger Tag is attached.
- b. Red Danger Tags shall not be altered or re-used on another job.

4. Violation

Violation of Red Danger Tag rules shall result in disciplinary action by Contractor Management up to and including rejection from any work on Owner's property.

5. Placement

a. The person attaching the tag shall fully complete in specific terms the reasons for tagging, the description of the work to be done and the precise location of the tag.

b. The Owner will be responsible for placing all of the isolating devices in the safe position and attaching the first Red Danger Tag.

c. After the Owner has attached the first Red Danger Tags, any person or group whose safety could be endangered by the operation of the isolating device must attach their Red Danger Tags or follow Red Danger Tag Master System.

6. Removal

a. As the individual jobs are completed, each person or group must remove their tags immediately. Owner departments have written procedures which provide for continuity of responsibility for protection of personnel involved in shift change, job interruptions, end of day, etc.

b. Owner operating personnel Red Danger Tags shall be removed last. A person who is authorized to remove this Red Danger Tag must not remove the tag until he/she has determined

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the operation of the tagged isolating device will not endanger personnel.

c. Red Danger Tags may be removed only upon authorization of the person designated on the tag, except if the designated person fails to remove the Red Danger Tag, and after a diligent effort to locate this person has been made, personnel who have been designated by the Major Manager of the department who placed the first Red Danger Tag may order its removal. These designated personnel may order removal only after inspecting the job site.

d. The "Removed By" section of the tag shall be filled in and the tag disposed of according to operating department procedures.

7. Intermittent Operation

If an isolating device must be operated intermittently, such as for testing equipment, the Red Danger Tag shall be detached before each operation. The Red Danger Tag may be re-used on the same job if the scope of the job has not been changed.

8. Work on Red Tagged Isolating Devices.

a. Work must not be done on an isolating device if the work reduces or eliminates the protection provided by the isolating device.

b. Approval from the equipment owner and the Owner Representative are required before any work is done on equipment tagged with a Red Danger Tag.

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9. Red Danger Tag Master System

a. Owner tags must be placed first.

b. A Dow employee, with maintenance responsibility, must review the field Red Danger Tag locations and is responsible to attach (or have attached) the second Red Danger Tag to each location and then sign the Red Danger Tag Master as accepting the clearance.

c. A job number or other identifying system will be assigned the Red Danger Tag Master and each field Red Danger Tag will be identified by this system.

d. A positive means, verified before each use by the owner, such as job procedures, a tagging point checklist, or drawing, must be used with each Red Danger Tag Master as a way for the maintenance personnel to verify Red Danger Tag location for acceptance of the clearance.

e. Each function wishing to work under the Red Danger Tag Master shall review the location of the Field Red Danger Tags and sign the Red Danger Tag Master.

f. After completion of the work, each group working under the Red Danger Tag Master will sign the Red Danger Tag Master thus releasing the clearance.

g. Only after the Red Danger Tag Master has been released by all non-owner groups can the Red Danger Tags be removed from the field locations.

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h. After release of the Red Danger Tag Master by all maintenance personnel, the Owner can remove the Red Danger Tags in the field and clear the Red Danger Tag Master.

K. SAFE WORK PERMITS AND AREA PERMITS

1. Safe Work Permits are issued by the Owner to Contractor personnel and are required for the following:

a. Certain electrical jobs as defined in Section U of this manual.

b. Line/equipment opening such as pipelines, pumps or vessels which contain or have contained hazardous temperatures, pressures or materials.

c. Hot work (non-electrical) - Any work performed in hazardous areas that may be or may generate a source of ignition. (All Texas Operations pipeways are to be considered hazardous process areas unless specified as non-hazardous.)

d. Hot tapping - mechanical cutting, drilling, boring, etc. into a line or equipment containing hazardous material or pressure.

e. Confined Space Entry - Entry is defined as passing one's head beyond the plane of an opening. A confined space may be any space not designated for continuous occupancy with limited openings for entry and exit. Confined spaces include but are not limited to, all vessels, tanks, tower and vessel skirts, boilers, furnaces, pipes, ventilation and exhaust ducts, silos and vats.

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Pits, trenches and cooling tower basins which could contain, hold or produce dangerous air contaminants shall be considered confined space.

i. The confined space to be entered shall be made safe by the Owner before the issuance of the Safe Work Permit and the entry of any personnel by:

(a) isolating the confined space from all potential sources of hazardous materials.

(b) clearing the confined space of hazardous material.

(c) inspecting and testing the confined space and any unisolated appendages with an explosimeter and an oxygen indicator.

(d) providing forced ventilation to the confined space unless there is written approval from the Owner's Representative that it is not required.

(e) providing a safe means of access and egress for persons entering the confined space.

ii. Contractor shall station a trained standby person outside an entrance to the confined space to establish direct two-way communications between standby person and personnel in the confined space.

f. Machine Excavation - The penetration of the ground by the use of a machine. When machine excavation is to be done (gradalls, draglines, augers, pile drivers, ditch digging machines,

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etc.), the Safe Work Permit shall clearly state the excavation areas prior to any digging. The location of underground lines or equipment shall be verified by manual digging, probing or other reliable means acceptable to the Owner's Representative. No machine excavation shall be permitted where the closest point of the excavation is less than two (2) feet to any existing buried installation containing hazardous temperatures, chemicals, pressures, electricity or equipment that provides critical service as designated by the Owner's Representative. If any underground installation is struck during manual digging or machine excavation, the Owner's Representative shall be notified immediately. Hitting any installation automatically cancels the work permit.

g. Hydroblasting - See Section R

h. Abrasive Blasting - See Section T

i. Radiography - See Section P

j. On-line leak repair.

k. Asbestos related jobs - See Section S

l. Mobile hoisting for cranes having a capacity greater than 10 tons, for any critical lift or for lifting personnel.

m. When requested by contractor personnel doing the work.

n. As required by Departmental Operations Policy.

2. Contractor supervision shall be in close contact with the progress of the work and shall be in constant communication with the Owner's Representative for up-to-date status of operations. Further, Contractor supervision shall be certain that all personnel involved are informed as to specific procedures and changes in the situation.

3. Safe Work Permits are to be initially requested through the Owner's Representative. Safe Work Permits will be issued only after a physical check of the job site by the person issuing the permit, the person receiving the permit and at least one of the persons performing the work.

4. Safe Work Permits issued for jobs that last longer than one day will normally be issued for that job each day. By mutual consent of the parties involved, permits for these jobs may be issued for longer periods of time.

5. Area Permits are designed to provide COMMUNICATIONS between the Owner and the Contractor. An area permit IS NOT a Safe Work Permit. When it is issued, it is to agree that the work the Contractor has outlined will not pose a hazard to the Owner and will not create a hazard for the Contractor. Several area permits may be required before the Owner can issue a Safe Work Permit.

L FALL RESTRAINT SYSTEMS

1. A fall restraint system shall be used by personnel in work areas not protected by guardrails where there is a danger of employees falling from a distance of six (6) feet or greater. Work areas include all surfaces except ladders, vehicles and flatbed trailers.

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Exception:

a. In erecting or dismantling scaffolds, the person on the top level of a scaffold is allowed to work without an attached lanyard when there is nothing adjacent at a higher level or same level to provide fall protection. This does not apply to suspended scaffolds.

b. When personnel are on low pitched roofs having a slope less than or equal to four in twelve to inspect, investigate or estimate roof level conditions.

2. The primary fall restraint device shall be a Class III body harness. The lanyard anchorage point must be such that the maximum fall distance is four feet, or six feet if the lanyard is used in conjunction with an ANSI approved shock absorber.

3. The use of a Class I body belt must have approval of the Owner Representative and the free fall distance must be restricted to two feet or less. Lineman's belts utilized for climbing and working on poles and other positioning devices used by form workers are acceptable fall restraint devices.

4. Personnel shall be trained in the correct use of fall restraint devices.

5. Approved safety lanyards shall be a minimum of 1/2 inch nylon or equivalent. Lanyards will have double locking snap hooks.

6. If a lanyard made of synthetic fibers is subject to come in contact with hot surfaces such as uninsulated steam lines, valves, or hot furnace stacks, an insulated cover must be used for protection. This

can be either on the lanyard or the hot surface. Lanyards must be protected against sharp surfaces.

7. Fall restraint devices exposed to impact loading shall be removed from service and destroyed.

8. When personnel are working off portable ladders and the work requires them to be outside the confines of the ladder, a fall restraint device must be used. Confines of the ladder is defined as maintaining the belt buckle area within the ladder side rails.

9. Personnel working from or riding in any aerial lift device shall wear a fall restraint system with the lanyard attached to the boom or basket.

