

R. R. RIPLEY

KNOW YOUR EMERGENCY NUMBER

DIAL 2212

FOR

FIRE AND AMBULANCE

2212 INITIATES QUICK EMERGENCY PROCEDURES
TO CARE FOR SERIOUS INJURIES, SUDDEN ILL-
NESS AND PROMPT CONTROL OF FIRES.

RECOMMENDED PROCEDURES FOR MEDICAL EMERGENCIES

1. DIAL 2212 FOR AMBULANCE.
2. GIVE THE GUARD OR MEDICAL ATTENDANT THE
EXACT LOCATION OF THE INJURED EMPLOYEE.
3. TELL THE GUARD OR MEDICAL ATTENDANT WHAT
TYPE OF INJURY OR ACCIDENT THE EMPLOYEE
SUFFERED (FALL, ELECTRICAL SHOCK,
CHEMICAL BURN, ETC.).
4. DO NOT MOVE INJURED UNLESS THERE IS
DANGER OF FURTHER INJURY TO THE PERSON.
5. GIVE MOUTH TO MOUTH RESUSCITATION IF
NEEDED.
6. CONTROL SEVERE BLEEDING WITH DIRECT
PRESSURE TO THE WOUND.
7. KEEP INJURED LYING DOWN IF POSSIBLE AND
PROVIDE COMFORT.
8. CLEAR IMMEDIATE AREA TO ASSIST AMBULANCE
IN REACHING AREA.

PLAINTIFF'S
EXHIBIT
AL-1636

APC 005403

POINT COMFORT OPERATIONS SAFETY POLICY

IT IS ALCOA'S POINT COMFORT OPERATIONS POLICY TO CONDUCT ALL OF ITS ACTIVITIES IN A SAFE MANNER TO PREVENT INJURIES TO PERSONS AND DAMAGE TO PROPERTY AND EQUIPMENT. ALL INJURIES CAN BE PREVENTED. NO TASK SHALL BE UNDERTAKEN UNTIL ADEQUATE SAFEGUARDS HAVE BEEN PROVIDED TO PROTECT EVERY INVOLVED EMPLOYEE FROM INJURY DUE TO RECOGNIZED HAZARDS. ALL EMPLOYEES HAVE THE RESPONSIBILITY FOR SAFETY OF THEMSELVES AND OTHERS. WHERE IT IS NOT REASONABLE OR PRACTICAL TO ELIMINATE THE SOURCES OF DANGER, MEASURES MUST BE TAKEN TO USE SAFE PROCEDURES, GUARDS, SAFETY DEVICES AND PROTECTIVE CLOTHING. NO MATTER WHAT THE EXPOSURE, AN EFFECTIVE SAFEGUARD CAN BE PROVIDED.

THE LINE ORGANIZATION HAS THE RESPONSIBILITY FOR EVERY OPERATIONAL ACTIVITY OF THE COMPANY. EACH SUPERVISOR MUST ACCEPT THE RESPONSIBILITY FOR THE SAFETY OF THE EMPLOYEES.

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SAFETY CODE OF CONDUCT

1. SET A GOOD EXAMPLE.
 - A. OBSERVE ALL SAFETY RULES.
 - B. WEAR PERSONAL PROTECTIVE EQUIPMENT WHERE REQUIRED.
 - C. DISCUSS SOME ASPECT OF SAFETY WITH FELLOW EMPLOYEES EVERY DAY.
 - D. BE ENTHUSIASTIC ABOUT SAFETY.
 - E. GIVE SAFETY PRIORITY AMONG YOUR PROBLEMS.
2. KNOW YOUR JOB.
 - A. KNOW THE JOB SAFETY ANALYSIS OR TOOL & EQUIPMENT PROCEDURES OF EACH JOB YOU ARE REQUIRED TO DO.
 - D. KNOW THE OPERATING INSTRUCTIONS.
3. TAKE TIME TO EVALUATE THE POSSIBLE HAZARDS BEFORE BEGINNING ANY JOB.
4. INSTRUCT OR GUIDE FELLOW EMPLOYEES TOWARD SAFE WORK HABITS.
5. CORRECT UNSAFE ACTS IMMEDIATELY EVEN IF IT REQUIRES STOPPING THE JOB.
6. BE ALERT FOR UNSAFE CONDITIONS AND REPORT THEM IMMEDIATELY TO YOUR SUPERVISOR.

