

MAR 28 1988

LIGHT HYDROCARBON NO. 7
ELECTRICAL CLEARING PROCEDURES

PROCEDURES APPLICABLE:
1, 2, 3, 3A, 4, 5, 6, 7,
8, 9, 10, AND 11

DO A 034404
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2300 VOLT EQUIPMENT

PROCEDURE # 1

440 VOLT EQUIPMENT:

TESTING - Voltage
- Load
- Ground

• # 2
• # 3 & 3A
• # 8

Pulling or Replacing Fuses

• # 4

Equipment Protected by Circuit Breakers

• # 5

Removing and Replacing Starters from
Plus-in M.C.C.

• # 6

E. P. C. Type Enclosures, Outside Racks

• # 7

Locating a Ground on 440 Volt System

• # 8

Testing Time Delay Relays

• # 9

Working on 110 Volt Control Circuits

• #10

Working Within 440 Volt Motor Control
Center, Motor Starter or Disconnect

• #11

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SCOPE OF WORK

- Procedure 1 Any work within 2300 volt Allis-Chalmers Space Maker or General Electric switchgear other than incoming energized lines.
- Procedure 2 Taking voltage readings on Nema 1 and 4 enclosed starters and disconnects.
- Procedure 3 Taking load check on 440 volt equipment within starter enclosure, except explosion proof gear or outdoor starter racks.
- Procedure 3A Load check on 440 volt equipment outside of the starter enclosure, but including isolated wire troughs and outside conduit.
- Procedure 4 Pulling or replacing 440 volt fuses in any 440 volt switchgear with disconnect ahead of fuses, including G.E. 7700 Motor Control Center.
- Procedure 5 Working on 440 volt equipment protected by thermal circuit breakers, except E.P.C. type starters on outside Starter Racks
- Procedure 6 Removing and replacing starters from 440 volt plug in load centers.
- Procedure 7 Any work within 440 volt explosion proof combination motor starter (G.E. and Crouse-Hinds) other than energized incoming terminals.
- Procedure 8 Locating a ground on a 440 volt system using a resistance load pulsing to ground detector, and a clamp-on amf meter.
- Procedure 9 Testing or adjusting time delay relays within 440 volt starters with fusible disconnects.
- Procedure 10 Work on 110 volt control circuits of 440 volt switchgear with unexposed line connections and breakers.
- Procedure 11 Any work within 440 volt motor control center motor starter or disconnect other than energized incoming terminals.

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ELECTRICAL CLEARING PROCEDURE #1

Area: LHC #7, B-7200

Scope of Work: Any work within 2300 volt General Electric switchgear other than energized incoming lines.

Hazards: (1) Flash and/or arcing
(2) Shock Hazard

Safety Equipment: (1) Hard hat and side shield glasses
(2) Electrical Rubber Gloves
(3) Approved Voltage Tester

Remember: (1) Have owner's permission
(2) Use your I.R.S.
(3) This procedure requires an E.S.W.P.

ATTENTION: Vital Step

CAUTION: Potential Hazard

Electrical Foreman Must Be Present When Cleared!

JOB PROCEDURE:

1. Have owner's permission to do job.
2. Verify on one line diagram and nameplate equipment to be worked on.
3. Check amp meter on gear and be sure there is no load.
4. Have owner move door handle to open position and hang red tag. Hang your Red Tag over owner's.
5. Open door and visually confirm racked out position of contactor.
6. Put on rubber gloves and test Bodendieck on Known Source.
7. Still wearing rubber gloves, check contactor for voltage. If none present, re-check tester on Known Source, to verify correct operation of instrument.
8. Remove contactor from cubicle or pull all fuses, load, P.T. and control, making sure shuttle barrier is in place over line side contacts.

Electrical Clearing Procedure #1

9. If disconnecting motor, turn off "Test Power" switches at lighting panel and Red Tag.
10. If disconnecting motor, try to start motor as final precaution, accept E.S.W.P. from owner, and proceed with work.
11. When work is complete, reverse steps #8, 5 and 4. Complete E.S.W.P. and return gear to owner for operation.

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ELECTRICAL CLEARING PROCEDURE #2

Area: LHC #7, B-7200

Scope of Work: Take voltage readings on 440 volt NEMA 1 and NEMA 4 enclosed starters and disconnects.

Hazards: (1) Flash and/or arcing
(2) Shock Hazard

Safety Equipment: (1) Hard hat and side shield glasses
(2) Electrical Rubber Gloves
(3) Approved Voltage Tester

Remember: (1) Have owner's permission
(2) Use your I.R.S.

CAUTION: > Potential Hazard

Rubber Gloves Must Be Worn When Testing 440 Volt or Higher

JOB PROCEDURE:

1. Have owner's permission to do job.
2. Verify on safety one line diagram and nameplates starter or unit to be checked.
- > 3. Wearing rubber gloves, lower bottom tank on EPC enclosures or open door exposing leads on NEMA 1 and NEMA 4 enclosures.
- > 4. On EPC enclosure, wearing flash protection, close breaker.
- > 5. Put on rubber gloves. Check voltage using approved 440 volt tester. Do not use volt ohmeter. If possible, open circuit breaker or disconnect device before clipping on leads.
6. Make note of readings and notify owner when job is complete.

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ELECTRICAL CLEARING PROCEDURE #3

Area: LHC #7, B-7200

Scope of Work: Load check on 440 volt equipment within starter enclosure; except explosion proof E.P.C. housed starters in field.