10. Personnel engaged in roofing work on low-pitched roofs having a slope less than or equal to four in twelve, shall be trained in the fall hazards of working near roof perimeter, the erection and use of Motion-Stopping-System, the warning line and safety monitoring systems, and job procedures required for roof work. Fall restraint systems for low pitched roof work are:

a. A Motion-Stopping-Safety-system (MSS system) providing fall protection by using the following equipment singly or in combination: guardrails, scaffolds or platforms with guardrails, safety nets, and body belt/harness systems.

b. A Warning Line System erected not less than six feet from roof edges not having other means of fall protection where there is danger of personnel falling. If personnel are working outside the warning line system, an MSS system or a safety monitoring system must be used. A Warning Line System is a temporary rope, wire or chain

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and supporting stanchion erected not less than six feet from the edge of the roof and flagged at no more than 6 foot intervals with high visibility material.

c. A Safety Monitoring System on roofs fifty feet or less in width where mechanical equipment is not being used or stored. Safety monitoring system is a system in which a competent person monitors the safety of all employees in a roofing crew and warns them when it appears to the monitor that they are unaware of the hazard or are acting in an unsafe manner. The competent person must be on the same roof and within visual sight and voice communication of the other employees.

11. Inspection and Testing

a. Fall restraint devices shall be visually inspected for defects by user prior to use.

b. Fall restraint devices shall be inspected when new and every six months thereafter. Inspect for cuts, burns, excessive wear and distorted thimbles. The date of each inspection shall be recorded on an inspection tag and permanently attached to the device.

M. BARRICADES AND GUARDS

1. Barricades

A device to prevent or limit access to an area where a temporary hazard exists or to warn personnel of a temporary hazard in an area.

a. Acceptable barricade materials include but are not limited to:

- i. High visibility tape, colored plastic chain, or yellow rope 1/2" diameter or larger.
- ii. Rubber or plastic traffic cones.
- iii. Sawhorses (flasher lights for hours of darkness).
- iv. Metal or wood guard rails.

b. Examples of areas or situations where barricades shall be used include, but are not limited to:

- i. Areas below overhead work.
- ii. Areas below welding, cutting or burning operations.
- iii. Hazardous leaks, spills, or releases.
- iv. Sandblasting.
- v. Asbestos removal.

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vi. Hydroblasting.

vii. Radiography.

viii. Open trenches, ditches, or holes.

ix. Roadways or walkways blocked by equipment.

c. When erecting barricades, other than approved guards, an information tag (green tag) or sign shall be attached to the barricade denoting, in detail, the nature of the hazard.

d. When the necessity for barricades no longer exists, they shall be removed immediately.

e. Owner's Representative must be notified before barricading or blocking any in-plant roadway.

f. A standby person may be used in place of a barricade. If the standby person must leave for any reason, a barricade must be erected.

2. Guards

A type of barricade designed to physically prevent a person from falling through or stepping into temporary openings in platforms, landings, floors, walls, etc.

a. Standard railing consisting of a top rail, intermediate rail and toe board. Railing shall be at least 42 inches in height and must withstand a 200 lb. load applied at any point on the top rail.

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Railing can be constructed of wood or structural steel.

b. Cover constructed of any material that is capable of carrying a load equivalent to the rating of the floor or grating when applied perpendicular to the surface at any point on the cover. Necessary provision must be made to prevent cover from sliding, floating, or otherwise moving off the opening.

c. A standby person may be used in place of a guard. If the standby person must leave for any reason, a guard must be erected.

N. EXCAVATIONS

1. Where a safety hazard would be created for the personnel involved, and/or others, excavations such as ditches, trenches or bell holes shall be sloped sufficiently to prevent cave-ins or slides. If sloping is impractical, shoring must be used in cases wherever the vertical dimensions exceed five feet. (Reference: OSHA Construction Standard, 1926.652)

2. Personnel removing shoring after completion of work must not be in the bottom of the excavation. Shoring must be removed in such a manner to prevent cave-in on personnel.

O. RAILROAD DERAILS, BLUE FLAGS AND CLEARANCES

1. Blue flags and derails, other than those used by the Owner for loading/unloading operations, are primary isolating devices and are required for the protection of all approaches for jobs being performed on or within an area of 22 ft. 6 in. above the

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rail and 8 ft. 9 in. from the center of the track. Red Danger Tags shall be attached to the derail in accordance with Red Danger Tag rules and procedures, except for loading/unloading operations. Blue lights are required at night.

a. Derails must be placed a minimum of fifty (50) feet in front of the area they are intended to protect (all approaches). Exceptions to the minimum distance may be made by the Owner's Representative where existing installations do not allow sufficient space.

b. Blue flags (and blue lights at night) shall be placed at least five feet in front of the derail so that rail cars will pass over the blue flags before contacting the derail. Blue flags shall be visible to oncoming trains and affixed to the outside of the track.

c. A written permit is required from the Railroad Operations Department at A-2701 or B-123 for the use of temporary/portable derails and blue flags/lights. Derails and blue flags will be issued at the same time the permit is written.

d. When the job being protected is complete, remove Red Danger tags following the Red Danger Tag procedures. Clear the track for resumption of normal operation by removing derails, blue flags, and/or blue lights. Return temporary derails and blue flags to the Railroad Operations Department along with the permit.

e. Any excavation work within eleven (11) feet from the center of the track must have written approval of the Rail Track Maintenance superintendent.

P. INDUSTRIAL RADIOGRAPHY

1. Training

a. The source Owner or Contractor shall instruct all their employees about the potential for over-exposure to ionizing radiation in both general safety and radiation safety prior to job assignment.

b. Personnel shall be trained according to the American Society for Nondestructive Testing TC-1A or approved documented alternative.

c. All Radiographers shall go through a special orientation program conducted by Dow's Metals and Mechanical Technology Group (Phone 409/238-2525, B-2406) prior to any work within Texas Operations. This orientation will be documented on an orientation certification card issued annually. Radiographers may be permitted to work without this orientation only on an emergency basis with the specific approval of Dow's Radiation Safety Officer (RSO) or his designee. This orientation is not intended to take the place of training as outlined in a & b above.

2. Procedures

a. Vehicles transporting and areas containing radiation sources, or any other radiographic operation, shall be clearly marked with appropriate signs and/or tape indicating a potential radiation hazard.

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b. Dow Safety Standard (O-47) must be conveniently located on all radiographic vehicles used on Dow job sites. Other required documentation as per state and/or Department of Transportation (DOT) regulations will be located in the radiographic vehicle (e.g. source decay chart, Operations and Emergency Procedures, radioactive materials license, etc.).

c. All radiography will be conducted by a minimum of two (2) people in the crew.

d. Radiography Safe Work Permits shall be issued along with appropriate Safe Work Permit by Dow supervision before any radiography is started. (Refer to Section W, Page 89)

e. Area control shall be required as follows:

i. See that control of areas is maintained with the use of signs, radiation tape (yellow and purple) or other effective means, so that no individual could receive in any one hour a dose in excess of 2mr. Verify the above by calculation and by the use of an operable, calibrated radiation survey meter.

ii. Under no circumstances will the controlled area be less than twenty-five (25) foot radius.

iii. In multi-level structures, personnel other than the radiography crew shall be cleared out of the affected area. Signs and radiation tape, or rope, shall be placed at each entrance to the affected area.

iv. Where work is adjacent to a roadway, arrangements must be made with Industrial Security to barricade the road during radiographic operation when the calculated 2mr perimeter intersects the road.

v. Sketch the work area and indicate the calculated 2mr perimeter.

3. Emergencies

a. The Contractor will develop an emergency plan to include suitable emergency equipment. This will be reviewed annually and a copy sent to the Dow Radiation Safety Officer.

b. All emergencies, where it is believed that a radioactive device is involved, must be reported to Industrial Security by dialing 66666. Industrial Security will then notify the Dow Radiation Safety Officer. If there is any doubt about the safety of personnel due to radiation, the area must be cleared and not be entered until it has been determined to be safe by the Radiation Safety Officer or his designee.

Q. DEMOLITION

1. Due to the inherent hazards in demolition work, special care must be devoted to safe procedures, scope understanding and communications concerning the safe performance of work.

2. Responsibility for field supervision of demolition work must be delegated only to those whose experience qualifies them to make the necessary judgments and decisions that are required to assure the safest possible completion of the job.

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3. The Contractor shall make certain that all lines, services and equipment have been cleaned or purged and properly cleared for safe removal. All lines (including water and steam) are to be considered "hot" until positive safe clearance has been obtained.

4. Special care shall be exercised to locate and mark old underground or otherwise hidden lines, cables and sewers using the best available information and Owner's assistance.

5. The pre-job safety conference with the Contractor, as covered in Section A.3, of this manual, shall devote special attention to pre-planning the safety aspects of demolition jobs.

a. Steps of dismantling and loads to be handled shall be reviewed with the Owner's Representative prior to starting work.

b. Temporary provisions shall be made where safety showers, eye-wash baths and fire extinguishers are being moved in the work area.

c. Special attention shall be given to the marking of hazards and the barricading of hazardous areas for the protection of all personnel, including those not directly involved in the demolition work.

R. HYDROBLASTING

1. Training

a. All members of the hydroblasting crew will be certified by their supervisor or crew leader as being operators or operator trainees and will

have been indoctrinated in Dow and block safety rules prior to commencing the job.

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2. Area Preparation

a. The presence of a hydroblast operations must be communicated to all persons working in the immediate area. The hydroblast work area should be taped off with a minimum radius of ten (10) feet.

b. The back side of tube bundles and other such equipment must be protected with a splash board to protect the areas from flying debris.

