

SAFETY AND LOSS PREVENTION MANUAL FOR CONTRACTORS

FOR USE ON ALL CONTRACTED WORK
IN THE TEXAS DIVISION



AMBULANCE
FIRE
ACCIDENTS
EMERGENCIES



DIAL

666

THE DOW CHEMICAL COMPANY
Corporate Engineering & Construction Services

*February, 1967

SAFETY AND LOSS PREVENTION MANUAL FOR CONTRACTORS

**FOR USE ON ALL CONTRACTED WORK
IN THE TEXAS DIVISION**

*It is the objective of Corporate Engineering and Construction Services to Establish and maintain an active, successful accident prevention program that will ultimately result in top safety performance by contractors doing work for the Dow Chemical Company

THE DOW CHEMICAL COMPANY

Corporate Engineering & Construction Services

***February, 1967**

(Supersedes Safety Manual for Contractors
dated July, 1965)

INDEX

SAFETY RULE	PAGE
Introduction	1
1. General Safety Rules.....	2
2. Emergency Procedure.....	5
3. First Aid-Injuries-Reports.....	6
4. Individual Action.....	9
5. Vehicles and Traffic.....	10
6. Protective Equipment and Clothing.....	13
7. Fire Protection.....	15
8. Machinery, Cranes, Tools and Equipment....	17
9. Ladders and Scaffolds.....	26
10. Danger, Warning & Caution Tags.....	31
11. Safe Work Permits.....	35
12. Excavations, Floor Openings, Barricades....	37
13. Radiation.....	38
14. Demolition.....	39

INTRODUCTION

This safety manual contains the minimum safety rules and procedures for performance of work by contractors and their subcontractors as required by the Texas Division, The Dow Chemical Company. 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. The Dow Chemical Company is hereinafter referred to as "Owner." The Owner will be represented on construction as defined in the contract and hereinafter referred to as "Owner's Representative."

Safety rules and procedures are an integral part of each contract and must be carried out fully, as any other specification for the job. The contractor will be held responsible for his subcontractors conforming with these safety rules and procedures. Any exception to the rules set forth herein must have prior written authorization from the Owner's Representative.

Contractors and contractor supervision unable or unwilling to secure personnel performance in keeping with these rules will not be acceptable. Contractor employees who exhibit a poor attitude toward safe work and safety procedures will not be acceptable. Employees leaving a job due to safety violations will not be allowed to return to any Owner's work without proper authorization from the Owner. The contractor's safety record will be one criteria used to judge his 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 federal, state or local laws governing.

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

GENERAL SAFETY RULES

1 The contractor shall actively and adequately provide working performances on the part of his employees. He participate in activities to this end, such as con-safety organizations, (e.g., Contractors Safety of Brazosport), incentive award programs, contractor-ograms, etc. It is expected that each contractor induct his own safety programs to best suit his parti-eds.

1.1 American Standards Association, Z 16.1 stan-"Recording and Measuring Work Injury Experience" e used as a guide to classify contractor injuries.

2 Prior to starting any field work on each job, the Representative will conduct a pre-job safety con-with an authorized representative of the contractor, s Representative, available subcontractors representa-d Owner's Safety Department Representative, when e. At this time, the nature of any chemical hazards ial safety rules for the area will be reviewed with the Representative and the contractor will be provided nted copies of area rules where applicable. The safety check sheet" form (see sample) will be pre-the Owner's Representative and a copy furnished ontractor.

3 An effective system of indoctrination and educa-employees in safety and loss prevention is expected contractor. Contractors shall inform all their employees ety rules and all safety procedures before working in an plant.

3.1 Contractors shall inform all of their employees of tion and use of nearest safety shower, eye bath and y equipment such as gas masks, fire extinguishers and cets.

Contractors shall use a regular system of work in-to detect and correct hazardous conditions, safety tions and unsafe working practices.



DATE: _____

C E & C S CONSTRUCTION DEPARTMENT PRE-JOB SAFETY CHECK SHEET

JOB _____ BLOCK: _____

C O NUMBER _____ CONTRACTOR _____

1 Standard Emergency signals fully understood?	Yes ☐	No ☐
2 Contractor responsibility in time of emergency understood?	Yes ☐	No ☐
3 Fire and ambulance telephone numbers known?	Yes ☐	No ☐
4 Areas for possible evacuation designated?	Yes ☐	No ☐
5 Fire protection requirements known and plans made for provision of adequate equipment?	Yes ☐	No ☐
6 Special safety rules and signals for this area known? (Owner will provide printed special rules where available.)	Yes ☐	No ☐
7 Nature of chemical or special hazards for area reviewed with Process Representative?	Yes ☐	No ☐
8 Special safety equipment for this area known?	Yes ☐	No ☐
9 Safety Showers and Eye Wash locations known?	Yes ☐	No ☐
10 Safe work permit understood? (Designated place(s) to obtain known?)	Yes ☐	No ☐
11 Red Tag rule understood?	Yes ☐	No ☐
12 Smoking area designated?	Yes ☐	No ☐
13 Contractor scaffold rules known?	Yes ☐	No ☐
14 Crane inspection and critical lift procedure understood?	Yes ☐	No ☐
15 Do you have a copy of and understand "Safety & Loss Prevention Manual for Contractors?"	Yes ☐	No ☐
16 Are your Subcontractors aware of above rules and procedures?	Yes ☐	No ☐

REMARKS (Explain all No answers): _____

Contractor Representative	Date	Subcontractor	Date
Owner's Representative	Date	Subcontractor	Date
Process Representative	Date	Subcontractor	Date
Owner's Safety Representative	Date	Subcontractor	Date

1.1 Orderliness is a basic requirement for all jobs to be maintained at all times. Special attention must be given to maintaining clear walkways and roadways, re-
trash, removal of slipping and tripping hazards and stacking of materials. Contractors must make every effort to keep mud, slush or other slippery substances off of roads. In cases where this cannot be avoided, contractors must clean the roadways immediately.

1.2 Temporary buildings and material storage areas must be set up as neatly as possible to present an orderly appearance.

1.3 Temporary buildings or combustible materials must not be located under power lines or pipeways. Overnight storage of equipment or vehicles is not permitted under power lines or pipeways.

1.4 Temporary buildings shall be sheathed with non-combustible material, such as transite or metal siding and each must be identified with the contractor's name.