Hazards: (1) Flash and/or arcing
(2) Shock Hazard

Safety Equipment: (1) Hard hat and side shield glasses
(2) Electrical Rubber Gloves
(3) Clamp on Amp-meter

Remember: (1) Have owner's permission
(2) Use your I.R.S.

ATTENTION: Vital Step

CAUTION: Potential Hazard

RUBBER GLOVES MUST BE WORN WHEN TESTING 440 VOLT OR HIGHER

JOB PROCEDURE:

1. Have owner's permission to do job.
2. Verify by nameplate and on safety one line diagram that starter to be checked is correct.
3. Carefully open door to starter without disengaging load. Stand to one side when opening door.
4. Set amp meter to a range higher than Full load rating of motor.
5. Put on rubber gloves, attach meter around one 'T' lead at a time, noting readings.
6. When all three phases are read and noted, close door carefully, notify production job is complete.

LHC47

ELECTRICAL CLEARING PROCEDURE #3A

Area: LHC #7, R-7200

Scope of Work: Load check on 440 volt equipment outside of the starter enclosure, but including isolated wire troughs and outside conduit.

Hazards: (1) Possible electrical shock because of faulty insulation.

Safety Equipment: (1) Side shield glasses
(2) Electrical Rubber Gloves
(3) Clamp-on amp meter

ATTENTION: Vital Step

CAUTION: Potential Hazard

JOB PROCEDURE:

1. Have owner's permission to do job.
2. Verify by nameplate and one-line diagram that starter to be load checked is correct.
3. Open cover on wire trough or conduit fittings.
4. Put on rubber gloves and carefully separate conductors to facilitate placing the amp meter on each conductor. Inspect insulation for any possible flaws.
5. Wearing rubber gloves, carefully place a clamp-on amp meter around one conductor at a time and note the readings.
6. When all three phases are read and noted, close the cover carefully and notify the owner that the job is complete.

NOTE:

ELECTRICAL RUBBER GLOVES REQUIRED ON 440 VOLT AND ABOVE

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ELECTRICAL CLEARING PROCEDURE #4

Area: LHC #7, B-7200

Scope of Work: Pulling or replacing 440 volt fuses in any 440 volt switchgear with disconnect ahead of fuses, including G.E. 7700 motor control center.

Hazards: (1) Flash and/or arcing
(2) Shock Hazard

Safety Equipment: (1) Hard hat and side shield glasses
(2) Electrical Rubber Gloves
(3) Approved Fuse Pullers
(4) Approved Voltage Tester

Remember: (1) Have owner's permission
(2) Use your I.R.S.

ATTENTION: Vital Step

CAUTION: Potential Hazard

RUBBER GLOVES MUST BE WORN WHEN TESTING 440 VOLT OR HIGHER

JOB PROCEDURE:

1. Have owner's permission to do job.
2. Verify on safety one line diagram and nameplates equipment to be worked on.
3. Check to be sure there is no load on gear.
4. Have owner open disconnect and Red Tag. Place your tag.
5. Open door and visually affirm disconnect is open ahead of fuses. Put on rubber gloves and check for voltage with approved tester. Check phase to phase and phase to ground on all three phases. (VOLTAGE TESTER MUST BE CHECKED ON KNOWN SOURCE BEFORE AND AFTER USE.)
6. Pull or replace fuses as needed. If replacing blown fuse, replace all three load fuses as the others are stressed and will give problems in future. If pulling fuses to clear, pull them all, including control fuses. Rubber gloves are optional if a visible air gap has been established before pulling fuses.

Electrical Clearing Procedure #4

7. If electrical work is required, a low voltage check list must be filled out at this time; then proceed with work.
8. After job is complete, remove Red Tag, complete low voltage check list, notify owner that you are finished.

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ELECTRICAL CLEARING PROCEDURE #5

Area: LHC #7, B-7200

Scope of Work: Work on 440 volt equipment protected by Thermal Circuit Breakers, except E.P.C. type starters on outside switch racks.

Hazards: (1) Flash and/or arcing
(2) Shock Hazard

Safety Equipment: (1) Hard hat and side shield glasses
(2) Electrical Rubber Gloves
(3) Approved Voltage Tester

Remember: (1) Have owner's permission
(2) Use your I.R.S.

ATTENTION: Vital Step

CAUTION: Potential Hazard

RUBBER GLOVES MUST BE WORN WHEN TESTING 440 VOLT OR HIGHER

JOB PROCEDURE:

1. Have owner's permission to do job.
2. Verify on safety one line diagram and nameplate equipment to be worked on.
3. Have owner turn off circuit breakers and tag. Place your tag over owner's. Open door to equipment.
4. Put on rubber gloves and check for voltage with approved tester. Check phases to phase, phase to ground on all phases.
(VOLTAGE TESTER MUST BE CHECKED ON KNOWN SOURCE BEFORE AND AFTER USE.)
5. If no voltage is present, remove load leads from starter or at the load and tape with electrical tape. Wear rubber gloves. Control leads may need to be disconnected also.
6. Fill out Low Voltage Safety Check List; proceed with work.
7. When job is complete, reverse Steps 5, 4 and 3; complete Low Voltage Safety Check List and notify owner you are finished.

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ELECTRICAL CLEARING PROCEDURE #6

Area: LHC #7, B-7200

Scope of Work: Removing and replacing starters and disconnect switches from 440 volt plug in load centers.

Hazards: (1) Flash and/or arcing
(2) Shock Hazard

Safety Equipment: (1) Hard hat and side shield glasses
(2) Electrical Rubber Gloves
(3) Flash suit and face shield
(4) Approved Voltage Tester
(5) Approved fuse pullers

Remember: (1) Have owner's permission
(2) Use your I.R.S.