On cleaning vertical equipment, hydroblaster shall use devices to deflect waterblast away from personnel and prevent total removal of lance from the equipment -- or work on a scaffold at least three (3) feet above the surface of the equipment being cleaned and wear metatarsal protectors.

3. Pressures

a. Water pressure and volume should be kept at a minimum to do the job. Maximum pressure for hand operated equipment shall not exceed 2000 psig inside any confined space unless a four (4) foot minimum barrel length is used.

b. Pressures in excess of 10,000 psig will not be used without a specific procedure being written for the job and approved by the Owner's Representative.

ST0401889

4, Equipment

a. For "shotgunning" in open areas, the barrel (from deadman switch to nozzle) shall be a minimum of four (4) feet.

b. The hose must have a maximum allowable working pressure equal to or greater than the pressure required to do the job. Hoses and other equipment must be tested at 1-1/2 times the maximum allowable working pressure on a quarterly basis and visually inspected before every job.

c. The lance orifice openings will be designed to minimize backward thrust based upon operating pressures to be used and flow rate for hand held operations.

d. The following equipment will be the minimum for personnel: slicker suit, steel toed rubber boots, mouthbit respirator where required, sideshield safety glasses, face shield, rubber gloves, and plastic hard hat. For hearing protection purposes, personnel should remain at least twenty (20) feet from the pump. Personnel working within twenty (20) feet of the pump for more than thirty (30) minutes must use hearing protection. Any time blasting work is being performed in a confined space, hearing protection will be worn as the noise level tends to be greater as a result of the "echo chamber" effect.

e. During flexible lance hydroblast operations, an eighteen (18) inch straight lance (stinger) will be attached to the working end and the nozzle attached to it. In smaller pipes or tubes where this is not possible due to connector size, the flexible

lance must be conspicuously marked eighteen (18) inches from the end.

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5. Special Requirements

a. A Pre-job Checklist shall be completed by the hydroblasting crew and the Owner's Representative prior to starting the job. (Refer to Section W, Page 89)

b. An observer (a crewman other than the lance operator) will be present during all hydroblast operations. He will continuously observe the actions of the lance man and surrounding conditions. In the event of an injury, gas release, fire, etc., he will be responsible for notifying the lance man, shutting down the pump, and taking the proper action for the situation.

c. In all situations except line moleing, the operator or individual closest to the nozzle tip will be in control of the on-off switch (deadman). In a line moleing type operation where the equipment would make this more of a hazard, the hydroblast crew supervisor will use his best judgement to determine location of the switch and caution operating personnel that good two-way communication must be maintained at all times. Additionally, on line moleing operations, consideration should be given to the diameter of pipe being cleaned versus the diameter of the moleing hose being used to prevent mole line reversal.

d. A Safe Work Permit is required for all hydroblasting jobs. The following minimum items should be covered:

ST0401891

block emergency plan, isolated status of equipment, chemical hazards, protective equipment required, Pre-job Checklist, barricades, and close out requirements.

S. ASBESTOS

1. The Contractor is responsible for assuring that all contractor employees who handle asbestos are trained before initial assignment and annually thereafter. This training shall comply with the requirements of OSHA 29 CFR 1910.1001, OSHA 29 CFR 1926.58 and the Texas Operations Asbestos Handbook when made a part of the job specifications.

2. All jobs involving asbestos or asbestos-containing material must have written job procedures.

3. Refer to Section V for Occupational Health and Hygiene Requirements.

T. ABRASIVE BLASTING

1. A blasting zone shall be established at a distance of 50 feet around the blasting operation when wind speeds are 5 mph or greater. When wind speeds are less than 5 mph, the zone shall extend 100 feet in all directions from the blasting nozzles. If multiple nozzles are working and the distance between them is less than 50 feet, the downwind blasting zone should be extended 1.5 times for each additional blast nozzle.

2. Blasting zones shall be taped off with yellow tape stating that respiratory protection is required (tape available from local safety supply stores) or warning tags applied to yellow tape stating that respiratory protection is required. When placement of yellow

tape is not feasible, portable signs shall be used to mark the limits of the blast zone stating that respiratory protection is required.

3. An abrasive blasting respirator (hood) shall be worn by all abrasive blasting operators. When using sand as the abrasive, blasters in the blasting zone will remove their air supplied hood and wear a dust respirator until they are out of the blasting zone, even if there are no other people blasting.

4. The air hose used with the blaster's respirator shall be capped or equipped with a quick-connect fitting that seals the hose to prevent dust or contaminants from entering the hose. The blaster should clear the hose prior to connecting it to the respirator.

5. Employees should not enter the blast zone unless their duties require such entry. All employees whose duties require them to work in the blast zone shall wear a dust respirator as minimum respiratory protection. Respirators will be worn during the clean-up operation.

6. Sandblast hose connectors shall be wired in place to prevent accidental separation and hoses secured together across connection approximately 12" behind the connectors, so that the sections cannot whip if they separate.

U. ELECTRICAL WORK

1. General Rules — The following listed electrical safety rules are the minimum requirements for performing electrical work.

ST0401894

a. Contractor personnel, when performing electrical work within an existing operating facility, shall conform to additional safety rules which are applicable to the specific area in which the work is performed.

b. Work on and/or adjacent to exposed electrically energized equipment shall be done only with the permission of the Owner's Representative and in accordance with specific written safety procedures. Refer to Section U.4 and U.6.

c. Work on de-energized electrical equipment (electrical facilities which have been previously placed in service) will require compliance with written clearing procedures and required permits. Refer to Section U.3.

d. Placement of underground electrical facilities will require an excavation permit as outlined in Section K.1.1.

Placement of ground rods and earth anchors will require proper clearance by the Owner's Representative.

e. Any permanent electrical grounding connections or facilities which are disturbed or damaged by the Contractor's operation must be reported immediately to the Owner's Representative.

f. Requirements for prevention of electrical shock hazards involving the use of portable generators or welders and portable electrically operated, cord and plug connected, equipment and tools are outlined in Sections H.16 and H.18.

g. Electrical insulating protective equipment, such as rubber gloves, blankets, hoses, boots, etc. shall be tested and labeled or recorded at six month intervals and maintained in a safe condition.

2. Procedures for working 120 volt AC or DC equipment.

a. Contractor shall request Owner's Representative to de-energize and place a Red Danger Tag on the circuit or equipment to perform the proposed work. The circuit or equipment shall be tested for no voltage with a voltage indicating device. Each disconnected device involved shall have a Red Danger Tag installed and equipment checked for possible auxillary circuits which could apply a feed-back voltage. Clear auxillary circuits as approved by Owner's Representative.

b. If the equipment cannot be de-energized and can safely be worked hot, the Contractor shall prepare and submit to the Owner's Representative, a written hot work procedure (refer to Section U.6), listing the precautionary safety measures to be used to prevent electrical shock or flash. Safety measures considered shall include, but not be limited to, equipment, instruments, tools, barricades, protective clothing, and qualifications for the personnel involved in the work. Only experienced electrical craftsmen shall perform the work.

3. Clearing procedures for work on electrical equipment.

a. This section governs the clearing procedures to be used for all work on de-energized electrical

equipment (440 volt AC or above and 250 volt DC or above) shown on construction electrical one-line drawings or Owner's Safety Electrical One-Line Diagram, and associated electrically driven equipment.

b. Written electrical clearing procedures shall be used prior to beginning any work, to establish a de-energized status on electrical driven equipment and/or electrical circuits found on the appropriate one-line drawings. The Contractor shall submit this written clearing procedure to the Owner's Representative for approval.

c. The written procedures on all electrical equipment and circuits requiring electrical work shall include:

i. A positive means of isolation by providing a visible air gap on the primary isolating device or a procedure for grounding the circuit conductors.

ii. A method to verify that the associated equipment cannot be started from push button start/stop station, automatic start circuits or computer-actuated start circuits.

iii. Auxiliary circuit identification and a method for clearing auxiliary circuits unless it is impractical to clear the auxiliary circuit, then it shall be identified as energized.

iv. A positive method to verify the de-energized status of the equipment or circuit.

v. Placement of Red Danger Tags, obtaining Power Dispatcher Clearance (if required),

and issuance of an Electrical Safe Work Permit (ESWP) for equipment with operating voltage of 2300 volts and above.

d. For mechanical work on electrical driven equipment, the procedures shall include:

- i. A means of isolation such as opening disconnects.
- ii. A method to verify that the associated equipment cannot be started. Where no push button start/stop station exists, a visible air gap must be provided in the motor circuit.

iii. Placement of Red Danger Tags.

e. An ESWP shall be required for any work that may involve exposure to the de-energized conductors or circuits or equipment with operating voltages of 2300 volts or above.