1.5 Contractors' temporary buildings must be properly anchored immediately upon placement at the jobsite. A minimum of four 4" screw anchors a minimum of 2' in the ground are required. A minimum of two such anchors are required for portable toilets.

1.6 Metal buildings served with electricity must have the building properly grounded, as well as the service switch.

Contractors must furnish trash containers made of metal with metal covers kept in place.

Contractors must report immediately to the Owner's representative by name, those employees discharged for safety infractions.

Contractors shall maintain continuous safety plans over jobs where circumstances have changed and new safety require new controls.

2.0 EMERGENCY PROCEDURES

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

2.1.1 Dial 666 and state the type of emergency.

2.1.2 Give your name, the nature of the emergency and its exact location including building number and door letter, if applicable.

2.1.3 Stay on the line until sure that the message is understood and confirmed.

2.1.4 Station someone on the road to direct emergency equipment to the scene.

2.1.5 If the "666" number does not answer, dial "O".

2.2 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:

2.2.1 GAS RELEASE _____ (continuous)

Shut down all of your equipment in operation. 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.

2.2.2 ALERT - - - - - (series of short blasts)
Shut down all of your equipment in operation. 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.

2.2.3 EVACUATE - - - - - (series of 3 short blasts)
Observe the wind direction as indicated by the alarm horn and wind vane indicator and proceed to go crosswind.

2.4 ALL CLEAR _____ (series of 3 long blasts)
is signal is given, personnel may re-enter the work
afe work permits must be reissued prior to start-

3 If operating a motor vehicle in an area where
cy signals are given, turn off the engine, get out
shicle, and be prepared to leave the area if neces-
otor vehicles, other than emergency units, must not
n into an area downwind of a gas release signal. Bar-
cross plant roads must be honored by all vehicles at

4 The contractor shall notify the proper Owner's
rative or his headquarters in person or by telephone
is possible that all employees in the area are account-
that specific employees cannot be accounted for.

5 Emergency horns are tested each Monday at 12:00
n the "All Clear" signal given first and last in the
es.

6 The Power Plant whistle is sounded in case of a

FIRST AID - INJURIES - REPORTS

The Owner's Representative shall be notified
ely in the event of any death, occupational disease,
injury or potentially significant injury to a con-
employee (whether or not it is determined that "lost
I be involved) while at work on the Owner's job.

1.1 The contractor must thoroughly investigate,
and report all details of an accident and cooperate
Owner and "Contractors Safety Council" inspection

1.2 A written report must be submitted on every
quiring medical treatment of any kind, to the
Representative on the job, no later than 10:00 A.M.
following the injury. Also any near miss, potentially

serious incident or hazardous condition that occurs, must be re-
ported in the same manner, although no injury to personnel may
be involved. Forms for these reports, "Notice of Contractor
Accident and Property Loss" are available through the
Owner's Representative. (See sample).

3.1.3 All fires must be reported, regardless of dura-
tion or extent.

3.2 Employees must report any injury to their immedi-
ate supervisor even though it may be considered slight.

3.2.1 The contractor will assure that all injured per-
sonnel report to a recognized medical facility. A First Aid
Station is available at Plant A and the Community Hospital
Emergency Room is at Plant B. The Contractor is responsi-
ble to furnish treatment reports if medical facility other than
above is used.

3.2.2 In the event of eye injuries or any serious injury,
the ambulance MUST be called.

3.2.3 In the event of accidents, ambulance runs, etc.,
contractors must exert all possible effort to keep onlookers
from the scene. The only personnel required in such areas
are those directly engaged in assisting in the emergency.

3.3 Employees must not attempt to remove foreign
material from the eyes, except by washing with water. 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. It is vital that the injured em-
ployee and others who are able to help him make sure that
thorough and complete washing of the eye is accomplished.
The ambulance MUST be called.

3.4 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 ac-
complished, shoes and clothing covering affected parts must
be removed. The Owner's Representative must be consulted

0. IF SUBMITTED BY CONTRACTOR TO THE DPMR REPRESENTATIVE AS SOON AS POSSIBLE
ON THE DATE AND THE DAY AFTER AN INJURY REQUIRING MEDICAL TREATMENT OF ANY KIND,
OR A SERIOUS INCIDENT OR HAZARDOUS CONDITION OCCURRING ALTHOUGH NO INJURY

before reuse of clothing and shoes that may have been contaminated.

4.0 INDIVIDUAL ACTION

4.1 Horseplay in any form is not allowed.

4.2 Running in the plant must be avoided except in case of an emergency.

4.3 Personnel must not climb through, under, over or between railroad cars of a train except in the performance of assigned duties.

4.4 Personnel must not make inoperative or operate safety devices such as relief valves, deluge valves, gate valves, electrical and mechanical interlocks, guards, electrical switches, etc.

4.4.1 Any accidental interruption of lines or equipment in service or any irregularities observed must be reported to the Owner's Representative and/or the Owner's operating personnel immediately.

4.5 Unsafe shortcuts, such as walking pipelines, sliding down pipe or stanchions and cutting corners to save a few steps, must be avoided.

4.6 Tools, materials or equipment must not be intentionally dropped or thrown from one level to another unless adequate precautions have been taken to assure that no injury to persons or damage to equipment will occur.

4.7 Personnel must not ride a load being handled by a crane. Slings, hooks, etc., must not be ridden, except where a crane basket or a bosun's chair and safety belt are used.

4.8 Personnel must not walk, drop or jump onto a transite roof. Where a permanent platform or walkway is not provided, a temporary walkway or spread footing shall be used to distribute the load over a large area of the transite.

4.8.1 Contractors installing transite roofs, must use a dry walkway or spread footing, or may use safety nets in the erection area. Safety nets must be of acid resistant material and designed and erected specifically for the purpose of catching a man who might fall. All safety nets must be installed and tested prior to each use.

VEHICLES AND TRAFFIC

5.1 Personnel working on Owner's property will comply with all safety rules and signs regarding traffic and vehicles at all times.

5.2 The maximum speed limit on open roads in the plant is 15 miles per hour and 10 miles per hour within block limits, otherwise designated by signs.

5.3 Vehicles must not pass a plant bus in either direction while it is stopped on plant roadways for the purpose of loading or discharging passengers except, after coming to a complete stop, the vehicle may proceed around the bus at no more than 10 miles per hour, provided the way is clear.

5.4 Smoking will not be permitted in vehicles in designated "NO SMOKING" areas.

5.5 Hauled material that overhangs the sides or ends of a truck must be red flagged at the extent of the overhang. Material must not be hauled from a single suspension cable that is free swinging beyond the sides of the truck. Dragging loose material and objects along plant roadways is prohibited.