ATTENTION: Vital Step

CAUTION: Potential Hazard

RUBBER GLOVES MUST BE WORN WHEN TESTING 440 VOLT OR HIGHER

A DOW ELECTRICAL FOREMAN MUST BE PRESENT

JOB PROCEDURE:

A. ID REMOVE:

1. Have owner's permission to do job.
2. Verify on safety one line diagram and nameplate equipment to be worked on.
3. Have owner open circuit breaker and hang Red Tag. Attach your tag over his.
4. Open door, check starter for open position. While wearing rubber gloves, check voltage, all three legs, phase to phase and phase to ground, at bottom of disconnect device with approved voltage tester.
(VOLTAGE TESTER MUST BE CHECKED ON KNOWN SOURCE BEFORE AND AFTER USE.)

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Electrical Clearing Procedure #6

5. While wearing rubber gloves, pull all fuses, load and control, clear auxiliary circuits and alarm circuits. Check with voltage tester.
 6. While wearing rubber gloves, lift and tape all leads that have to be disconnected to remove starter from cubicle.
 7. Fill out Low Voltage Safety Check List.
 8. Two men need to be present on job. One man in flash protection and electrical rubber gloves is to unplug starter or disconnect and remove it from M.C.C. A second man wearing electrical rubber gloves is to stand by for emergency action.
- B. To Reconnect:
1. Messer starter to be sure it is free from grounds.
 2. Work switch to be sure it is operating properly. Leave in open position and Red Tag.
 3. Two men need to be present on job. One man in flash protection and electrical rubber gloves is to plug in starter or disconnect. A second man, wearing electrical rubber gloves, is to stand by for emergency action.
 4. While wearing rubber gloves, check for voltage, phase to phase and phase to ground on all three legs, on load side of disconnect.
 5. Re-connect all leads to starter, replace fuses, close door.
 6. Complete Low Voltage Safety Check List, remove your Red Tag, notify owner that job is complete.

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ELECTRICAL CLEARING PROCEDURE #7

Area: LHC #7, B-7200

Scope of Work: Any work within 440 volt explosion proof combination motor starter (G.E. and Crouse-Hinds) other than energized incoming terminals.

Hazards: (1) Flash and/or arcing
(2) Shock Hazard

Safety Equipment: (1) Hard hat and side shield glasses
(2) Electrical Rubber Gloves
(3) Approved Voltage Tester

Remember: (1) Have owner's permission
(2) Use your I.R.S.

ATTENTION: Vital Step

CAUTION: Potential Hazard

RUBBER GLOVES MUST BE WORN WHEN TESTING 440 VOLT OR HIGHER

JOB PROCEDURE:

1. Have owner's permission to do job. Secure Safe Work Permit.
2. Verify on one-line diagram and nameplates equipment to be worked on.
3. Have owner open circuit breaker and hang Red Tag. Attach your tag over his.
4. Try to start motor as final check before removing cover.
5. Put on rubber gloves. Remove lower explosion proof cover only. Visually check starter for open position.
6. With gloves still on, check line side leads of starter (load side of breaker) for voltage with approved tester. (VOLTAGE TESTER MUST BE CHECKED ON KNOWN SOURCE BEFORE AND AFTER USE.) Be sure and check phase to phase and phase to ground on each of three lines. If no voltage present, remove load leads from starter or at the load, tape, remove gloves.
7. For any work inside of enclosure, rubber gloves must be used. NO work must be done on energized incoming line.

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ELECTRICAL CLEARING PROCEDURE #8

Area: LHC #7, B-7200

Scope of Work: Locating a ground on a 440 volt system using a resistance load pulsing to ground detector, and a clamp on amp meter.

Hazards: (1) Flash and/or arcing
(2) Shock Hazard

Safety Equipment: (1) Hard hat and side shield glasses
(2) Electrical Rubber Gloves
(3) Approved Voltage Tester
(4) Approved fuse pullers
(5) Barricade tape
(6) Flash suit and face shield

Remember: (1) Have owner's permission
(2) Use your I.R.S.
(3) This procedure requires an E.S.W.P.

ATTENTION: Vital Step

CAUTION: Potential Hazard

RUBBER GLOVES MUST BE WORN WHEN TESTING 440 VOLT OR HIGHER

JOB PROCEDURE:

1. Notify owner that they have a ground and get permission to work on it.
2. Find a 30 amp or smaller disconnect that can be taken out of service. If a 30 amp disconnect is not available, a 60 amp disconnect may be used IE a fuse reducer is used.
3. Open the door of the disconnect with it in the closed or on position.
4. While wearing rubber gloves, determine which phase is grounded by using an approved voltage tester. (VOLTAGE TESTER MUST BE CHECKED ON KNOWN SOURCE BEFORE AND AFTER USE.)
Check all three phases to ground the one that has very little or no voltage to ground is the grounded phase.
5. If there is no load on the disconnect, close door and turn disconnect to the "open" or "off" position. If the door must be left open when operating the disconnect, and it has a fused disconnect or an open type breaker, be sure there is no load. Wear flash suit and rubber gloves.