The ESWP will be issued only after the equipment or circuit is de-energized, cleared and Red Danger Tags are hung. The ESWP must be posted or placed in an appropriate location as designated by the individual department.

f. Holder responsibilities:

The ESWP holder shall be an electrically qualified Dow employee approved in writing by the Department Head.

g. The Contractor Representative, who is acceptable to the Owner's Representative as responsible for performing the work, shall attach Red

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Danger Tags with the ESWP holder. After the ESWP has been issued to the holder, the Contractor Representative will assist the holder in performing voltage checks with a Bodendiek, or equivalent tester, or phase sticks, to prove the circuit is de-energized, and attach any required grounds.

h. Upon completion of the job, the Contractor Representative will remove any grounds he installed, remove his Red Danger Tag, and inform the holder that the ESWP can be released.

4. Work on or around exposed energized equipment.

a. This section governs the procedures to be used when working on or adjacent to exposed energized electrical equipment (440 volt AC or 250 volt DC or above).

b. No work on and/or adjacent to exposed electrically energized equipment will be done without a written electrical hot work procedure. The Contractor shall submit such a written procedure to the Owner's Representative for approval. Refer to Section U.6.

Adjacent to - includes work over or within possible contact with uninsulated equipment or conductors, or work where an electrical shock or flash could occur.

c. The following must be done by the electrical equipment owner before approval is granted:

i. Request that the hot work be done.

ii. Determine why the equipment or circuitry cannot be de-energized or work deferred until there is a circuit or plant outage.

iii. Investigate the job in depth, at the work site with the person performing the work, and determine that it can be done safely.

5. Operating electrical equipment.

a. This section governs the procedures and requirements for the operation of electrical equipment at the 440 volt AC, or 250 volt DC level and above.

b. Electrical equipment is defined as electrical switchgear, motor control centers, transformers, motors, circuit breakers, contactors, starters, fuses, disconnects, switches, generators, exciters, and any other associated circuit devices.

c. Electrical operating procedures will be used when operating certain electrical equipment. The Contractor shall submit such a written procedure to the Owner's Representative for approval.

d. Electrical operation shall include:

i. Opening and closing disconnects and isolation switches.

ii. Operating a start/stop control device within 10 feet of its associated switchgear.

iii. Removing or replacing electrical contactors and circuit breakers from service.

e. When personal protective flash equipment is required, it shall consist of hood complete with a neck drape, knee length jacket, and gloves as follows:

- i. Hood - Electrician/Switchman, with 20 oz. Nomex drape and multi-ply window. Encon #SD-115 or equivalent.
- ii. Jacket - Electrician/Switchman, Nomex. Large, Encon #SD-114, 48" long or equivalent.
- iii. Gloves - Best #4499 BWS or T-11 Terrycord Welder's gloves or Electrician's rubber gloves with protectors - 20 KV, 10 KV, or 750 volts as applicable, or equivalent.

f. Electrical operating procedures.

The written electrical operating procedures will direct the individual performing electrical operations, i.e., removing and/or replacing electrical equipment in service as follows:

- i. Verify the identification of equipment and its switchgear using Safety Electrical One-line Diagrams (SEOLDS).
- ii. Actuate the control switch (start/stop station), if equipped, to the "off" position and check to see that the equipment is not operating. Check for current "on" circuits through the use of amp meters, indicating lights, and breaker mechanical position indicators. If an automatic or computer-actuated start circuit exists, see that it is de-activated.

iii. Have other persons in the switch room or immediate area stand back at least 10 feet while switch gear is being operated.

iv. Use protective flash equipment if the operating mechanism or stop/start station is within 10 feet of its associated switch gear. A standby person may be necessary during the operation of the switch gear.

g. When operating switch gear:

i. Make sure the door is closed and secure and/or that the enclosure is properly secured.

ii. Stand as far as possible to one side, away from the path of the switch gear door or any exhaust vents.

iii. Turn face away from switch gear to be operated to protect from possible electrical flash.

iv. On switch gear with disconnect handles, operate the switch handle rapidly to minimize the effects of any electrical flash.

h. All motor control centers (MCCs) require flash protection.

i. Flash protection is not required for:

i. A 440 volt secondary disconnect or circuit breaker with arc quenching devices which are rated at 60 amps or less and served from a feeder that is protected by a 600 volt dual element current limiting fuse rated at 60 amps or

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less. This equipment must also be labeled "flash suit not required when operating this switch gear."

- ii. Operating the disconnect switch or welding receptacles where the procedure specifies the use of long cuff leather welding gloves, welding jacket, side shield safety glasses, and welding hood.
- iii. Any 250 volt DC rectifier control circuits protected by a 75 amp, or below, circuit breaker or fuse.

6. Job procedures

a. This section covers the requirements for preparation, approval, and use of written electrical safe job procedures. The purpose of the written electrical safe job procedure is to establish the safest and most efficient method of performing a specific electrical job in order to prevent injury or loss by recognizing, eliminating, or reducing the hazards involved.

b. Preparation - A written electrical safe job procedure shall include a scope of work statement followed by a breakdown of job steps arranged in logical sequence. Pertinent information associated with each step shall be listed and include the following essentials:

- i. Special tools, material, and safety equipment needed.
- ii. Possible known hazards.

- iii. Precautions to prevent incident, injury, or an undesirable condition. A "critical path procedure" may be in order for an unusually complicated job.

c. Use of procedure - Each job procedure will be made available to and be reviewed with each employee who will perform the work. This is necessary to familiarize them with the scope of the job and each step of the procedure. Any known hazards and precautions shall be discussed in detail.

- i. When a written electrical safe job procedure has been designated and approved as a repetitive procedure to be used on subsequent similar jobs, the familiarization review with the employees shall be repeated when the subsequent jobs are infrequent or when changes occur in personnel or job conditions.

- ii. Repetitive electrical safe job procedures shall be reviewed and updated periodically and may be used only for the duration of the permit.

V. OCCUPATIONAL HEALTH AND INDUSTRIAL HYGIENE REQUIREMENTS

1. Health and hygiene training - The Contractor shall be responsible for providing training which includes, but is not limited to the following:

- a. General training requirements under the Hazard Communication Standard 29 CFR 1910.1200 (e.g. overview of the standard and how to read an MSDS);

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b. Asbestos training required by OSHA 29 CFR 1910.1001 or OSHA 29 CFR 1926.58;

c. Respirator training required by OSHA 29 CFR 1910.134 (Respiratory Protection); and

d. Hearing conservation training required by OSHA 29 CFR 1910.95 (Occupational Noise Exposure).

2. Respirator training fit testing and medical certification

a. Escape Only Respirators

Mouthpiece respirators shall be the escape respirator of choice and shall be provided by the Contractor. If a block or area requires an escape respirator other than a mouthpiece, e.g. half-mask, etc., because of a specific need or OSHA standard, it will be the area's responsibility to provide the escape respirator for the Contractor's use while in the block unless otherwise specified in the labor service contract.

i. Fit Testing is not required.

ii. Training is the Contractor's responsibility. Documentation must be retained and Contractor records are subject to audit.

(a) Initial training must be provided (mouth piece and half-mask).

(b) Retraining is required periodically.

b. Routine, occasional or emergency work respirators

The Contractor is responsible for the required fit testing, training and medical certification for all employees who use the following types of respirators: air purifying half and full face masks, SCBA and airline systems. Documentation must be retained and Contractor records are subject to audit.

- i. Initial fit testing and training are required.
- ii. Retraining is required annually and fit testing is required every two years.
- iii. Medical certification is required initially and every two years thereafter.

c. Asbestos Respirators

- i. The Contractor is responsible for respirator fit testing.
- ii. Respirator fit testing is required every six months for personnel who use negative pressure respirators in the following situations:

(a) They are exposed to asbestos concentrations exceeding 1 f/cc for 30 minutes or 0.2 f/cc as an 8 hour TWA; or

(b) They are required to enter a regulated area where asbestos concentrations exceed or can reasonably be expected to exceed the excursion limit of 1 f/cc for 30 minutes or the PEL of 0.2 f/cc as an 8 hour TWA.

iii. Medical certification is required initially and every two years thereafter.

iv. Fit testing of half mask respirators will be conducted by either qualitative or quantitative means.

v. Documentation shall be maintained and Contractor records are subject to audit.

3. Industrial Hygiene Monitoring

All industrial hygiene personnel monitoring is the Contractor's responsibility. Documentation must be retained and Contractor records are subject to audit.

a. Asbestos

Initial monitoring is required as well as daily monitoring whenever exposures exceed the excursion limit of 1 f/cc as a 30 minute sample or the action level of 0.1 f/cc as an 8-hour TWA.

b. Noise

Monitoring is required every three years whenever the potential for exposure to noise levels of 85 dBA as an 8 hour TWA exists.

c. Specific Chemicals

Owner will monitor contractors as required by OSHA regulations or good industrial hygiene practices. Owner will document exposure monitoring results and will forward to the Contractor for retention.

ST0401906

4. Medical Surveillance

Where applicable, Owner, in the interest of individual health and safety, will perform medical surveillance on Contractor employees without charge. The purpose of such surveillance is to establish a medical data base and to determine the highest practicable goals for maintaining a healthy work environment. Said medical surveillance will be conducted by medical personnel designated by Owner.