APC 005405

7. MAINTAIN GOOD HOUSEKEEPING.

- A. WHEN COMPLETING A JOB OR A SHIFT,
LEAVE THE AREA IN A NEAT AND ORDERLY
FASHION.

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PLEASE COMPLETE THIS PAGE AS YOU ADD REVISIONS
TO YOUR POINT COMFORT OPERATIONS RULES BOOK.

DATE OF REVISION	PAGE #	SUBJECT MATTER
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11/21/79	5	WORK RULES
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11/21/79	15	NYLON CLOTHING IN POT- ROOMS, & INGOT PLANTS
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11/21/79	AF-2	BLUE FLAG RULE
01/16/80	9	BARRICADE TAPE
01/16/80	10	BARRICADE TAPE
01/16/80	10A	MISCELLANEOUS
01/16/80	33,34	DIGESTION DEPT. RULES
01/16/80	35,36	PRECIPITATION DEPT. RULES
01/16/80	AF-3	TRACKMOBILE RULE 9
03/05/80	15	RIDING OF TWO-WHEEL BICYCLES NOT PERMITTED IN ALL COVERED STRUCTURES IN THE SMELTING PROD. AREA
03/05/80	29	RIDING OF BICYCLES OR TRICYCLES IN ALUMINA PLANT
03/05/80	29	LOCKING PINS, CLIPS, OR SNAG FREE WIRES

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OPERATIONS GENERAL SAFETY RULES

A SAFETY RULE, FOR THE MOST PART, IS COMMON SENSE APPLIED TO WORKING HABITS. IT IS IMPOSSIBLE TO LIST A RULE COVERING EVERY SITUATION, BUT BELOW ARE SAFETY RULES WHICH APPLY TO ALL EMPLOYEES AT ALL TIMES.

A. APPAREL

WHEREVER NEEDED, PERSONAL PROTECTIVE EQUIPMENT AND SPECIAL CLOTHING SHOULD BE AVAILABLE TO EMPLOYEES FOR PROTECTION AGAINST HAZARDS THAT CANNOT BE ELIMINATED OR ADEQUATELY GUARDED.

1. APPROVED SAFETY GLASSES, SAFETY HATS, AND SAFETY TOE SHOES MUST BE WORN WHILE INSIDE THE PLANT FENCE WITH THE FOLLOWING EXCEPTIONS:

A. WALKING IN NON-WORK AREAS WHEN ENTERING OR LEAVING THE PLANT, ON THE WAY TO OR FROM PARKING LOTS TO LOCKER ROOMS OR PLANT OFFICES.

B. RIDING IN AN ENCLOSED VEHICLE, SUCH AS A PASSENGER CAR OR TRUCK CAB WITH THE FOLLOWING EXCEPTION:

(1) IF THE WINDOWS ARE NOT FULLY CLOSED, SAFETY GLASSES ARE REQUIRED.