Electrical Clearing Procedure #8

6. While wearing rubber gloves, open door and check for voltage on the secondary side of the disconnect; using an approved voltage tester check phase to phase and phase to ground on all three phases. (VOLTAGE TESTER MUST BE CHECKED ON KNOWN SOURCE BEFORE AND AFTER USE.)
7. If there is no voltage, fuse one of the ungrounded leads as low as practical. If the disconnect is a breaker, it should not be over 15 amps.
8. Connect the pulsing resistor load to the small fuse. Make sure the resistor is rated 440 volts and it should not be over a 5 amp load.
9. Close the disconnect. Use rubber gloves and flash suit if disconnect has to be operated with the door open and has a fused disconnect or an open type breaker.
10. Do not leave the disconnect unguarded if the door has to be left open. Area should be taped off with yellow tape.
11. Find ground using clamp on amp meter.
12. Open disconnect. Wear flash suit and rubber gloves if door is open.
13. Check for voltage on the secondary side of disconnect with approved voltage tester. (VOLTAGE TESTER MUST BE CHECKED ON KNOWN SOURCE BEFORE AND AFTER USE.)
Check voltage phase to phase and phase to ground on all three phases. Wear rubber gloves.
14. If there is no voltage, remove ground detector lead and replace fuse to proper size.
15. Close door to disconnect and notify owner Job is complete.

LHC#7

ELECTRICAL CLEARING PROCEDURE #2

Area: LHC #7, B-7200

Scope of Work: Testing or adjusting time delay relays within 440 volt starters with fusible disconnects.

Hazards: (1) Flash and/or arcing
(2) Shock Hazard

Safety Equipment: (1) Hard hat and side shield glasses
(2) Electrical Rubber Gloves
(3) Approved fuse pullers

Remember: (1) Have owner's permission
(2) Use your I.R.S.

CAUTION: Potential Hazard

RUBBER GLOVES MUST BE WORN WHEN TESTING 440 VOLT OR HIGHER

JOB PROCEDURE:

1. Have owner's permission to do job.
2. Verify on one line diagram and nameplate equipment to be worked on.
3. Have owner de-energize equipment and tag.
4. Wearing rubber gloves, make all necessary voltage checks and fill out Low Voltage Check List.
5. Pull fuses by approved means. Rubber gloves optional.
6. Remove T-leads from enclosure and tape.
7. Re-fuse switch with 1 to 3 amp fuses using fuse reducers if necessary.
8. Adjust statostat to minimum time setting.
9. Wearing rubber gloves and flash suit, energize switchgear leaving door open for visual check.

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Electrical Clearing Procedure #2

10. Wearing rubber gloves, have operations switch units on and off adjusting stat between each operation until desired time is attained.
11. De-energize switchgear and make ready for service. Replace fuses with proper sizes. (Step #9)
12. Complete Low Voltage Check List and notify owner you are finished.

NOTE:

RUBBER GLOVES MUST BE WORN WHILE ADJUSTING RELAY. RED TAGS MUST BE REMOVED DURING INTERMITTENT OPERATION, IF POSSIBLE USE EXTERNAL 110 VOLT TO CONTROLS MAKING SURE THERE IS NO FEEDBACK TO CONTROL TRANSFORMER.

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ELECTRICAL CLEARING PROCEDURE #10

Area: LHC #7, B-7200

Scope of Work: Work on 110 volt control circuits of 440 volt switchgear, external of starter enclosure.
(Circuits from B-7201 Motor Control Center only)

Hazards: (1) Flash and/or arcing
(2) Shock Hazard

Safety Equipment: (1) Hard hat and side shield glasses
(2) Electrical Rubber Gloves
(3) Approved Voltage Tester

Remember: (1) Have owner's permission
(2) Use your I.R.S.

ATTENTION: Vital Step

CAUTION: Potential Hazard

RUBBER GLOVES MUST BE WORN WHEN TESTING 440 VOLTS OR HIGHER

JOB PROCEDURE:

1. Have owner's permission to do job.
2. Verify on Safety one line diagram and nameplate equipment to be worked on.
3. Have owner turn off circuit breaker or switch and tag. Place your tag over the owner's tag.
4. Before touching any conductor, check for voltage between wires and between each wire and ground. If no voltage is present, proceed with work.
5. When job is complete, remove red tag and notify owner.

LHC#7

ELECTRICAL CLEARING PROCEDURE #11

Area of work: Any work within 440 volt motor control center motor starter or disconnect other than energized incoming terminals.

Hazards: (1) Flash and/or arcing
(2) Shock Hazard

Safety Equipment: (1) Hard hat and side shield glasses
(2) Electrical Rubber Gloves
(3) Approved fuse pullers
(4) Approved Voltage Tester

Remember: (1) Have owner's permission
(2) Use your I.R.S.

ATTENTION: Vital Step

CAUTION: Potential Hazard

RUBBER GLOVES MUST BE WORN WHEN TESTING 440 VOLT OR HIGHER

JOB PROCEDURE:

1. Have owner's permission to do job.
2. Verify on safety one line diagram and nameplate equipment to be worked on.
3. Check to be sure there is no load on gear.
4. Have owner open disconnect and red tag. Place your tag.
5. Open door and visually affirm disconnect is open ahead of fuses. Put on rubber gloves and check for voltage with approved tester. (VOLTAGE TESTER MUST BE CHECKED ON KNOWN SOURCE BEFORE AND AFTER USE.)
Check phase to phase and phase to ground on all three phases.
Check all auxiliary circuits.
6. Wear rubber gloves to do work unless:
Line terminals are not exposed,
A visible air gap is at disconnect,
and, there are no energized auxiliary circuits.
7. No work must be done on energized incoming line.