V

ST0401907

RR

ST0401907

W. FORMS

<u>FORM TITLE</u>	<u>PAGE</u>
Bucket Truck Inspection	90
Contractor Accident - Incident Report	91
Crane Safe Work Permit	92
Equipment Decal	93
Flex Lift Inspection	94
Hoisting Equipment Inspection Report	95
Hydraulic Crane Inspection Report	96
Hydroblasting Pre-job Checklist	97
Operator's Daily Inspection - Aerial Lift Daily Checklist	98
Flex Lift Daily Inspection	99
Lift Truck Daily Inspection	100
Mobile Crane	101
Personnel Aerial Lifting Equipment Inspection	102
Personnel Platform Lifting Checklist	103 & 104
Polecat Truck Inspection	105
Pre-job Safety Checklist	106 & 107
Radiography Safe Work Permit	108

BUCKET TRUCK INSPECTION



DATE: _____

OWNER: _____ EQUIPMENT NO.: _____

MANUFACTURER/MODEL _____

CONDITION

1. DRIVER SYSTEM - (truck) _____
2. STEERING SYSTEM - (truck) _____
3. TIRES - condition, inflation, nuts _____
4. BRAKES _____
5. LIGHTS _____
6. EXHAUST SYSTEM _____
7. HYDRAULIC OUTRIGGERS _____
8. TUMPTABLE - condition _____
9. BOOM SECTION - base, lift cylinder
1st. & 2nd. Section, Pins _____
10. BUCKET ASSEMBLY - condition _____
11. WARNING & CAUTION PLACARDS _____
12. FIRE EXTINGUISHER _____
13. LOWER CONTROLS - operatable, labeled _____
14. BUCKET CONTROLS - operatable, labeled _____
15. DEAD MAN SWITCHES - operatable _____
16. EMERGENCY LOWERING - bleedout, placards, operatable _____
17. CYLINDER HOLDING VALVES _____
18. HYDRAULIC SYSTEM - hoses, pumps, controls _____
19. HOUSE KEEPING _____
20. LAST DATE ELECTRICAL TEST ON BOOM _____
21. CURRENT STATE INSPECTION STICKER _____

OVERALL EVALUATION OF CONDITION - ☐ SAFE ☐ UNSAFE

INSPECTOR (OWNER) _____ TAG NO.: _____

AUDITED BY (DOH) _____ DATE: _____

COMMENTS: _____

CEW/bw

W

ST0401909

ST0401910

CONTRACTOR ACCIDENT-INCIDENT REPORT

This report may be used as a notice of accident/incident or as a follow-up investigation report. It must be completed and filed with the Bureau of Occupational Safety and Health (BOS) within 30 days of the accident/incident.

GENERAL INFORMATION				CHECK ONE			
DATE OF INCIDENT				TYPE OF INCIDENT			
TIME OF INCIDENT				LOCATION			
P. D. NO.				NAME OF INJURED			
CONTRACTOR COMPANY				SUB-CONTRACTOR			
EXTENT OF INJURY				INCIDENT INVESTIGATION BY			
DESCRIPTION OF INCIDENT				NAME NO.			
				P.O. NO.			
				OBSA			
				DWP			

This report is made to indicate the cause of an accident/incident and determine any corrective action which will help prevent future accidents/incidents. Be sure to determine that it is done properly.

CAUSES OF THE INCIDENT

CLASSIFY CAUSE OF INCIDENT (CHECK ONE OR MORE)

TYPE OF INJURY	CAUSE OF INJURY	DEFECTIVE TOOL	SAFETY HAZ. W/O.
LOOSE LIFTING	LOOSE PROCEDURE	DEFECTIVE EQUIP.	SAFETY HAZ. W/O.
LOOSE LIFTING	COMMUNICATIONS	DEFECTIVE EQUIP.	SAFETY HAZ. W/O.
LOOSE LIFTING	HOVERING	DEFECTIVE EQUIP.	SAFETY HAZ. W/O.

CONSTRUCTIVE ACTION TAKEN

TO BE COMPLETED BY

INVESTIGATION ATTENDANCE LIST TO INDICATE PERSON RESPONSIBLE FOR FOLLOW-UP

THIS SECTION TO BE COMPLETED FOR NOTICE OF ACCIDENT-INCIDENT REPORTS ONLY

PERSONNEL	COMPANY	DATE	OWNER REPRESENTATIVE	DATE
GENERAL CONTRACTOR SURV.	COMPANY	DATE	OWNER SURV.	DATE

SAFETY STANDARD NO. 88-72
ATTACHMENT A

OWNER

92

ST0401912

Date _____		Serial No A- 0055
Manufacturer _____		
Owner _____		
Inspector _____		
Auditor _____		
The affixing of this acceptance does not, in any way, relieve, change, alter or diminish any liability, responsibility or obligation assumed by Contractor under any contract or agreement with Dow.		

FLUX LIFT INSPECTION

OWNER _____ DATE _____ EQUIPMENT NO. _____

MANUFACTURER/MODEL _____

SERIAL NO. _____ MAXIMUM CAPACITY _____

BOOM LENGTH AT MAXIMUM LIFT CAPACITY _____

CAPACITY CHART POSTED IN CAB () YES () NO

	CONDITION
1. DRIVER SYSTEM TRUCK	_____
2. STEERING SYSTEM - TRUCK	_____
3. TIRES - CONDITION, INFLATION, NUTS	_____
4. BRAKES	_____
5. LIGHTS	_____
6. EXHAUST SYSTEM	_____
7. IDENTIFICATION & HIGH VISIBILITY MARKING	_____
8. HOORS - SHIELD, SAFETY LATCH, CONDITION	_____
9. HYDRAULIC OVERTRIGGERS	_____
10. CABLE DRUM - FACING & BECKET	_____
11. HOIST LINE - CONDITION	_____
12. MAIN BOOM - BASE LIFT, CYLINDER PINS, HOLDING VALVE	_____
13. CABLE GUIDE	_____
14. HYDRAULIC SYSTEM - HOSES, PUMP	_____
15. CONTROLS - OPERABLE, LABELED	_____
16. FIRE EXTINGUISHER	_____
17. HOUSE KEEPING	_____
18. CURRENT STATE INSPECTION STICKER	_____

OVERALL EVALUATION OF CONDITION: () GOOD, SAFE () FAIR, SAFE () UNSAFE

INSPECTOR (OWNER) _____

ADDED BY (DOB) _____

TAG NO. _____ DATE: _____

COMMENTS: _____

DEF/204

ST0401913



HOISTING EQUIPMENT INSPECTION REPORT

(Use Hydraulic Crane Inspection Form for Hydraulic Cranes)

OWNER _____ DATE _____ EQUIPMENT NO. _____
MANUFACTURER/MODEL _____
MAXIMUM CAPACITY _____
SERIAL NO. _____
DATE OF MANUFACTURE _____
COUNTERWEIGHT FOR NORMAL USE _____
BOOM LENGTH FOR NORMAL USE _____
COUNTERWEIGHT FOR CAPACITY LIFT _____
BOOM LENGTH FOR CAPACITY LIFT _____
CAPACITY CHART POSTED IN CAB () YES () NO

CONDITION

1 Identification & high-visibility markings _____
2 Hooks (pins, rivets) _____
3 Boom sheaves & blocks (straps) _____
4 Traveling block (pins, grease fittings) _____
5 Cable drums (facing & bechert) _____
6 Hoist lock (lock on brakes) _____
7 Clutches (bands, pins & roller pins) _____
8 Whip line (condition of cable, age) _____
9 Load line (condition of cable, age) _____
10 Boom line (condition of cable, age) _____
11 Boom & jib pendants (condition of cable sockets, age) _____
12 Main boom (structural members, pins) _____
13 Jib structure (members, pins) _____
14 Gantry (A-frame) (pins, sheaves, straps) _____
15 Swing lock _____
16 Hydraulic or air system _____
17 Lighting system _____
18 Parking _____
19 Drive chain (tension) _____
20 Tires (air pressure, damage) _____
21 Steering mechanism _____
22 Counterweights (adequate or not) _____
23 Cable platform handling steps, grab, etc. (access) _____
24 Fire extinguisher _____
25 Boom limit safety device _____
26 Power lowering - whip line _____
27 Power lowering - load line _____
28 Boom lower pins _____
29 Maintenance _____
OVERALL EVALUATION OF CONDITION: () Good, Safe () Fair, Safe () Unsafe

Inspector (Name) _____
Audited by (Date) _____
Tag No. _____ Date _____

ST0401914



HYDRAULIC CRANE INSPECTION REPORT

OWNER _____ DATE _____ EQUIPMENT NO. _____

MANUFACTURER/MODEL _____

SERIAL NO. _____

DATE OF MANUFACTURE _____

MAXIMUM CAPACITY _____

BOOM LENGTH AT MAXIMUM LIFT CAPACITY _____

CAPACITY CHART POSTED IN CAB () YES () NO

	CONDITION
1. Load Rating & high-velocity markings	_____
2. Hooks (pins-rollers)	_____
3. Hook block (pins-grapes-ropes)	_____
4. Boom tip sheaves	_____
5. Cable from hoisting & bracing	_____
6. Main line (condition of cable, rope)	_____
7. Main beam (shear-lane members-joints)	_____
8. Boom & members (structural members-joints)	_____
9. Cable rollers	_____
10. Boom hook safety device (shear pins)	_____
11. Hydraulic system (hoses, pumps, controls, reservoir)	_____
12. Hydraulic couplings	_____
13. Power unit instrumentation	_____
14. Tires (air pressure-damage)	_____
15. Steering mechanism	_____
16. Cuts, fractures, non-drifting, shear pins etc. (suspension)	_____
17. Lighting system	_____
18. Fencing	_____
19. Fire extinguisher	_____
20. Housekeeping	_____