C. IN OFFICES, LUNCHROOMS AND ENCLOSED CONTROL ROOMS UNLESS PERFORMING WORK ON EQUIPMENT.

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- D. CONTACT LENSES CANNOT BE WORN IN LIEU OF PRESCRIPTION SAFETY GLASSES UNLESS SPECIFICALLY APPROVED BY THE PLANT PHYSICIAN. GOGGLES MUST BE WORN BY APPROVED CONTACT LENS WEARERS IN OPERATIONAL AREAS.
 - E. VISITORS NEED NOT WEAR SAFETY TOE SHOES IF ACCOMPANIED BY AN EMPLOYEE ACTING AS A RESPONSIBLE GUIDE.
 - F. BUMP HATS ARE APPROVED SAFETY HATS IN BUILDING R-111, BUILDING 37, AND FOR MACHINE SHOP PERSONNEL IN R148.
 - G. SAFETY TOE SHOES ARE NOT REQUIRED FOR OFFICE WORKERS PROVIDING THEY ARE NOT REQUIRED TO WALK THROUGH OPERATIONAL AREAS OF THE PLANT.
- 2. RUBBER GLOVES AND MONOGOGGLES MUST BE WORN WHEN HANDLING ALL HAZARDOUS CHEMICALS. TYPICAL EXAMPLES INCLUDE HYDROCHLORIC ACID, SULFURIC ACID, CAUSTIC, AND CARBONTETRACHLORIDE.
 - 3. WORKING WITHOUT WEARING A SHIRT IS PROHIBITED.

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4. FINGER RINGS MUST NOT BE WORN; GUIDED WALK-THROUGH VISITORS AND EMPLOYEES WORKING IN OFFICES ARE EXCEPTED.
5. DARK GLASSES SHALL NOT BE WORN INSIDE COVERED OR ENCLOSED STRUCTURES, EXCEPTIONS AREA R-51 AND R-55 DURING DAYLIGHT HOURS ONLY; WHILE DIRECTLY PERFORMING OR ASSISTING DURING A WELDING, CUTTING, FURNACE TENDING OR BLACKSMITH OPERATION, AND MAY BE WORN AT ALL TIMES FROM THE CENTER AISLE NORTH THROUGH THE WELDING AREA IN R-148. WHEN ON FOOT, DARK GLASSES MAY BE WORN IN AND OUT OF LIGHTED MAINTENANCE SHOPS FOR NON EXPOSURE ACTIVITIES INCLUDING BUT NOT LIMITED TO THINGS SUCH AS GETTING A DRINK, GOING TO AND FROM LUNCHROOM OR SUPERVISOR'S OFFICE AND PICKING UP A TOOL.
- B. OPERATING MACHINERY OR VEHICLES
 1. OPERATE ONLY VEHICLES OR EQUIPMENT THAT YOU ARE AUTHORIZED TO OPERATE AS PART OF YOUR JOB.
 2. IN-PLANT VEHICLE SPEED IS 15 M.P.H., UNLESS OTHERWISE POSTED.
 3. SEAT BELTS MUST BE WORN BY THE OPERATOR AND PASSENGERS OF ALL VEHICLES, WHERE THEY ARE PROVIDED, WHILE DRIVING ON COMPANY BUSINESS WHEN OPERATED OUTSIDE THE PLANT PERIMETER FENCE. SEAT BELTS MUST BE WORN IN ANY VEHICLE OR PIECE OF EQUIPMENT AS REQUIRED BY ITS JSA/ESA.
 4. DO NOT DRIVE OR OPERATE A VEHICLE OR PIECE OF EQUIPMENT THAT HAS ANY KNOWN DEFECT THAT WILL AFFECT SAFE OPERATION.