LHC #7

Electrical Clearing Procedure #11

APPROVED AS REPETITIVE JOB:

By: J. T. Holloway
Phone 1651

Date

By: J. B. Jackson
Phone 7341

Date

By: W. L. Sims
Phone 2134

Date

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LHC #7 SAFETY RULES

- I. GENERAL
- II. HOUSEKEEPING
- III. PERSONNEL PROTECTIVE EQUIPMENT
- IV. SPILLS, GAS RELEASES, AND DISPOSAL
- V. EMERGENCY PROCEDURES
- VI. PERMISSIVE PROCEDURES
- VII. ROUTINE PROCEDURES

Updated 6/21/85

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I. GENERAL

1. Light Hydrocarbon #7 Safety Rules will not in any way void or restrict application of Texas Division Emergency Procedure, Texas Division Safety Rules, or Texas Division Safety Standards. Light Hydrocarbon #7 Safety Rules will supplement Division procedures, rules, standards.
2. All plant safety rules must be followed unless the plant Superintendent authorizes specific instructions.
3. All safe work procedures must be followed unless deviation is authorized by the Superintendent, Assistant Superintendent, or the Production Foreman.
4. It shall be the duty and responsibility of all personnel to report unsafe conditions to their supervisor.
5. All visitors to the operations area are to check in the office or control room before entering the operations area. Visitors that do not have a permanent Dow Pass will be escorted from and back to the main gate.

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II. HOUSEKEEPING

1. Good housekeeping is to prevail at all times. It is the responsibility of each employee to maintain his work area in a clean and orderly manner at all times.
2. Unsafe work areas left by others are to be reported to the supervisor at once.
3. Access to all safety emergency equipment must be kept open at all times, ie., safety shower - eyewash stations, fire extinguishers, monitor nozzles, etc.
4. Lids on all trash cans must be kept in place. Empty and full cans in the trash deuster bucket.
5. Gloves, rags, and trash must not be left on the ground. Trash cans with lids, dirty glove laundry bags are provided for disposal and collection of this material.
6. Oil spills must be cleaned up immediately to prevent slip hazards and housekeeping problems.
7. Stairways and passageways are to be kept free and clear of obstructions and walking surface kept free of a slippery condition.
8. All service hoses must be stored on racks or coiled in an orderly manner when not in use.
9. All ladders not in use must be stored on racks or in an orderly manner in places where they do not constitute a hazard.
10. Personal lockers must be kept in a clean and orderly manner. Volatile substances, oily rags, or dirty gloves must not be stored in lockers.
11. Keep soft drink cans, cigarette butts, and trash in the proper containers.
12. Soft drink cans and coffee cups are not to be taken into the plant area; they are to remain in the building.

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III. PERSONNEL PROTECTIVE EQUIPMENT

1. The minimum eye protection requirements for Light Hydrocarbon #7 will be as follows:
 - A. All employees during working hours will wear side shield safety glasses as a minimum. Exceptions - eye protection will not be required for office areas, assembly rooms, designated lunch or change rooms, inside the cab of motor vehicles, walking to or from work utilizing designated streets and walkways, or operating areas in front of panel boards in control room.
 - B. Contact lenses must not be worn in the plant without prior approval of the Industrial Medicine Department and Plant Superintendent.
2. Approved hard hats must be worn (as designed) in all work areas outside of B-7201 and B-7202. Hard hats are required inside buildings when overhead work is being done.
3. Each employee must be sure that the personnel protection equipment is clean and in good condition before it is used. Safety side shield glasses and chemical goggles must be clean and well fitted. Hard hats must have proper head support and be well fitted. Face shields must be clean and properly fastened to the head seat.
4. Chemical goggle areas will be clearly designated by signs and/or roped off areas and everyone without exception must wear chemical goggles in such areas.
5. Special Jobs requiring eye protection beyond the minimum are as follows:
 - A. Obtaining samples of any liquid or gaseous process materials under high pressures such as: liquid ethylene, propylene, ethane, cracked gas streams, etc., chemical goggles will be required.
 - B. When performing draining, unplugging, purging or any similar type of operation on process piping or equipment in which any of the above materials could be released either intentionally or accidentally to the atmosphere, it will be required that chemical goggles be worn. Depressurizing of lines or equipment to atmosphere is included in this rule.
 - C. In addition, any experimental or other handling of any chemicals, solvents, acids or basic materials will require chemical goggles as a minimum and face shield additional if so directed by the pertinent job procedure or by supervision.

6. Approved hearing protection must be worn in all process areas.
7. All safety and eyewash stations shall be tested at least once per week.
8. Flashhood, flash jacket and flame retardant gloves must be worn when lighting F-1 thru F-9. This applies to H-1A and H-1B if the automatic ignition is not operable and they must be ignited by hand held torch.
9. Each employee shall be familiar with the location and use of the fire extinguishers, gas masks, eyewash - safety showers, sprinkler system, monitor nozzles, and other emergency equipment in his work area. Anyone using any emergency equipment must report this promptly to his supervisor.
10. All flare line entries shall require the wearing of flash jacket, flash hood and gloves. Flare line entries require a standby person.
11. Flash hood, flash jacket, and flame retardant gloves must be worn when operating all 2300 volt switchgear and all 440 volt switchgear which is fused for 60 amps or more.
12. A face shield, slicker suit, and rubber boots must be worn when opening lines or equipment where hot materials may be encountered.
13. An acid hood, slicker suit, rubber boots and rubber gloves must be worn when opening (breaking into) an acid, caustic, or MEA line.