OVERALL EVALUATION OF CONDITION: () Good, Safe () Fair, Safe () Unsafe

COMMENTS _____

Inspector (Signature) _____

Audited by (Date) _____

Tag No. _____ Date _____

ST0401915



SAFETY STANDARD NO. 64-83
ATTACHMENT A

HYDROBLASTING PRE-JOB CHECKLIST

THE HYDROBLASTING CREW SUPERVISOR OR CREW LEADER AND THE DOW REPRESENTATIVE SHALL COMPLETE A PRE-JOB CHECKLIST AND SIGN IT PRIOR TO COMMENCING THE JOB. IF ALL ITEMS ON THE CHECKLIST HAVE NOT BEEN COMPLETED IN THE "YES" COLUMN OR MARKED N/A (NOT APPLICABLE), THE JOB WILL NOT BE COMMENCED. THIS CHECKLIST WILL BE MAINTAINED BY THE HYDROBLAST CREW AT THE JOB SITE.

	YES	NO	N/A
1. Has the location of the nearest safety shower and eyewash station been pointed out to all members of party?			
2. Is the hydroblast area taped off and/or warning signs in place?			
3. Is the work area clear of tripping hazards and falling equipment hazards?			
4. Should the pump head fail, will its path be clear?			
5. Is the area safe from hazardous chemicals, odors, vapors, liquids or solids?			
6. Does each member of the work party understand the chemical and mechanical hazards particular to this job and have hard hat, face shield, ear protection, safety glasses, respirator available, and hard soled rubber boots?			
7. Has protection been taken against flying particles?			
8. Have precautions been taken to prevent excessive backward thrust?			
9. Have precautions been taken to protect electrical equipment from water?			
10. Has pressure been removed from the shell side of exchangers to be cleaned? If not, have hazards been evaluated?			
11. Is equipment properly grounded?			
12. Have precautions been taken to prevent line mole reversal?			
13. If scaffolding is required, is it adequate?			
14. Has a non-slip surface been considered?			
AT THIS TIME HYDROBLAST SYSTEM WILL BE PRESSURIZED			
15. Have all fittings and hoses been visually checked for leaks?			
16. Has bypass been inspected and tagged accordingly within the last six (6) months?			
17. Is the control valve working properly? (Deadman switch)?			
18. Has a Safe Work Permit been issued?			

SIGNATURE OF HYDROBLASTING CREW SUPERVISOR OR CREW LEADER _____

SIGNATURE OF DOW REPRESENTATIVE _____

REVISIONS DOW CHECK 64-83B-83B BY TACH

OWNER

NAME: _____

DATE: _____

DAILY PERFORMANCE TEST CHECK LIST
FOR AERIAL LIFTS

1. Visually inspect for:
 - a. Hydraulic leaks. ()
 - b. Loose objects or damage to basket or structure. ()
2. Check fuel supply. ()
3. Inspect tires. ()
4. Check engine oil level. ()
5. Check battery water. ()
6. Check ground controls both emergency and with engine running. ()
7. Check for safety equipment in basket:
 - a. Respirator on person. ()
 - b. Eye wash bottle. ()
 - c. Fire Extinguisher. ()
8. Check brake operation (brakes engage when drive lever is in neutral position). ()
9. All switch and control name decals legible. ()
10. Check each function:
 - a. Lift up. ()
 - b. Lift down. ()
 - c. Swing right. ()
 - d. Swing left. ()
 - e. Telescope in. ()
 - f. Telescope out. ()
 - g. Platform lever up. ()
 - h. Platform lever down. ()
 - i. Drive forward. ()
 - j. Drive reverse. ()
 - k. Steer right. ()
 - l. Steer left. ()
 - m. Check operation of platform controls on emergency power. ()
11. Grease the following three pivot points:
 - a. Basket pivot. ()
 - b. Main boom pivot. ()
 - c. Lift cylinder pivot. ()

Notify Supervision If Any Defect Or Malfunction Is Found.

Check List Will Be Returned To Immediate Supervision

Date _____

Operator _____

4/11/89/bt
8:114

ST0401917

ST0401918

OPERATOR'S DAILY INSPECTION
FLEX LIFT OPERATION

UNIT _____ DATE _____

	ACCEPTABLE	NOT ACCEPTABLE	NOT ACCEPTABLE
1. Load line (lubricated, wound properly on drum, condition)	_____	_____	_____
2. Hook and safety latches on load block	_____	_____	_____
3. Cable at wear points	_____	_____	_____
4. Wedges installed	_____	_____	_____
5. Clamps on dead ends	_____	_____	_____
6. Drum, condition	_____	_____	_____
7. Hydraulic oil lines	_____	_____	_____
8. Outriggers, outrigger pads and pins	_____	_____	_____
9. Lights, turn signals	_____	_____	_____
10. Horn	_____	_____	_____
11. Oil	_____	_____	_____
12. Water	_____	_____	_____
13. Boom pins	_____	_____	_____
14. Catter pins	_____	_____	_____
15. Steering	_____	_____	_____
16. Tires	_____	_____	_____
17. Controls	_____	_____	_____
18. Brakes (swing winch, etc., operate against engine power)	_____	_____	_____
19. Instruments	_____	_____	_____
20. Legible load chart	_____	_____	_____
21. Clean windshield, windows, check wipers	_____	_____	_____
22. P.T.O. engaged light	_____	_____	_____
23. Boom cradle tight	_____	_____	_____

COMMENTS: _____

RIG OPERATOR: _____
2/14/89/bl

LIFT TRUCK OPERATOR'S
DAILY CHECK LIST

TRUCK NO. _____ OPERATOR _____

TRUCK MODEL _____ DEPT. _____

DATE _____ SHIFT _____ HOUR METER _____

- _____ PLUG BATTERY INTO TRUCK, IF NOT ALREADY DONE (ELEC.)
- _____ TEST LIFT AND FULT CONTROLS
- _____ CHECK DIE (GAS OR LPG)
- _____ CHECK SPEED CONTROLS FOR STICKING OR ERRATIC OPERATION
- _____ CHECK FUEL GAUGE (GAS)
- _____ CHECK AROUND TRUCK FOR OBVIOUS LEAKS
- _____ CHECK HORN
- _____ CHECK BRAKES (INCLUDING PARKING BRAKE)
- _____ CHECK STEERING
- _____ CHECK TIRES FOR DEFECTS, CUTS OR IMBEDDED OBJECTS
- _____ CHECK FOR UNUSUAL NOISES WHEN TRUCK IS RUNNING
- _____ CHECK FOR OIL LEAKS
- _____ CHECK LIGHTS
- _____ CHECK 6 MONTH STICKER VALIDITY

REPORT ANY AND ALL DEFECTS TO SUPERVISOR IMMEDIATELY

2/28/89/81

ST0401919

02610401S



OPERATOR'S DAILY INSPECTION - MOBILE CRANE OPERATION

DAILY CHECK LIST ON EQUIPMENT _____ DATE _____
MAKE OF EQUIPMENT _____ MODEL NO. _____
WEIGHT _____ LIFTING CAPACITY _____
EXPIRATION MONTH OF INSPECTION _____

	ACCEPT- ABLE	NOT ACCEPT- ABLE	NOT APPLIC- ABLE
1. LOAD LINE (LUBRICATED, WOUND PROPERLY ON DRUM, CONDITION)	_____	_____	_____
2. WHIP LINE (LUBRICATED, WOUND PROPERLY ON DRUM, CONDITION)	_____	_____	_____
3. HOOK AND SAFETY LATCHES ON LOAD BLOCK	_____	_____	_____
4. HOOK AND SAFETY LATCHES ON HEADACHE BALL	_____	_____	_____
5. CABLE AT WIND PORTS	_____	_____	_____
6. PINS IN SOCKET	_____	_____	_____
7. WEDGES INSTALLED	_____	_____	_____
8. CLAMPS ON DEAD ENDS	_____	_____	_____
9. HOIST LINE (CONVENTIONAL, SCORERS) (LUBRICATED, WOUND PROPERLY ON DRUM, CONDITION)	_____	_____	_____
10. HYDRAULIC OIL LINES	_____	_____	_____
11. OUTRIGGERS, OUTRIGGER PADS AND PINS	_____	_____	_____
12. LIGHTS TURN SIGNALS	_____	_____	_____
13. HORN	_____	_____	_____
14. OIL	_____	_____	_____
15. WATER	_____	_____	_____
16. ROAD PINS	_____	_____	_____
17. COTTER PINS	_____	_____	_____
18. STEERING	_____	_____	_____
19. TIRES	_____	_____	_____
20. CONTROLS (CHECK OPERATION)	_____	_____	_____
21. BRAKES (BRAKE WHICH ETC. OPERATE AGAINST ENGINE POWER)	_____	_____	_____
22. INSTRUMENTS	_____	_____	_____
23. LEADERS LEAD CRANES	_____	_____	_____
24. CLEAN WINDSHIELD, WINDOWS, CHECK WIPERS	_____	_____	_____
HIG OPERATOR _____			