5.6 Fuel tanks on motorized equipment must not be filled while the engine is running or when welding or other hot work is being done nearby. Smoking will not be allowed during the refueling operations.

5.7 Motorized equipment such as trucks, dozers, cranes, etc., must not be left running and unattended.

5.8 Equipment such as welding machines, pumps, etc.,

shall not be transported with the engine running.

5.9 All equipment must be in safe mechanical working condition at all times. In addition to complying with state requirements as to brakes, lights, signals, horns, mufflers, etc., vehicles must be periodically inspected by a representative of the contractor. Necessary repairs and adjustments must be made prior to their use on Owner's property.

5.10 The use of flatbeds, stakebeds, etc., as transportation for personnel will not be permitted unless adequate safety provisions are made and the vehicle is adapted for that purpose. In any case, the number of personnel must not cause overcrowding.

5.11 Riding of "Cherry Pickers", yard cranes or winch trucks, is permitted only when adequate safety provisions such as seats, platforms, rails, etc., are provided for passengers.

5.12 The maximum number of people who may ride in the cab of a pickup is three. Personnel riding in the back must be seated on the floor of the bed, or on approved "built-in" seats.

5.13 Pedestrian paths and walkways must be used whenever provided. In their absence, personnel using streets and roadways must walk facing approaching traffic.

5.14 The following rules must be observed by personnel in the operation of cranes, cherry pickers, winch trucks and similar equipment having booms or extended loads in excess of 15 feet in front of or to the rear of the equipment.

5.14.1 Stop at all stop signs.

5.14.2 At intersections, when the equipment is to proceed straight across a main thoroughfare or turn either way, the operator must stop; the flagman must get off the equipment, clear all traffic, then flag the equipment through the intersection or around the corner.

5.14.3 Before entering any thoroughfare, street, road,

from a work area within a block, the flagman must direct traffic and flag the equipment onto the road.

14.4 All booms or loads extending more than 15 feet must be marked or flagged with high visibility material when on plant roads. Traveling speeds must be safe and slow, depending upon loads, traffic, road conditions, etc.

14.5 A flagman must be provided and swinging of loads must be controlled with a tag line when moving in a congested area or where load swinging would present a hazard to personnel.

14.6 Loads or vehicles that extend out of the normal travel lanes require flagmen or escorts.

14.7 Contractors must check vertical clearances on roads to be used prior to moving equipment or high loads.

15 Safe working distances will be observed by all contractor personnel when working near overhead electric power lines and D.C. power lines and bus.

15.1 When mobile equipment (cranes, draglines, excavators, winch trucks, etc.) is used near overhead electric power lines or D.C. bus bars, the following listed safe working distances shall be observed:

Five feet minimum clearance - circuits up to 480 volts. (Telephone wires and cables are not hazardous but must not be contacted or damaged.)

Eight feet minimum clearance - 480 volts to 2400 volt circuits, open wire unprotected on insulators - D.C. power lines and bus bars - 15,000 volts shielded or armored power cables on messenger cables in pole lines.

Sixteen feet minimum clearance - 15,000 volts and 132,000 volt bare (uninsulated) bus in 132 KV substations and conductors on 132 KV power lines.

When it is necessary to work over a power line or D.C. bus or within the above listed minimum safe working distances, it shall be the contractor's responsibility to notify the Owner's Representative prior to performing any work.

5.16 Contractors must determine from the Owner's Representative when and which roads are to be used, prior to moving extremely heavy loads.

6.0 PROTECTIVE EQUIPMENT AND CLOTHING

6.1 The contractor and his employees shall recognize the importance and use of special protective equipment and clothing.

6.1.1 The contractor shall be responsible for knowing and enforcing special Owner area or job rules requiring special personnel protection.

6.1.2 Contractors shall provide their employees with the proper protective equipment required.

6.2 Approved safety glasses with side shields are a minimum requirement on all contractor jobs at all times.

6.2.1 Approved safety glasses with side shields must fulfill federal requirements (GGG-G-513) for drop ball testing and safety code for polarized "Strain" pattern.

6.2.2 Employees wearing contact lens must wear chemical goggles.

6.3 Chemical goggles, approved prior to their use, are required for working in or entering certain chemical areas which are posted with signs, or while doing chipping or power tool cleaning work on pressurized lines or equipment which contains hazardous chemicals.

6.3.1 All employees working in the vicinity of chemicals must know where the nearest safety shower and eye bathing facilities are located.

3.2 When chemical type goggles are in use, the strap must be around the back of the head, not around the front of the hat.

4 Approved plastic safety hats are required for all work. The use of metal safety hats is prohibited.

4.1 Approved plastic safety hats must fulfill requirements of Federal Specification GGG-H-142C. The major requirement in this specification says, "The specimen must withstand the drop of an 8 pound spherical weight, approximately 3.8 inches in diameter, from a distance of 5 feet, without breaking the hat, bottoming out or breaking suspension." Most skull caps, scalp guards, bump helmets, etc., do not meet this test. Safety hats shall not be drilled or modified for ventilation holes, or edges trimmed off hats.

5 The contractor shall furnish and be responsible for ensuring that his employees wear air hoods, or equivalent, supplying filtered air, when sandblasting or applying volatile material inside tanks, rooms or any other area not fully ventilated.

6 Safety belts or harnesses, with lifelines attached, shall be worn by employees when performing work in elevated areas where the use of scaffolds or ladders is impractical and a slip might result in a serious fall.

7 Personnel must wear owner approved life jackets and must be protected by handrails or lifelines when working in water wherein a drowning hazard exists.

8 Employees are expected to wear personal clothing that is safe and proper for their job. Wearing of canvas shoes, or house shoes and working in an undershirt, shorts or pants to the waist is prohibited. Safety shoes are strongly recommended.

9 Fixed blade knives used as tools of the trade must be kept in sheaths while not in use.

7.0 FIRE PROTECTION

7.1 Accumulation of trash, oily rags, combustible materials and similar fire hazards of any nature will not be permitted.

7.2 The area around welding operations must be kept free of flammable material of all kinds (wood, paper, cardboard, flammable liquids, etc.). On some jobs it may be necessary to have one of the workmen already assigned to the job to observe the welding operation and control the occurrence of fires.