IV. SPILLS, GAS RELEASES, AND DISPOSAL

1. No flammable liquid will be drained to the ground. They must be drained to the blowdown system, oily water sewer or caught in a container and then emptied into an appropriate system.
2. No flammable gas will be released to the atmosphere where provisions can be made to get it into the flare system.
3. Whenever any line or equipment is blocked in, adequate steps must be taken to prevent the buildup of excessive pressure. This will usually involve draining the equipment, or at least leaving a large vapor space and preventing an increase in temperature.
4. No manual drain valves on vessels or pipes containing hydrocarbons shall be left open and unattended unless specified by written instructions from a supervisor.
5. No vessel or pipe vent that contains hydrocarbons shall be left open and unattended while venting to the atmosphere unless specified by written instructions from a supervisor.
6. All normally closed bleeders must be flagged with yellow plastic tags when they are left in the open position.
7. Every effort will be made to prevent air from getting into the flare line.
8. Pyrophoric materials that are spilled on the ground must be kept wet with water spray until it is removed from the block.
9. Polymer from towers, exchangers, drums or other equipment shall be kept wet at all times to eliminate the possibility of spontaneous combustion. Polymer which has been removed from process equipment shall be collected in a water-tight box or container and stored under water until it has been disposed of. Polymer remaining inside of the equipment shall be saturated with water until it has been removed.
10. The normal position of a "Hamer" blind in the flare system is in the "Open" position. The switching of these blinds from the open to close position and from the closed to the open position requires the notification of operating personnel that the flare will be open. The person opening the flare line must confirm the flare is not in use. The person turning the Hamer blind shall wear flash jacket, hood and gloves. A second person must be present and monitor the flare line entry and provide backup in case of trouble. Any problems such as a non-operable Hamer blind, unusual liquids, or any unusual problems shall be communicated to the proper supervision.

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V. EMERGENCY PROCEDURES

1. All employees must be familiar with the Unit Emergency Plan for each area and how to put this plan into effect.
2. Employees must be familiar with the emergency horn signals and sound the appropriate signal when the following conditions exist.

A. Gas Release

The gas release horn will be sounded when a hydrocarbon release occurs within the plant area that may cause injury to personnel or equipment. When in doubt, sound the gas release signal, then dial 46666 and report the emergency. NOIEI If the gas release is in another block see Alert.

B. Alert

The alert signal will be sounded when a hazardous gas release occurs in an adjacent block and wind direction is such that personnel may be exposed to hazardous gases downwind of the release.

C. Evacuate

The evacuation signal will be sounded when a hazardous condition exists within the plant area which jeopardizes the safety of operating and maintenance personnel. The signal should be sounded by the supervisor in charge or in his absence the senior control operator.

D. All Clear

The all clear must not be sounded until the all clear has been sounded in the originating block, or so directed by the superintendent or his alternate.

When a true emergency occurs that requires sounding the emergency signal, the man on call is to be notified. The man on call is to notify the superintendent or his alternate. When an emergency signal is sounded inadvertently or for a non-routine test, the plant office and Plant Protection (2112) are to be notified.

3. The emergency horn must be kept operative as much as possible. When it is out of order notice must be posted in the control room as to its condition.

4. Any message received on the telephone seizure system must be relayed to supervision at once. No phone in the office is connected to the seizure system. Since the phone seizure comes in at the recovery end desk, the person answering the phone (usually the Recovery Control A Operator) may need to take immediate action for the protection of himself and others in the block. This will have to be a judgment made based on the nature of the message. If time permits, the shift foreman or other supervisor should be notified for a decision, but time may be critical.
5. The safety shower system must be kept operative as much as possible. When it is out of order, notice must be posted in the control room as to its condition.
6. Any signal other than a test from the emergency horn cancels all safe work permits. They must be authorized in writing to proceed after the emergency 'All Clear' has sounded. This may be done by resigning the original permit with the new time indicated or by filling out a new permit.
7. Be especially aware of non-departmental personnel working in this block. Be sure they understand and abide by these emergency procedures.

VI. PERMISSIVE PROCEDURES

1. Safe Work Permits: are required from production personnel for all work in the process area involving:
 - A. Spark or flame producing apparatus.
 - B. Concrete chipping.
 - C. Open type electric motors.
 - D. Operation of motor or bridge crane.
 - E. Entry into closed vessels or process lines.
 - F. Entry into an electrical enclosure in the Class I, Division I (explosion proof) area or for the use of adapters which changes any electrical classification.
2. Area Permits: are required from production personnel for any work in the process area not covered by a Safe Work Permit.
3. Safe Work Permits and Area Permits:
 - A. All permits shall be logged in the permit status book.
 - B. All permits shall be returned to production personnel at the completion of the job, or when work is stopped at the end of the day, or when work crews change on the job. The returned permit shall have the date, time, and status entered in the location labeled "Returned".
 - C. All permits must be filed in the permit file for a period of time to be determined by the Production Superintendent.
4. Permission must be obtained from a production supervisor or the operator responsible for the area in writing (or escorted in and out) before vehicles may enter restricted area. (ICE permit). The person issuing the permit must confirm by site visit that the area is safe.
5. Smoking is allowed only in the following places:
B-7201, B-7201 A, B-7202, B-7205, B-7207
(IN B-7202, SMOKING IS PROHIBITED ON THE STAIRWAY AND AREA ABOVE OFFICE, LUNCHROOM, CHANGE ROOM.)
6. "Strike Anywhere" matches are not permitted in the area. Only safety matches or lighters are acceptable.
7. All welding flint lighters will be disengaged when not in use.
8. All Safe Work Permits must be displayed at the safety center in the control room.
9. All "visitors" to the plant must check in at the control room or office at B-7201.