PERSONNEL AERIAL LIFTING EQUIPMENT INSPECTION

OWNER: _____ DATE: _____
 MANUFACTURER/MODEL: _____ EQUIPMENT NO.: _____

	CONDITION
1. DRIVE SYSTEM (MOTOR, ARROWS, PLANETARY DRIVE SHAFTS)	_____
2. STEERING SYSTEM (ROD END, SPINDLE ASSEMBLY, STEERING CYLINDERS)	_____
3. TIRES (WEAR, CUTS, INFLATION, LUG NUTS)	_____
4. BOWES (HOLDING, RELEASE, LEAKS)	_____
5. TURNABLE (GEAR, BEARING, MOUNTING BOLTS)	_____
6. ENGINE COMPARTMENT (CONDITIONS, LEAKS, OIL LEVEL)	_____
7. EXHAUST SYSTEM	_____
8. BOOM SECTION (BASE, MID & FLY SECTION, ANCHOR PINS, DRIVE CHAIN, LIFT CYLINDER, TELESCOPE CYLINDER LOCKING PIN)	_____
9. PLATFORM ASSEMBLY (SLIP PLATE OR MESH, FLOOR, DOOR & LATCH, LEVELING)	_____
10. WARNING SIGNALS (HIGH VOLTAGE, CAP.)	_____
11. LIFT MOVING SIGNALS (FRONT & REAR)	_____
12. GROUND CONTROLS (LABELLED & OPERABLE)	_____
13. PLATFORM CONTROLS (LABELLED & OPERABLE)	_____
14. ELECTRICAL & MANUAL EMERGENCY RETRACTION & LOWERING (LABELLED & OPERABLE)	_____
15. AUTOMATIC LIMIT SWITCH	_____
16. HYDRAULIC SYSTEM	_____
17. COUNTER BALANCE	_____
18. HOUSE KEEPING	_____
19. DEAD MAN CONTROLS (OPERABLE)	_____
OVERALL CONDITION: GOOD _____ FAIR _____ UNSAFE _____	
COMMENTS _____	

ST0401921

INSPECTOR (OWNER) _____
 AUDITED BY (BOA) _____
 TAG NO. _____ DATE: _____

PERSONNEL PLATFORM LIFTING CHECKLIST

CONSIDERATIONS MUST BE GIVEN TO OTHER MEANS OF GETTING THE JOB DONE AND DECISIONS SHALL BE FOR THE SAFEST METHOD AVAILABLE WITH THE LEAST EXPOSURE TO THE SMALLEST NUMBER OF PEOPLE.

THIS CHECKLIST MUST BE COMPLETED PRIOR TO EACH JOB REQUIRING LIFTING OF PERSONNEL. THE SAFE WORK PERMIT MUST BE RENEWED IF JOB SCOPE, CONDITIONS, PERSONNEL, OR EQUIPMENT CHANGE. THE LIFT MUST NOT BE MADE UNTIL ALL QUESTIONS CAN BE ANSWERED "YES".

YES

1. Have all chemical, electrical, fire, or temperature hazards been considered? ☐
2. Are personnel wearing the required safety equipment to do the job? ☐
3. Has the anti-two block system been tested and found to be operable prior to this job? ☐
4. Has the crane been visually inspected for safety and does it have a current inspection tag? ☐
Crane tag date _____
5. Is the load to be lifted on the platform within the load capacity of the personnel platform? ☐
6. Are the lifting cables in good condition? ☐
7. Is the cable wound on the drum correctly and smoothly? ☐
8. Is the cable running free and not fouled? ☐
9. Are the wedges, becket, and cable clamps in good condition and secured? ☐
10. Is the crane on solid foundation and/or mats? ☐
11. Are the outriggers extended and the crane level? ☐
12. Is the safety lock on the hook in good condition? ☐
13. Do flag persons and operator understand hand signals? ☐
14. Are personnel in the platform wearing fall protection? ☐
15. Has the operator been instructed to remain at the crane controls while the personnel are in the platform? ☐
16. If it is necessary to telescope the boom while hoisting personnel, have precautions been taken to prevent two-blocking? ☐

17. Have calculations been made to assure that the load does not exceed 50% of the crane capacity while hoisting personnel? _____
18. Is the work platform properly secured to the load line? _____
19. Has the work platform been load tested prior to hoisting personnel? _____
20. Has a trial lift and 125% proof test been made prior to hoisting personnel? _____
21. Has an observer been selected to observe for proper cable wrapping during the lift?
Observer's Name _____
22. Will the crane operator, flag person and/or personnel being lifted be able to maintain visual or verbal contact? _____
23. Has a Crane Safe Work Permit been issued for the job? _____

Crane Operator	Owner's Representative or Permit Writer	Personnel Hoisted
----------------	--	-------------------

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ST0401923

ST0401924



POLECAT TRUCK INSPECTION

OWNER _____ DATE _____ EQUIPMENT NO. _____

MANUFACTURER/MODEL _____

SERIAL NO. _____ MAXIMUM CAPACITY _____

BOOM LENGTH AT MAXIMUM LIFT CAPACITY _____

CAPACITY CHART POSTED IN CAB () YES () NO

	CONDITION
1. DRIVER SEAT/STEERING TRUCK	_____
2. STEERING SYSTEM - TRUCK	_____
3. TIRES - CONDITION, INFLATION, NUTS	_____
4. BRAKES	_____
5. LIGHTS	_____
6. EXHAUST SYSTEM	_____
7. IDENTIFICATION & HIGH VISIBILITY MARKING	_____
8. HOOKS - SWIVEL, SAFETY LATCH, CONDITION	_____
9. HYDRAULIC CUTGRASSERS	_____
10. CABLE DRUM - FACING & BECKET	_____
11. HOIST LINE - CONDITION	_____
12. MAIN BOOM - BASE, LIFT, CYLINDER PINS, HOLDING, VALVE	_____
13. CABLE GUIDE	_____
14. HYDRAULIC SYSTEM - HOSES, PUMP	_____
15. CONTROLS - OPERATABLE, LABELED	_____
16. FIRE EXTINGUISHER	_____
17. HOUSE KEEPING	_____
18. CURRENT STATE INSPECTION STICKER	_____

OVERALL EVALUATION OF CONDITION. () GOOD, SAFE () FAIR, SAFE () UNSAFE

INSPECTOR (OWNER) _____

AUDITED BY (DOM) _____ DATE _____

TAG NO. _____

COMMENTS: _____

CEN/BN

[illegible]