7.2.1 There must be a fire extinguisher or water hose easily accessible for each welding, cutting, burning or other such operation, located in close proximity to the operation. It is the contractor's responsibility to obtain the required fire extinguishers for his welding operations through the Owner's Representative. Contractors are also responsible to arrange, through the Owner's Representative, for the recharging and resealing of extinguishers immediately after each use.

7.2.2 Special care must be taken during overhead welding operations to safeguard personnel and prevent falling sparks from starting a fire.

7.3 All tarpaulins shall be fire-retardant and identified as such by stenciling: "FR-treated (date)" with a minimum of 2" letters in diagonal corners. In lieu of this treatment, fire-proof blankets such as fiberglass or asbestos are acceptable.

7.3.1 Contractors must inspect and test all tarpaulins at least once each six months to be sure that they are still fire-retardant. Tarpaulins needing it, must be retreated or removed from the plant immediately. At this time, the tarpaulins must be re-stenciled in the same manner as in 7.3 above.

7.4 Fire plugs, extinguishers, hose racks and other emergency equipment, shall not be covered or blocked and fire equipment lanes must always be kept clear.

7.5 All heating units for offices, shops, work areas, rooms, etc., must be in good working order and properly inspected. Gas units must be provided with "flame-protective" devices and electrical units must be grounded. Heating units must be turned off at the end of each work day.

7.6 Flammable or explosive type material such as fuel, oil, etc., must be properly contained, clearly labeled, separately stored and kept clear of work areas. Appropriate warning signs must be provided in storage areas.

7.7 All cans used for transporting or transferring gas-oil fuel must be labeled by Underwriters' Laboratories or Mutual Laboratories.

7.8 Fuel storage tanks, filler hoses and the dispersing or container must be properly grounded.

7.8.1 A quick closing shut-off valve is required on the end of fuel hoses.

7.8.2 Smoking, welding or any spark or flame-producing operation must be stopped in the immediate area during fueling operations.

7.9 Welding rod cabinets presenting a fire or safety hazard will not be permitted. Cabinets of fireproof materials and with strip heaters are recommended. If light bulbs are used, they must be securely guarded with adequate space around to the cabinet and to stored material. Metal cabinets must be grounded in an approved manner.

7.10 Volatile materials must not be applied near an open flame. If such material is to be applied in a vessel, or in a poorly ventilated, confined area, only explosion-proof electrical connections will be used. The contractor must post such areas as "No Smoking."

7.11 Heating equipment for freeze protection of concrete must be approved by the Owner's Representative prior to use.

7.12 Welding or cutting torches and hoses must not be connected to cylinders when stored in any enclosure or building. When work is shut down and equipment is unattended, close all valves at the gas and oxygen cylinders, bleed lines and check five minutes later for pressure build-up. If there is no build-up, bleed hoses at the torch, remove hoses from cylinders and store. No smoking will be permitted during this shutdown procedure.

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

7.13.1 Oxygen cylinders in storage and not in use must be separated from gas cylinders by a fire retardant partition or a minimum distance of 10 feet.

7.13.2 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.

7.14 All "No Smoking" restrictions in specified areas must be strictly observed. Smoking is not permitted in vehicles in designated "No Smoking" areas.

7.15 Compressed gases, including air, must not be used for cleaning of clothes, the body or work areas. Oxygen must not be used for pressure testing purposes.

7.16 Adequate ventilation must be provided when cleaning agents are used.

7.17 Contractors must not dump flammable or toxic materials into sanitary sewers or waste water system without prior clearance of the Owner's Representative.

8.0 MACHINERY, CRANES, TOOLS AND EQUIPMENT

8.1 The safe designed capacity of any tool or piece of

ent must not be exceeded. Tools or equipment must be modified in any manner that reduces the original safety.

1.2 All contractor owned, leased or rented equipment in safe mechanical working condition to render safe at all times.

1.2.1. Equipment must be inspected by contractor superior to its use on a job and periodically thereafter to that it is in safe working order. Crane inspections must be in writing to the Owner's Representative using Owner's "Hoisting Equipment Inspection" form. (See Sample) Special attention must be given to such items as cables, booms, blocks, hooks, grounds, electrical cords and devices. Equipment must be shut down before repairs or adjustments are made.

1.2.2 Defective tools and equipment must be removed from job immediately and if repairable, must be properly repaired before reuse on Owner's job.

1.2.3 Machinery, tools and equipment must not be used without all guards and safety devices in place and operating properly.

1.2.4 The contractor has the complete responsibility for safe operation when using hoisting equipment to make the lift. The contractor shall verify weights of loads to be lifted. No lift shall be lifted which exceeds the Manufacturer's rated capacity of the crane. When one of the following conditions prevail, the contractor must submit in writing, using Owner's "Critical Lift Check Sheet", (see sample), on the safety planning for the lift to the Owner's Representative, prior to starting the lift.

The load exceeds 80% of rated load chart for crane.

The load exceeds 50% of rated load chart for crane, and possible failure would endanger existing facilities.

Two booms are required to make the lift.

Poles or derricks have been erected for this specific lift.

HOISTING EQUIPMENT INSPECTION

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 ON FILE _____

	CONDITION
1. Identification and high visibility markings	_____
2. Hooks (pins-swivels)	_____
3. Boom sheaves and blocks (straps)	_____
4. Traveling block (pins-grease fittings)	_____
5. Cable drums (facing and becket)	_____
6. Hoist lock (catch on brakes)	_____
7. Clutches (bands-pins-cotter pins)	_____
8. Whip line (condition of cable)	_____
9. Load line	_____
10. Boom line	_____
11. Boom and job pennants	_____
12. Main boom (structural members - pins)	_____
13. Jib (structural members - pins)	_____
14. Gantry (A-frame) - (pins-sheaves-straps)	_____
15. Swing lock	_____
16. Hydraulic or air system	_____
17. Lighting system	_____
18. Painting	_____
19. Drive chains (tension)	_____
20. Tires (air pressure-damage)	_____
21. Steering mechanism	_____
22. Counterweights	_____
23. Cab, platforms, steps, etc. (access)	_____
24. Fire extinguisher	_____
25. Boom hoist safety device	_____
26. Power lowering - whip line	_____
27. Power lowering- load line	_____
28. Boom base pins	_____
29. Housekeeping	_____

INSPECTOR _____
AUDITED BY _____

CHECK LIST FOR CRITICAL LIFTS

#/W. O. P. _____

DESCRIPTION _____

ATION _____

REPRESENTATIVE _____

HOISTING DATA:

1. CONTRACTOR _____

2. SUPERINTENDENT _____

3. SUPERVISOR RESPONSIBLE FOR LIFT _____

DESCRIPTION OF ITEM TO BE RAISED _____

MAJOR HOISTING EQUIPMENT TO BE USED

1. _____

2. _____

3. _____

4. _____

EQUIPMENT & LIFT RELATIONSHIP

1. OPERATING RADIUS _____

2. BOOM LENGTH _____

3. ALLOWABLE LOAD (FROM LOAD CHART) _____

4. RATIO OF LIFT TO ALLOWABLE LOAD _____

Check List for
Critical Lifts

Page 3

8. CONDITION OF HOISTING EQUIPMENT & RIGGING:

A. HAS EQUIPMENT BEEN REINSPECTED FOR THIS LIFT? _____

B. HAS ALL EQUIPMENT & RIGGING BEEN INSPECTED AND FOUND IN ACCEPT-
ABLE CONDITION FOR THIS LIFT? _____

9. GUYS ANCHORS & GUYS

A. ADEQUACY OF FOUNDATION FOR FOOT BLOCKS _____

B. ADEQUACY, NUMBER, AND LOCATION OF GUYS & ANCHORS _____

C. FOOT BLOCKS ARE TO BE ANCHORED _____

D. CONDITION OF ALL CABLE, INCLUDING SPLICES, CLAMPS, THIMBLES, AND
OTHER HARDWARE _____

10. STABILITY OF GROUND AREA:

A. CHECK SOIL BEARING ALLOWABLE LOAD _____

B. WILL MATS BE REQUIRED? _____

C. ANY UNDERGROUND INSTALLATIONS NEEDING SPECIAL TREATMENT _____

11. OPERATORS:

WHAT IS OPERATOR'S EXPERIENCE ON THIS EQUIPMENT AND THIS TYPE OF LIFT? _____

12. REMARKS:

1st for
1 Lifts

Page 2

CLEARANCE BETWEEN BOOM & LIFT _____

CLEARANCE TO SURROUNDING FACILITIES _____

SCHEDULE OF OPERATIONS (INCLUDE TIME FOR RIGGING & EQUIPMENT INSPECTIONS).

5 FOR CRITICAL LIFT:

LOAD EXCEEDS 80% OF LOAD CHART FOR CRANE OR DERRICK _____

LOAD EXCEEDS 50% OF LOAD CHART, AND FAILURE WOULD ENDANGER

EXISTING FACILITIES _____

NO BOOMS ARE REQUIRED _____

CRANES OR DERRICKS HAVE BEEN ERECTED FOR THIS SPECIFIC LIFT _____

RIGHT OF CRITICAL LIFT WAS OBTAINED:

CERTIFIED SCALE WEIGHT _____

WEIGHT CALCULATED INDEPENDENTLY BY MORE THAN ONE SOURCE.

SOURCE _____ WEIGHT _____

SOURCE _____ WEIGHT _____

IF LIFT IS AN EXISTING ITEM (BEING REMOVED OR DEMOLISHED), THE WEIGHT IS TO BE RECALCULATED, TAKING INTO ACCOUNT ALL MODIFICATIONS INCLUDING INTERNAL AS WELL AS AN ALLOWANCE FOR SCALE, DIRT, SLUDGE, INSULATION, LIQUID, ETC.

SOURCE _____ WEIGHT _____

SOURCE _____ WEIGHT _____

Check List for
Critical Lifts

Nothing in this submission and/or acceptance of this CHECK LIST is to be considered as relieving the Contractors of any responsibility for a safe operation.

Contractor

By: _____

Title: _____

RESUME OF ACTUAL SCHEDULE:

DATE OF LIFT _____

INSPECTIONS COMPLETED _____

LIFT STARTED _____

PERMANENT SUPPORTS COMPLETED _____

TOTAL TIME _____

2.5 If burning of lugs or other such flame producing is may be required during crane hoisting operations, permits for proper safe work permits must be made before operation begins.

3 Equipment with exposed gears, belts, couplings, etc. provided with proper guards.

4 All pressure vessels of construction equipment must be hydrostatically tested annually. Items in this category are exceeding 6 inches (inside diameter) and with internal operating pressure exceeding 15 PSI or those provided with a relief valve with a setting greater than 18 PSIG or pressure disc whose bursting pressure is greater than 25

4.1 These tests must be performed during the month of January, each year by the owner or lessee of the equipment. Lives must be removed and the vessels hydrostatically tested one and one-half times the maximum allowable working pressure of the unit. A thorough visual external inspection must be made.

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

4.3 Metal identification tags must be attached to vessels bearing pressure setting, date of test, name of person conducting test and initials of person conducting the test.

4.4 Contractors will furnish the Owner's Representative with a certificate for each piece of equipment. Each certificate must be signed by the test conductor and a representative of the company owning the equipment.

4.5 The Owner's Representative will forward each certificate to the CE & CS Construction Department central file #2402, where an equipment number will be assigned. The certificate will be kept on file. The contractor will be advised of the assigned number by the Owner's Representative.

8.4.6 Contractors will paint or stencil the assigned equipment number in plain view on the equipment. Numbers shall be white, approximately 3" high on a green background. The green background will remain for 1967 and will be changed each year as directed.

8.4.7 Equipment arriving in the plant for the first time after the January test period each year must be tested at that time and retested the following January.

8.4.8 Equipment such as cranes, dozers, tractor-floats, etc., having pressure vessels, must be visually inspected upon entry to the plant and must meet the above test requirements within ten days.

8.5 Electrical tools and equipment operating at more than 32 volts must be properly grounded. Certain test equipment such as oscilloscopes, vacuum tube voltmeters and signal generators, as well as certain areas where exposed d.c. equipment is used, do not require grounding and proper operational procedures must be ascertained from the Owner's Representative in the above areas.

8.6 Only 32 volt or less electrical service is to be used in connection with drop lights when working inside metallic vessels.

8.7 When arc welding is being done in an area restricted by a safe work permit, the grounding lead must be connected to the work within the limits as provided in the safe work permit.

8.8 Any contract provision for connection to an Owner's plant services for construction use must be cleared with the Owner's Representative. The turning off and on of the supply shall be done only by authorized Owner's Personnel.