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5. RIDERS ARE PERMITTED ON VEHICLES AND EQUIPMENT ONLY WHEN A SEAT IS PROVIDED SPECIFICALLY FOR THE PURPOSE OF RIDING. OBEY ALL PERSON LOAD LIMITS POSTED ON VEHICLES. THE VEHICLE OR EQUIPMENT OPERATOR IS TOTALLY RESPONSIBLE FOR COMPLIANCE WITH ALL RULES AND REGULATIONS INVOLVING THE PASSENGERS, VEHICLE OR EQUIPMENT.
6. MOBILE EQUIPMENT OR VEHICLES REQUIRING AN OPERATOR SHALL NOT BE LEFT WITH THE ENGINE RUNNING WHEN VACATING THE POSITION WHERE THE OPERATING CONTROLS ARE LOCATED. THE EXCEPTIONS ARE EMERGENCY VEHICLES, EQUIPMENT THAT REQUIRES THE ENGINE TO BE RUNNING IN ORDER TO MAKE REPAIRS, INSPECTIONS, OR MAINTENANCE, AND THAT EQUIPMENT WHOSE AUXILIARY FUNCTIONS (SUCH AS PUMPS, OUTRIGGERS, ETC.) DERIVE THEIR POWER FROM THE MAIN ENGINE DRIVE BUT ARE CONTROLLED FROM OUTSIDE THE OPERATOR'S CAB. SPECIFIC INSTRUCTIONS FOR EQUIPMENT WHICH REQUIRES THE OPERATOR TO BE OUTSIDE THE CAB WILL BE EXPLAINED IN THE APPLICABLE JSA OR ESA.
7. ALL VEHICLES MUST HAVE LIGHTS ON INSIDE BUILDINGS AT ALL TIMES WHILE OPERATING.
8. WHEN LOADING OR UNLOADING TRACTOR TRAILER EQUIPMENT THE TRACTOR UNIT (CAB) MUST BE UNDER THE TRAILER WITH 5TH WHEEL COUPLING ENGAGED AND AIR BRAKES APPLIED. EXCEPTION: IF DUE TO UNUSUAL CIRCUMSTANCES A TRAILER IS TO BE UNLOADED OR LOADED WITHOUT A TRACTOR UNIT IN PLACE, WHEELS MUST BE CHOCKED TO

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PREVENT ROLLING AND SUPPORT JACKS PLACED UNDER THE LOAD BEARING MEMBER IN THE FRONT OF THE TRAILER. IF A FORK LIFT IS TO BE DRIVEN ONTO THE TRAILER, A TIE DOWN DEVICE FROM THE 5TH WHEEL COUPLING POINT MUST BE SECURED TO PREVENT TIPPING.

9. DO NOT MOVE ANY RAIL CAR WITH ANY VEHICLE THAT DOES NOT HAVE A COUPLING DEVICE FOR FIXED ATTACHMENT TO THE CAR.

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C. WORK RULES

1. SAFETY BELTS MUST BE WORN WHEN WORKING 8' OR MORE ABOVE GROUND OR FLOOR LEVEL UNLESS YOU ARE PROTECTED BY STANDARD HANDRAILS OR SPECIFICALLY EXCEPTED BY DEPARTMENTAL RULES.
2. DO NOT OPERATE ANY EQUIPMENT UNLESS ALL SAFETY GUARDS ARE IN PLACE AND WORKING PROPERLY.
3. INSPECT ALL TOOLS AND EQUIPMENT BEFORE USE AND REPORT ALL UNSAFE CONDITIONS IMMEDIATELY TO YOUR SUPERVISOR. ANY EQUIPMENT OR TOOLS REQUIRING DEFINITE SCHEDULED PERIODIC INSPECTION MUST HAVE THE PROPER IDENTIFICATION BEFORE USING SAME. REFER TO APPENDIX AA LISTING EQUIPMENT AND TOOLS REQUIRING SCHEDULED PERIODIC INSPECTIONS AND THE REQUIRED INSPECTION FREQUENCY.
4. PORTABLE METAL LADDERS ARE PROHIBITED IN THE PLANT. EXCEPTIONS: POTROOM POT LADDERS, LADDERS IN Q15 AND P-16 TUNNELS; AND LADDERS ON R-10 AND R-52 DOCKS.
5. DANGER TAG AND LOCK OUT PROCEDURES MUST BE FOLLOWED. (REFER TO APPENDIX AB).
6. POINT COMFORT STANDARD FOR ENTERING TANKS AND CONFINED SPACES MUST BE FOLLOWED. REFER TO APPENDIX AC.
7. WELDING AND BURNING PERMIT PROCEDURES MUST BE FOLLOWED. REFER TO APPENDIX AD.