ST0401925

ST0401926

PROJECT SAFETY CHECK SHEET

PROJECT C.D. NUMBER _____ CONTRACTOR _____

SUB-CONTRACTORS _____

1. Do you have a copy of the approved SAFETY & LOSS PREVENTION PLAN (S&LPP) FOR CONTRACTORS? Are your sub-contractors aware of this plan and its contents?		Yes	N/A
2. EMERGENCY PLAN	2.1 Standard emergency response plan implemented?	Yes	N/A
	2.2 Control of responsibility in case of emergency understood?	Yes	N/A
	2.3 First aid and resuscitation facilities available?	Yes	N/A
	2.4 Location of assembly point for evacuation?	Yes	N/A
	2.5 Safety shower and eye wash facilities known?	Yes	N/A
3. PROTECTIVE MEASURES	3.1 Access for protection equipment management?	Yes	N/A
	3.2 First aid and resuscitation facilities and other works for protection of equipment management?	Yes	N/A
	3.3 Report of all damage to safety barriers for work performed with Manufacturing Equipment?	Yes	N/A
	3.4 Special safety rules and signs for work in progress?	Yes	N/A
	3.5 Check and identify safety signs and other safety signs?	Yes	N/A
4. PERSONNEL	4.1 Special safety rules and signs for work in progress?	Yes	N/A
	4.2 Location of all safety signs and other safety signs?	Yes	N/A
	4.3 Report of all damage to safety barriers for work performed with Manufacturing Equipment?	Yes	N/A
	4.4 Special safety rules and signs for work in progress?	Yes	N/A
	4.5 Check and identify safety signs and other safety signs?	Yes	N/A
5. EQUIPMENT	5.1 Special safety rules and signs for work in progress?	Yes	N/A
	5.2 Location of all safety signs and other safety signs?	Yes	N/A
	5.3 Report of all damage to safety barriers for work performed with Manufacturing Equipment?	Yes	N/A
	5.4 Special safety rules and signs for work in progress?	Yes	N/A
	5.5 Check and identify safety signs and other safety signs?	Yes	N/A
6. MATERIALS	6.1 Special safety rules and signs for work in progress?	Yes	N/A
	6.2 Location of all safety signs and other safety signs?	Yes	N/A
	6.3 Report of all damage to safety barriers for work performed with Manufacturing Equipment?	Yes	N/A
	6.4 Special safety rules and signs for work in progress?	Yes	N/A
	6.5 Check and identify safety signs and other safety signs?	Yes	N/A
7. PROTECTIVE MEASURES	7.1 Special safety rules and signs for work in progress?	Yes	N/A
	7.2 Location of all safety signs and other safety signs?	Yes	N/A
	7.3 Report of all damage to safety barriers for work performed with Manufacturing Equipment?	Yes	N/A
	7.4 Special safety rules and signs for work in progress?	Yes	N/A
	7.5 Check and identify safety signs and other safety signs?	Yes	N/A
8. PERSONNEL	8.1 Special safety rules and signs for work in progress?	Yes	N/A
	8.2 Location of all safety signs and other safety signs?	Yes	N/A
	8.3 Report of all damage to safety barriers for work performed with Manufacturing Equipment?	Yes	N/A
	8.4 Special safety rules and signs for work in progress?	Yes	N/A
	8.5 Check and identify safety signs and other safety signs?	Yes	N/A
9. EQUIPMENT	9.1 Special safety rules and signs for work in progress?	Yes	N/A
	9.2 Location of all safety signs and other safety signs?	Yes	N/A
	9.3 Report of all damage to safety barriers for work performed with Manufacturing Equipment?	Yes	N/A
	9.4 Special safety rules and signs for work in progress?	Yes	N/A
	9.5 Check and identify safety signs and other safety signs?	Yes	N/A
10. MATERIALS	10.1 Special safety rules and signs for work in progress?	Yes	N/A
	10.2 Location of all safety signs and other safety signs?	Yes	N/A
	10.3 Report of all damage to safety barriers for work performed with Manufacturing Equipment?	Yes	N/A
	10.4 Special safety rules and signs for work in progress?	Yes	N/A
	10.5 Check and identify safety signs and other safety signs?	Yes	N/A

RADIOGRAPHY **SAFE WORK PERMIT**

Form 1 - IT MUST BE APPROVED BEFORE WORK MAY BEGIN DATE _____

1. DOWNSHAFT/STATION/ROOM
2. Power Chambers (press. Air)
3. Fire Exting. (in case)
2. SURVEY METERS
Calibrating and certified within 180 days
3. AREA BOSTONED
Boundary limits estimated if 2nd case approved
4. SUFFICIENT ROPE, LIFELINES, HELPERS ETC. AVAILABLE TO CONTROL THE AREA
5. RADIOGRAPHER APPROVED AND QUALIFIED TO WORK ON DON LOCATION
Name _____
Certification Card No. _____ Dosimeter reading before _____
6. HELPER (A) APPROVED TO WORK ON A DON LOCATION
Name _____
Certification Card No. _____ Dosimeter reading before _____
7. HELPER (B) APPROVED TO WORK ON A DON LOCATION
Name _____
Certification Card No. _____ Dosimeter reading before _____
8. INVOLVED PERSONNEL NOTIFIED (ADJACENT WORK CREWS, ETC.)
Operations personnel must be notified for possible backstopping of radiation detection services.
9. CONTROLLED AREA HAS BEEN SECURED BEFORE RADIOGRAPHY STARTS
10. 2 - SURVEY METERS
A. One near station
B. One in Radioisotope protective barrier
11. SIGNATURE OF PERSON ISSUING THIS SAFE WORK PERMIT _____
Name _____ Date _____ Received By _____
12. JOB COMPLETE
A. Signs verified correct in camera
B. Signs, signs, etc. removed
C. Incident preserved (Item B) informed and clear
D. Return work permit
E. Actual backstopping indicator lamp - measured with meter on _____
F. Dosimeter readings after job complete
Radioisotope _____ Helper A _____
Helper B _____

NOTE: This form (if form completed) is to be returned with the processed radiographic film.

ST0401927

INDEX

TITLE	SECTION	PAGE
Abrasive Blasting	T	73
Accident/Incident Notification	B-8	9
Air Compressors, breathing	D-13	12
Air Hoods	D-13	12
Alcohol	C-13	10
Ambulance, Call requirements	B-4	8
Asbestos	S	73
Assured Equipment		
Ground Conductor Program	H-16	36
Barricades and Guards	M	62
Batteries, Jump Starting	E-11	15
Blue Flags, Lights	O	64
Body Belt, Class I	L-3	59
Body Harness, Class III	L-2	59
Bridge Capacity	E-19	16
Buses, Passing	E-3	14
Chemical Exposure	B-3	8
Compressed Air, Cleaning With	C-7	9
Crane Safe Work Permit	H-7	26
Cranes	E-20,21, 22	17
	H-3,5,8, 9,10,15	23-36
Critical Lift	H-8	26
Cylinders, Gas/oxygen	G-8	22
Deadman Control	H-19	38
Defective Tools	H-1	23
Demolition	Q	68
Derails, Railroad	O	64
Discharged Employees	A-2	5
Drugs	C-13	10
Electrical Safe Work Permit	U-3	78
Electrical Tools and Equipment, Greater than 32 volts	H-18	38

INDEX

TITLE	SECTION	PAGE
Electrical Work	U	74
Emergency Horn Testing		5
Emergency Procedure		3
Emergency Signals		3
Equipment Inspection	H-5	25
Evacuation		5
Excavations	N	64
Exceptions, rules	Introduction	2
Eyewash Procedure	B-2	8
Face Shield	D-7	11
Fall Restraint Systems	L	58
Fire Protection	G	20
Fire Reporting	B-6	8
Firearms	C-13	10
Forms	W	89
Fuel Containers	G-6,7	21 & 22
Goggles, Chemical	D-5,6,7 & E-11	11 & 15
Goggles, Welding	D-10	12
Grinders	H-22,23, 24	39
Ground Fault Circuit Interrupter (GFCI)	H-46	36
Guarding Equipment	H-2	23
Harness, Safety	D-17	13
Hats, Safety	D-9	12
Hazardous Materials, Spills	C-8	10
Hazardous Materials, Emergency Guide	Inside Back Cover	
Health and Hygiene Training	V	84
Hearing Protectors	D-18	13
High Voltage, Working near	H-15	35
Horseplay	C-2	9
Hose Connectors/adaptors	H-25	39

ST0401929

ST0401930

INDEX

TITLE	SECTION	PAGE
Hydroblasting	R	69
Individual Action	C	9
Indoctrination, Orientation	A-4	6
Injuries - Incidents	B	7
Injury - Incident, notification	B-5,7,8,C-1	8,9
Inspections, Contractor Work	A-6	7
Knives, Fixed Blade	H-27	40
Ladders	I-1,2,3	40
Lanyard, Safety	L-5	59
Life Jackets	D-17	13
Lift Truck	H-3,4,5	24
Lighting, working in vessel	H-20	38
Loads, Width/weight	E-15,16, 17,19	15,16
Medical Surveillance/Exams	V-4	88
Metatarsal Guards	D-16	13
Monitoring, Industrial Hygiene	V-3	87
Motor Vehicle Accidents	E-2	14
Motor Vehicle, Gas Release		4
Non-English speaking employees	A-9	7
Operator Qualifications	H-3,4	23
Overtime Work	A-10	7
Owner, Owner's Representative	Introduction	2
Personal Protective Clothing & Equipment	D-1,2,14 & H-24	10-13&39
Personnel Lifting Device	H-3,4,5,15	23-25,35
Personnel Lifting Platform	H-11,12,13, 14	29
Personnel Lifting, Cranes	H-10	27
Portable Buildings	F	17
Powder-actuated Fastening Guns	H-26	40

INDEX

TITLE	SECTION	PAGE
Pre-job Safety Conference	A-3	6
Pressure Vessels	H-17	36
Radiography	P	66
Red Danger Tags	J	50
Refueling Engines	E-9,10	15
Respirator Training, Fit Testing & Medical Certification	V	85
Respirators	D-11,12	12
Responsibility for Safety	A	5
Rings, Jewelry, Clothing, & Hair	C-10,11	10
Roofing Work, Fall Protection	L-10	60
Safe Work Permits	K	55
Safety Glasses	D-4	11
Safety Programs, Contractor	A-1	5
Safety Shoes	D-15	13
Safety Shower	A-5	7
Scaffolds	I-5,6,7,8, 9,10	42
Seat Belts	E-12	15
Shortcuts	C-3	9
Smoking	C-12	10
Speed Limit	E-7	14
Trailer Hitches	E-14	15
Unattended Vehicle	E-8	15
Vacuum Trucks	E-18	16
Vehicles & Traffic	E	14
Walking Pipelines/Cabletrays	C-3	9
Welding/Cutting	G-1,2,3, 4,5,H-21	20 38-39

ST0401931

NOTES

ST0401932

ST0401932

NOTES

ST0401933

ST0401933

NOTES

ST0401934

ST0401934

ST0401935

Emergency Guide For Hazardous Material