8.9 Gloves must not be worn while using grinders, drills, saws or any tools where gloves are apt to become entangled.

10. Loose clothing must not be worn while working machinery.

11. Personnel must not crank any machinery with their

12. Hose connectors and adaptors must be of a standard manufacture and used only for the type of service

12.1. In order to insure positive locking at all times, tools must be in good condition and not abused. Sand connections shall be the safety lock type which prevents accidental disengagement.

12.2. Air pressure on pneumatic tools must be bled before tools are disconnected from air supply.

LADDERS AND SCAFFOLDS

All ladders must be of the proper length and in good condition before using them. All unacceptable ladders must be immediately removed from Owner's property.

1. Ladders are not to be painted with anything other than paint or linseed oil.

2. All straight ladders must be tied off or held and ladders higher than ten feet must be tied off at the top or the bottom by another workman. Personnel must not be on the top step of any stepladder.

3. When climbing a ladder, personnel must face the ladder and keep both hands free for climbing.

4. Set straight ladders so that the bottom is out from the wall about one-fourth of the distance from the upper end to the bottom.

5. All ladders must be provided with non-skid adjusters or properly supported on a level surface.

9.1.6. The area around the bottom of all ladders must be free from slippery substance and tripping hazards.

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

9.1.8. The top section of extension ladders are not to be used by themselves.

9.2. The use of #9 soft annealed wire should be minimized on scaffolds.

9.2.1. When #9 soft annealed wire is used, a minimum of two separate strands must be used to tie scaffold handrails, braces, etc. The ties must be crossed to form a lock and prevent slipping in any direction.

9.2.2. Do not reuse #9 soft annealed wire for any purpose.

9.3. Makeshift scaffolds such as boxes, crates and drums must not be used.

9.4. Wood scaffolding, aluminum ladders, aluminum scaffolds and aluminum pencil boards are not permitted except in special cases as specified in job specifications or by prior written approval from the Owner's Representative.

9.5. The following rules apply to all patented metal scaffolds.

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

9.5.2. All scaffolds and allied equipment must be kept in good repair.

9.5.3. Equipment that is damaged or deteriorated to the extent that it is unsafe shall not be used. Such equipment shall be removed from the Owner's property.

- .4 Compensate for unevenness of ground by using screws in addition to proper blocking.
- .5 Do not force braces to fit. Adjust evenness of until the proper fit can be made with ease.
- .6 Use ladders when climbing scaffold rather than braces and hand rails.
- .7 Horizontal diagonal bracing shall be used at intermediate levels of thirty feet to prevent all scaffolds.
- .8 Planking overhang shall be 3-5/8" on stackup. 1" x 4" wood cleats shall be nailed across top of it each end outside end frames. 2" x 2" cleats shall underside each end of plank with 2-1/4" stove bolts.
- .9 The maximum span for guying or tying off all fixed every 18' of elevation.

The following rules apply to rolling tower scaffolds:

- .1 The minimum base dimensions for towers shall be
- .2 Towers of a height greater than three times the base dimension must be guyed or tied off while being used or dismantled.
- .3 Caster brakes must be applied when not in motion.
- .4 Towers must be free of men, material and equipment being moved. Care must be exercised while
- .5 Surface area where tower is being moved shall be free of rubble or any material that may cause the tower to
- .6 Do not attempt to move a rolling tower without

sufficient help.

9.6.7 Do not extend adjusting screws beyond the limits specified by the equipment manufacturer.

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

9.6.9 Horizontal diagonal bracing is to be used at the bottom and at intermediate levels of 30 feet.

9.6.10 Do not use knee braces or cantilevered brackets on rolling towers.

9.7 The following rules apply to suspended scaffolds:

9.7.1 Chains or 1/4" (minimum) steel cable shall be used to support suspended scaffolds. All suspended scaffolds shall be anchored to prevent swinging. Chains so used shall be made of not less than 1/4" links* and shall be inspected immediately prior to each use.

*1/4" proof coil loading chain	
Safe Load	900 lbs.
5/16" proof coil loading chain	
Safe Load	1,360 lbs.
5/16" proof coil loading chain	
Proof-tested Safe Load	2,720 lbs.
5/16" proof coil loading chain	
Unlimited Safe Load	5,440 lbs.

9.7.2 The suspended support must be insulated when arc welding is to be performed from platform, thus avoiding accidental arcing and subsequent failure.

9.7.3 Block and falls shall be a minimum of two sheaves for 3/4" rope and the minimum size rope shall be 5/8". Acid resistant rope shall be used in acid or caustic areas. Tail ropes shall be placed in an open container for protection while used in an acid area or above operating machinery, pumps, etc. All ropes and blocks must be inspected and tested prior to each

be taken down and stored inside at the end of each work

2.8 The following rules apply to all scaffolds:

2.8.1 Scaffolds and related material shall be carefully inspected at regular intervals and particularly just before using.

2.8.2 Provide sufficient sills or underpinning on all scaffolds to be erected on filled or otherwise soft ground. Scaffolds shall not be used for this purpose.

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

2.8.4 Anchor running scaffolds to wall approximately 28' of length and 18' of height. Use additional care using pulley arms.

2.8.5 Handrailing and access ladders must be used on scaffolds regardless of height. Scaffolds higher than 30' columns, tanks, etc., must have access ladders connected on the inside, unless a ladder cage is provided. Handrails must be at a height sufficient to provide maximum person safety.

2.8.6 Scaffolds must not be used as material hoist or for mounting derricks without first determining the stresses involved.

2.8.7 Erect scaffold in such a manner that ladder is plumb and lined up from top to bottom.

2.8.8 Lumber used in the construction of platform shall be good quality and reasonably straight grained. It shall be free from injurious ring shakes, checks, splits, cross grains, knots, knots in groups, decay and growth characteristics which materially decreases the strength of the lumber. It shall not be painted all over, as this would conceal defects. Scaffold boards shall be identified by painting red. All scaffold boards shall be used exclusively for their purpose. Nothing less than 2"x4" material shall be used for handrails on wooden scaffolds.

9.8.9 The normal size of planking shall be determined from Table I. These values are for planks with the wide face up, with the loads concentrated at the center. Loads given in the table are net. Allowance has been made for the weight of the planking. If select structural coast region Douglas fir, merchantable structural square and sound southern pine is used, the loads may be increased 45 percent.

9.8.10 Planks used for platforms shall be of uniform thickness, laid close together. These planks must be overlapped at the bearers. An overlap of at least two feet must be allowed with the bearing in the center of the overlap. When planks overhang a bearer more than one tenth of the length of the span, the planks must be securely fastened to the bearer at the opposite end to prevent tipping.