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8. DO NOT GO UNDER, BETWEEN OR OVER ANY RAILROAD CARS OR OTHER VEHICLES WHEN COUPLED TOGETHER, WHETHER MOVING OR STATIONARY. THE EXCEPTIONS ARE REQUIRED WORK ASSIGNMENTS.
9. THE USE OF COMPRESSED AIR FOR PERSONNEL CLEANING IS PROHIBITED.
10. THE JOB SAFETY ANALYSIS OR TOOL AND SAFETY EQUIPMENT PROCEDURES MUST BE UNDERSTOOD AND FOLLOWED WHILE PERFORMING ANY JOB. IF A JOB SAFETY ANALYSIS OR TOOL AND SAFETY EQUIPMENT PROCEDURE IS NOT AVAILABLE, BE SURE THAT ALL APPLICABLE SAFE PROCEDURES ARE FOLLOWED. IF ANY DOUBT EXISTS ABOUT THE SAFE METHOD OF DOING A JOB, CONTACT YOUR SUPERVISOR BEFORE PROCEEDING.
11. HORSEPLAY WILL NOT BE TOLERATED.
12. DO NOT CRAWL UNDER OR CROSS OVER OPEN CONVEYORS EXCEPT AT BRIDGES PROVIDED FOR THAT PURPOSE. TRANSPORTING TOOLS OR EQUIPMENT ON MOVING CONVEYORS IS PROHIBITED.

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13. SAFETY INTERLOCKS SHALL NOT BE BY-PASSED ON ANY OPERATING EQUIPMENT.
14. CONTRACTOR AND CONTRACT PERSONNEL ARE TO CONFORM WITH THE RULES IN ALCOA POINT COMFORT SITE CONDITIONS AS STATED IN SECTION V OF THE CONSTRUCTION SPECIFICATIONS. IT IS THE RESPONSIBILITY OF THE OWNER'S REPRESENTATIVE TO INITIALLY COMMUNICATE THESE SITE CONDITIONS SAFETY RULES TO THE CONTRACTOR AND CONTRACT PERSONNEL. IT IS THE RESPONSIBILITY OF THE CONTRACTOR SUPERVISORY PERSONNEL TO INSURE THAT THE SAFETY RULES IN THE SITE CONDITIONS ARE ENFORCED.
15. MATERIALS MUST NOT BE THROWN OR DROPPED FROM ONE LEVEL TO ANOTHER. WHEN HAND-LINES OR CHUTES ARE NOT FEASIBLE THE CONTACT SUPERVISOR WILL BE RESPONSIBLE FOR PROVIDING A PROCEDURE SUCH AS BARRICADING THE AREA AND PLACING ADEQUATE WARNING SIGNS WITH PERSONNEL LOCATED AT THE LOWER LEVEL TO ASSURE THE AREA IS CLEAR PRIOR TO THE DROP.
16. WHEN REPAIRS OR MAINTENANCE MUST BE PERFORMED ON ONE OF A MULTI OVERHEAD CRANE INSTALLATION AND THE NECESSITY TO OPERATE THE OTHER CRANE(S) PRECLUDES THE USE OF THE STANDARD TAG-OUT PROCEDURE, THE FOLLOWING ACTIONS SHALL BE TAKEN FOR THE PROTECTION OF THE MAINTENANCE PERSONNEL

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- A. FOR SCHEDULED MAINTENANCE WORK, THE MAINTENANCE CREW SHALL HANG A SIGN ON THE CONTROLS OF THE CRANE(S) NOT BEING WORKED ON, WARNING OF MAINTENANCE BEING PERFORMED ON THE OTHER CRANE. FURTHER, THE MAINTENANCE CREW MUST PLACE A "DANGER--PEOPLE WORKING OVER-HEAD" SIGN BENEATH, AND HANG A FLASHING LIGHT ON THE CRANE BEING SERVICED. ONE MEMBER OF THE MAINTENANCE CREW SHALL BE DESIGNATED TO BE AWARE OF MOVEMENTS OF THE OTHER CRANE AND WARN HIS CO-WORKERS IF A COLLISION APPEARS IMMINENT.
- B. FOR SHORT DURATION TROUBLE-CALLS, A MAINTENANCE PERSON SHALL HANG A FLASHING LIGHT ON THE CRANE BEING REPAIRED. A PERSON MUST BE ASSIGNED TO WATCH AND WARN THE PEOPLE ON BOTH CRANES.