VII. ROUTINE PROCEDURES

1. Production red tags that are removed must be completed and disposed of in the Shift Foremen's office. Any red tag found not attached to equipment must be given to the Shift Foreman immediately.

Maintenance red tags that are removed must be completed and given to the Maintenance Foreman for disposal. Any red tag found not attached to equipment must be given to the Shift Foreman immediately.

If maintenance pulls their red tags before a job is completely finished, then a green warning must be attached stating what has not been completed.

2. All road entrance barricades must be in place when they are not attended. No vehicles are to proceed past road barricades without written permission (I.C.E. permit) or escort.
3. Safety chains across openings must be in place when employees are on such platforms.
4. Blowing down pumps, lines, and vessels to the atmosphere will be kept to a minimum and only under close supervision. Bleeds left in the open position must be flagged with yellow plastic tags.
5. Hydrocarbon samples (sample bombs) are not to be brought into B-7201, B-7202, or B-7203 under any conditions.
6. No liquid hydrocarbons will be drained to the slab or outside block limits piping (OSBL) where it would get into plant surface drainage system.
7. In case of any chemical spill supervision is to be notified immediately. The spill is to be contained and cleaned up as soon as possible. If the spill contaminates an off site ditch, the Superintendent or person on call must be notified.
8. All grounding connections will be made secure prior to connecting lines for loading and unloading containers and will remain connected until lines have been removed.
9. Chipping concrete will be done with area flooded with water at all times during the chipping operation. A Safe Work Permit is required.

10. Flashlights used in the process area must bear the Underwriters Laboratory approval and be in good condition.
11. All guards and safety devices must be in place and operative before any equipment is operated.
12. All service hose connections will be identified near the valve as to the contents of the line.
13. Snap-on fittings will not be used to connect hoses to piping containing hazardous materials such as hot water, steam, caustic, or flammable material.
14. Steam and hot water hoses will not be used in services whose pressures can exceed 70 psig.
15. All step ladders must be on stable footing before being used and in no case will anyone stand on the top step. Step ladders of 12 feet or taller will require the use of a safety belt or safety harness properly tied off.
16. All straight ladders must be held in place by an attendant or tied off within three rungs of the top so the ladder will not fall before it is mounted.
17. Floor grating or plates not in place and excavations must be barricaded or identified with yellow plastic tubing.
18. All extension ladders shall have one of the lower rungs of the upper section fastened securely to the adjacent rung of the lower section to prevent disengagement of the dogs. This material should be rope, or wire, compatible with conditions in the area.
19. Any work more than three feet above the ground or floor, which cannot be accomplished from a platform, scaffold, ladder, must have prior approval of supervision.

Maintenance personnel may obtain approval from their foreman, planner, or production superintendent. In the case of operators and instrument men, this approval will be obtained from production supervision.

As with all policies, there needs to be a provision for exception. In a dire emergency where it is necessary to take immediate action to protect life or property, it will be permissible to proceed as necessary, reporting the problem to supervision as soon as possible.

20. Work inside or near an opening to the cooling tower basin requires a Safe Work Permit. A life jacket must be worn.

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PURIFICATION AREA HURRICANE
PREPAREDNESS LETTER

MAR 28 1988
J.T. ADAMS

IN THE EVENT THAT WE FEEL THE FULL FORCE OF HURRICANE DANNY THIS EVENING, THE FOLLOWING JOBS SHOULD BE ACCOMPLISHED BEFORE SHIFT CHANGE THIS EVENING:

1. ALL FIRE EXTINGUISHERS IN THE PURIFICATION AREA, THAT IS FROM THE COLD TRAIN THROUGH C-152 AND K-120 AND K-130, SHOULD BE TIED SECURELY TO THEIR SUPPORT BEAMS. THIS ALSO INCLUDES THE ROLL AROUND TYPE MONITOR GUNS.
2. WIRE ALL STEP LADDERS DOWN.
3. MAKE A CAREFUL INSPECTION OF THE AREA TO BE SURE THAT NO OBJECTS EXIST THAT COULD BE PICKED UP BY THE WIND AND CAUSE DAMAGE TO ANY EQUIPMENT. IF SO, TIE THEM DOWN OR POSITION THEM SO THEY DON'T PRESENT A HAZARD.

IN THE EVENT OF A HURRICANE, WITH WIND GUSTS ABOVE 98 MPH OR SUSTAINED WINDS OF 75 MPH, IT WILL BE NECESSARY TO SHUT THE PLANT DOWN AND SECURE IT SO THAT NO PERSONEL ARE REQUIRED TO VENTURE OUTSIDE. THE FOLLOWING GUIDELINES SHOULD BE FOLLOWED FOR THE AREAS INCLUDING THE PROPYLENE AND ETHYLENE REFRIGERATION MACHINES, THE COLD TRAIN, C51, C52, THE REACTOR AREA, C150, C151, AND C152:

1. DECREASE THE LOADING ON BOTH GAS TURBINES TRYING TO BACK THE COMPRESSOR BACK TO MOP BEFORE ACTUALLY TRIPPING THE MACHINE.
2. AFTER TRIPPING THE TURBINES, SPIN FOR 5 HOURS AND PUT ON TURNING GEAR MAKING SURE THAT THE T7 AVERAGE OR AVERAGE BASKET TEMPERATURES ARE BELOW 100 DEGREES CENTIGRADE. RUN ON TURNING GEAR FOR AS LONG AS POSSIBLE, THEN SHUTDOWN AND CUT THE LUBE OIL SYSTEMS OFF. WATCH THE TURBINE BEARING TEMPERATURES FOR A SHORT TIME AFTER SHUTTING THE OIL OFF TO BE SURE THAT THEY DO NOT OVERHEAT. BE SURE THAT ALL STEAM TO THE HELPER TURBINES IS BLOCKED IN BEFORE SHUTTING THE LUBE OIL SYSTEMS DOWN.
3. EQUALIZING OF ECONOMIZER LEVELS SHOULD BE DONE BEFORE SHUTTING DOWN THE PROPYLENE MACHINE. IF P-124 IS NEEDED, USE IT TO GET LEVELS TO AN OPTIMUM POINT. CHECK ALL PROPYLENE EXCHANGERS BOILING OUT AS MUCH PROPYLENE BEFOREHAND AS POSSIBLE. WHEN EACH IS SECURE, CLOSE A BLOCK VALVE AT EACH CONTROL STATION SUPPLYING PROPYLENE TO EACH EXCHANGER. WATCH THE PRESSURES IN EACH ECONOMIZER. THE PROPYLENE SYSTEM HAS SEVERAL LEAKING POSISEAL VALVES.
4. THE ETHYLENE MACHINE SHOULD BE BROUGHT DOWN AFTER K-120. MAKE SURE THAT THE UNIT IS SLOW ROLLED FOR A MINIMUM OF 1 HOUR BEFORE BRINGING IT TO A STOP. AGAIN CUT OFF LUBE OIL, BUT BE SURE TO WATCH BEARING TEMPERATURES. DO NOT KEEP THE TURBINE CASE ON TK-130 HOT. CUT OFF ALL STEAM. REMOVE LEVELS IN ALL ETHYLENE EXCHANGERS AND BLOCK IN THE CONTROL STATIONS. WATCH PRESSURES IN THE ETHYLENE DRUMS.

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5. THE COLD TRAIN SHOULD BE ISOLATED BY CLOSING THE BLOCK VALVE ON THE OUTLET OF S-40A/B. THE C51 BOTTOMS LEVEL SHOULD BE BROUGHT DOWN TO A MINIMUM BEFORE K-120 IS TRIPPED. THE COLD TRAIN DRUM LEVELS SHOULD BE LOWERED AND VAPOR BLOWN THROUGH EACH DRUM BACK TO C-51 BEFORE THE PLANT IS TRIPPED. THIS WILL MINIMIZE THE LIQUID IN THE SYSTEM. WHEN OVERHEAD FLOW DROPS OFF, SHUT DOWN THE TURBOEXPANDERS AND BLOCK IN THE LUBE OIL SYSTEM. PRESSURE CONTROL THE OVERHEAD OF C-51 THROUGH THE JOULE THOMPSON VALVE. FINALLY, BLOCK IN THE LEVEL CONTROLLERS OUT OF THE D-50S.
6. BEFORE K-120 IS TRIPPED, LOWER THE C52 BOTTOMS LEVEL TO A MINIMUM MAKING SURE THAT C2S ARE HELD IN SPEC. WHEN MINIMIZED, BLOCK IN THE BOTTOMS OUT AND STEAM TO THE REBOILER. FINALLY SHUT DOWN THE REFLUX PUMPS.
7. CLOSE FIC 1819 TO THE REACTORS AND BLOCK IN THE INLET AND OUTLET OF BOTH C150S. MAKE SURE THAT THE HYDROGEN TO THE REACTORS IS BLOCKED IN AND THAT THE REACTORS HAVE BEEN TRIPPED. MAKE SURE THAT THE BYPASS OUT OF THE SPARE C-150 IS CLOSED. BLOCK IN THE C150 BED PURGE TO C20 AND LEVEL CONTROLLERS ON THE KNOCKOUT DRUMS S140,141,142 TO C20.
8. AS THE PLANT IS BEING BROUGHT DOWN, TRANSFER THE BOTTOMS LEVEL OF C151 TO C152. LINE UP THE OVERHEAD OF C-151 TO FUEL GAS AND PRESSURE CONTROL TO THAT HEADER. WATCH THE METHANE IN C-152 OVERHEAD. WHEN LEVEL IS MINIMIZED, BLOCK IN THE BOTTOMS OUT OF C-151. BLOCK IN THE PROPYLENE OUT OF THE REBOILER AND SHUT DOWN THE REFLUX PUMPS.
9. LEVELS IN C-152 SHOULD BE MINIMIZED BEFORE SHUTTING DOWN THE PLANT. THE OVERHEAD MATERIAL SHOULD BE LINED UP TO VINYL AND SENT OUT UNTIL THE MATERIAL SPEC IS EXCEEDED. BE SURE TO COMMUNICATE WITH VINYL. LINE UP THE DISTRIBUTION SYSTEM SO THAT THE OVERHEAD OF C-152 GOES TO FLARE. WE CAN PRESSURE CONTROL AT THIS POINT. THE REBOILER PROPYLENE FLOW SHOULD BE BLOCKED IN AT THE REBOILER OUTLET AFTER K-120 IS TRIPPED, AND THE REFLUX PUMP SHOULD BE SHUT DOWN.

THIS IS A BRIEF OVERVIEW OF HOW THE PLANT SHOULD BE LINED UP DURING MAXIMUM HURRICANE CONDITIONS. ANY QUESTIONS REGARDING SPECIFIC LINEUP OR VALVE STATUS SHOULD BE ANSWERED BY THE SUPERVISOR OR AREA ENGINEER.

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