9.8.11 All nails used in scaffold construction shall be driven full length. If double headed nails are used, they shall be driven to the first head only and may not be used on platforms or walkways. No nail smaller than 8d shall be used in this construction and enough nails must be driven to support the designed loads. The design must be such that no nail is subject to a direct pull.

9.8.12 Where beams are used in scaffolding, the schedule of loads shown in Table II, shall be followed. Loading on cantilever type beams used for tool and material hoists is shown in Table III. It should be noted that the loading at the center of bearing point is 4 times as great as the load being lifted and the bearing should be checked to ascertain if it will support the contemplated load. The inboard end of the beam has a force upward of twice the load and must be securely fastened with no nails in direct pull.

9.8.13 Platforms shall be kept clear of slippery substances and tripping hazards.

10.0 DANGER WARNING AND CAUTION TAGS

10.1 Danger Tags (Red)

10.1.1 To insure that operating status of equipment is not

TABLE I
SAFE CENTER LOADS FOR SCAFFOLD
PLANK IN POUNDS

In t	SIZE OF PLANK			
	2 x 10 Dressed To 1 3/4 x 9 1/2	2 x 12 Dressed To 1 3/4 x 11 1/2	3 x 10 Dressed To 2 3/4 x 9 1/2	3 x 12 Dressed To 2 3/4 x 11 1/2
	256	309	667	807
	192	232	500	605
	153	186	400	484
	128	155	333	404
	110	133	286	346
		116	250	303

TABLE II
CENTER LOADS ON TIMBER USED AS
BEAMS IN POUNDS

LENGTH OF SPAN IN FEET									
5	6	8	10	12	14	16	20	24	
440	290	210							
725	575	420	330	260	215				
780	650	470	360	290	240	190			
1400	1150	850	660	530	450	370	270	190	
2190	1820	1350	1050	860	710	600	450	320	
2800	2630	1950	1530	1250	1050	890	670	510	
2100	1730	1290	990	810	680	560	410	290	
3290	2750	2120	1590	1300	1070	900	670	490	
4525	3940	2920	2300	1880	1570	1340	1000	660	

TABLE III
SAFE LOADING FOR SIMPLE MATERIAL
T ON CANTILEVER BEAM IN POUNDS

LENGTH OF CANTILEVER (B) IN FEET							
2	3	4	5	6	7	8	
220	160	105	80	65			
495	320	260	190	150	125	105	
740	490	360	285	230	190	160	
1325	875	650	515	420	350	300	
1765	1165	865	685	560	470	400	

dimension from front bearing to rear anchor must be equal to or an cantilever projection "B" in table.

changed while it is being used or worked on, red danger tags must be attached to the controls so that personnel will know not to use them. These tags must be used to protect personnel exposed to hazards of equipment and must be respected by all personnel. The personnel responsible for the operation of equipment or their designee must clear and tag the equipment. Any personnel whose safety could be endangered while working on this equipment must affix their tag. Violation of red danger tag rules will result in disciplinary action up to and including rejection from any work on Owner's property.

10.1.2 No control such as a valve, switch, clutch, etc. is to be operated by anyone while a red danger tag is attached. If a control must be operated intermittently such as for testing equipment, the red danger tag must be properly removed before each operation. Attachment of danger tags to equipment controls does not mean that equipment has been cleared to work on. When work is to be done on tagged-out equipment, personnel responsible for the operation of the equipment are responsible for clearing the equipment and making it safe for others to work on.

10.1.3 Whenever the operation or use of any equipment may endanger anyone, a request must be made to supervision of the group which operates the equipment to clear and tag the equipment. "Clearing" means making the equipment inoperable and safe for others to work on. The authority to clear and tag equipment may be delegated by this supervision to any qualified personnel after supervision has assured themselves that the person delegated can properly clear the particular job involved.

10.1.4 After the group which operates the equipment has cleared and tagged the equipment, each worker or group of workers who may be exposed to the hazards must tag the equipment for their protection. When red danger tags are attached to equipment by persons other than those responsible for its operation, prior approval from the person responsible shall be obtained.

10.1.5 As the individual jobs have been completed, each worker or group of workers must remove their tags immediately.

10.1.6 The group responsible for the equipment must remove their tag first and remove their tags last.

10.1.7 Red danger tags may be removed only upon authorization of the person designated on the tag, except in the following specific instances. The supervisor of any person who fails to remove a red danger tag when a job has been completed may authorize the removal of the tag by another person in his organization after he has determined to his satisfaction that the equipment can be operated in a safe manner. Authorizations across line organizations is permissible except for those cases where Section 10.1.5 states: "Individual jobs have been completed, each worker of workers must remove their tags immediately." If a tag is violated and no supervision in the violating organization is in the plant. In such cases, the Operating Department supervisors must contact supervision in the violating organization to obtain authority to remove the tag. The Operating Department supervisor must first determine that the equipment can be operated in a safe manner and that all violating workers have left the immediate area. In the case on the tag entitled, "Removal will be ordered by _____," it is permissible to designate some classification such as foreman, electrician, pipefitter, etc., in place of a special individual's name.

10.1.8 At the discretion of the supervisor, locks may be placed on valve and switches in addition to, but not removed from, red danger tags.

10.1.9 Tags removed must be filled out and turned in to the Owner's Representative.

10.2 Warning Tags (Green)

10.2.1 When it is necessary to convey instructions or information prior to operation of equipment controls, green "warning" tags are to be attached to the controls.

10.2.2 Green "warning" tags should be removed when the instructions set forth on the tag have been met.

10.3 Caution Tags (White)

10.3.1 White caution tags are affixed to mechanical or electrical equipment by the Owner's Representative to prevent operation of such equipment by anyone until items on the tag have been completed.

10.3.2 The tag provides spaces for meggering, rotation, final alignment and lubrication of equipment. When appropriate action has been taken, then personnel performing the work signs and dates the tag.

10.3.3 When tagged equipment is released to the Owner, a representative of operations and the Owner's Representative sign the tag which is kept by the Owner's Representative until job completion.

11.0 SAFE WORK PERMITS

11.1 Safe Work Permits issued by the Owner to contractor personnel are required for certain hazardous locations and conditions. These permits are designed to provide a means of checking at the job site the safety of such jobs as, but not limited to, entering closed vessels; working on electrical gear; performing hot tap work; welding, cutting on, breaking in or repairing pipelines or vessels in operation or under pressure or that have contained hazardous materials. These permits also cover work involving the use of flame or spark producing equipment in hazardous areas or near an open ditch and work on machinery.

11.2 Contractor supervision must be in close contact with the progress of work as well as communicating with the Owner's Representative for up to date status of operations. Further, contractor supervision must be certain that all personnel involved are informed as to specific procedures and changes in the situation.

11.3 Safe Work Permits are to be initially requested through the Owner's Representative and issued by the Owner's Representative to the operating area or facility supervision involved on any job where the Safe Work Permit is applicable. More than one

ork Permit may be required on certain jobs which will be retained upon obtaining each Safe Work Permit.

11.4 Personnel must give a careful and complete description of the work to be done to the person issuing the Safe Work Permit.

11.4.1 Where a job presents a serious man hazard due to physical, mechanical, electrical, temperature or height, it is mandatory that a written, safe job procedure be submitted with the request for the Safe Work Permit. This procedure must be signed by the Owner's Representative, Project Representative, and the contractor, who thereby agree that the procedure allows the job to be done safely.

11.5 Directions and restrictions noted on Safe Work Permits must be carefully followed.

11.6 A Safe Work Permit must be reissued for a job if there is evidence that conditions have changed subsequent to the issuance of the original Safe Work Permit.

11.7 Permits issued for jobs that last longer than one day must be reissued for that job each day. By mutual agreement of the parties involved, permits for these jobs may be issued for longer or shorter periods of time.

11.8 Vessels in an existing facility to be entered must be made safe for personnel by such measures as disconnecting, blanking, or double block and bleed on connecting piping. If precautions are impractical, a detailed procedure for making the work in a safe manner must be prescribed as set forth in paragraph 11.4.1.

11.9 Vessels in an existing facility to be welded on, must be positively checked inside for flammable or toxic gas and/or liquids and Safe Work Permit issued and heat is applied.

11.10 The contractor may request Safe Work Permits for environmental protection. Safety checks by the Owner for dangerous gases or chemicals should be requested through the

Owner's Representative, when there is any uncertainty.

11.11 Safe Work Permits are required for all excavation work done with machinery, i.e., gradalls, draglines, augers, ditching machines, etc.

11.12 All Safe Work Permits in the area affected are automatically cancelled when an emergency signal is sounded and must be reissued after the all clear signal.

12.0 EXCAVATIONS, FLOOR OPENINGS, BARRICADES

12.1 Where a safety hazard would be created for the personnel involved, and/or others, excavations such as ditches, trenches, or bell holes should be sloped sufficiently to prevent cave-ins or slides. If sloping is impractical, shoring must be used in cases whenever the vertical dimension exceeds four feet.

12.1.1 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.

12.2 Contractors must provide adequate barricades, covers, handrails, signals, flagmen, or other appropriate warning devices to protect personnel near any hazardous operation or excavation. Floor openings, open trenches, excavations, etc., shall be covered when handrails or barricades do not provide adequate protection to personnel.

12.2.1 Contractors must notify the Owner's Representative of necessary obstruction on road shoulders on the day it occurs.

12.2.2 Contractors must obtain approval from the Owner's Representative at least one day prior to cutting roads or otherwise obstructing traffic on plant roads.

12.3 Grade lines, ropes, chains, etc., must be sufficiently marked in order to be visible day or night.

13.4 No obstruction of any kind, whether permanent or temporary, is permitted within 8'-9" horizontally from the side of any railroad track and within 22'-6" vertically from the top of the rail. Specific authorization from the Owner's Representative as well as blue flags are required for boring under or excavating adjacent to railroad tracks. Blue flags must be placed on railroad tracks when the entrance to the work would present a hazard to personnel or equipment.

13.5 In locations where strictly temporary loading or unloading operations are to be undertaken, blue flags and derails available through the Owner's Representative must be used by personnel engaged in these operations to pre-empt running of the work by a train. Blue lights, available through the Owner's Representative, must be attached to the end of the work at night. Placement of blue flags and portable derails must have prior clearance with the Owner's Representative who will in turn notify the Traffic Department.

13.5.1 Blue flags must be placed on the tracks so they are in unobstructed view of the train crew and they must be placed at a minimum of two car lengths (100 feet) in front of the work they are intended to protect. Exceptions to the minimum distance may be made by the Owner's Representative where the work installations do not allow sufficient space.

13.5.2 Blue flags and portable derails must be removed immediately when the hazard for which they were installed no longer exists.

RADIATION

14.1 All state and/or federal laws governing use, storage, handling of a radiation source must be complied with.

14.2 A minimum of two qualified people are required for the performance of any radiographic work.

14.3 In locations where a radiation source is used or stored, regulations require that it be marked with a "Radioactive Material" sign. This sign is for the purpose of informing personnel in the area that such material is present, and not that

a safety hazard due to radiation exists.

13.3.1 Only authorized personnel may enter an area marked by "Radiation Area" sign.

13.3.2 All areas where a radiation hazard exists must be roped off all the way around the area and marked conspicuously by standard signs at a safe distance from the source of radiation. These signs bear the radiation symbol of magenta (or purple) on a yellow background with the words "Caution-Radiation Area."

13.3.3 "Radiation Area" signs must be removed when a radiation hazard no longer exists in the affected area.

13.3.4 Equipment containing a source of radiation must not be handled, uncrated or installed without prior clearance with the Owner's Representative.

14.0 DEMOLITION

14.1 This section specifically covers the demolition (removal) of facilities that have been abandoned. Due to the inherent hazards in this type of work, special care must be devoted to safe procedures, scope understanding and communications concerning the safe clearance of work.

14.2 It is not appropriate to make assumptions in any stage of a demolition job. Responsibilities must be delegated only to those whose profession qualify them to make the necessary judgments and decisions that are required to assure the safest possible prosecution of the job. From start to finish, each person connected with a demolition job must adopt an attitude of "Prepare For Any Possibility."

14.3 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.

14.4 Special care shall be exercised to locate and mark old underground or otherwise hidden lines, cables and

vers using the best available information and Owner's
2.

.5 The pre-job safety meeting with the contractor, as
n Section 1 of this manual, shall devote special atten-
eplanning the safety aspects of demolition jobs.

.5.1 Steps of dismantling and loads to be handled shall
wed with the Owner's Representative prior to starting

.5.2 Temporary provisions must be made where safety
eye wash baths and fire extinguishers are being
the work area.