A CRANE OPERATOR MUST OPERATE WITH EXTREME CAUTION WHILE IN THE VICINITY OF, AND MUST NOT ALLOW THE OPERATING CRANE TO COME IN CONTACT WITH A CRANE BEING SERVICED.

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17. INSTALL APPROVED BARRICADES AND WARNING SIGNS WHERE PERSONNEL ARE ENDANGERED BY ACTIVITIES AND/OR CONDITIONS RESULTING FROM YOUR WORK. MAKE SURE THAT BARRICADE TAPE AND/OR FLAGS ARE SECURED PROPERLY AND EASILY VISIBLE TO ANYONE WHO MIGHT ENTER THE AREA FROM ANY DIRECTION. ALL BARRICADES ARE TO BE IDENTIFIED USING A WHITE INFORMATION TAG AND ON THIS SHOULD BE THE NAME, DATE, DEPARTMENT, AND REASON FOR ERECTING THE BARRICADE. NOTE: YELLOW AND BLACK BARRICADE TAPE IS CONSIDERED A WARNING ONLY AND CARE SHOULD ALWAYS BE EXERCISED IN THE SURROUNDED WORK AREA.

YELLOW AND BLACK TAPE MUST BE ERECTED AROUND DANGEROUS AREAS SUCH AS THE FOLLOWING:

- A. OPEN HOLES OR EXCAVATIONS.
- B. PLACES WHERE ACID, CAUSTIC OR OTHER HARMFUL LIQUIDS ARE DRIPPING OR STANDING.
- C. AREAS WHERE MEN ARE WORKING OVERHEAD AND THERE IS DANGER FOR OTHER WORKERS TO PASS UNDER. IN MULTILEVEL BUILDINGS THIS CAN INCLUDE ALL LEVELS IF A HAZARD EXISTS.
- D. AREAS WHERE LOADS ARE SUSPENDED ABOVE.
- E. AREAS WHERE HEAVY EQUIPMENT, SUCH AS CRANES, ARE BEING OPERATED FOR EXTENDED PERIODS.

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F. AREAS WHERE TOXIC SUBSTANCES ARE
BEING USED.

G. AREAS WHERE SANDBLASTING IS IN
PROGRESS.

ALL BARRICADE TAPE MUST BE REMOVED
COMPLETELY AFTER COMPLETION OF WORK
IN THE AFFECTED AREA.

IF REQUIRED, ROADS SHALL BE BARRICADED
WITH WOODEN BARRIERS COLORED YELLOW
AND BLACK FOR CAUTION AND RED, YELLOW
AND BLACK FOR NO ENTRY. BARRICADE
TAPE SHALL NOT BE USED TO BLOCK
PASSAGES OR ROADWAYS.

WARNING LIGHTS MUST BE UTILIZED AT
NIGHT IF LIGHTING IS NOT OTHERWISE
SUFFICIENT.

NOTE: RED FLAGS OR RED TAPE STREAMERS
SHOULD BE ATTACHED TO BARRICADES TO
INDICATE AREAS WHERE BODILY INJURY
OR DEATH COULD OCCUR DUE TO HAZARDS
CREATED IN THE WORK AREA.

NO ONE IS PERMITTED TO ENTER AREAS
BARRICADED BY YELLOW AND BLACK TAPE OR
WOODEN BARRICADES WITH RED TAPE STREAM-
ERS OR FLAGS ATTACHED UNLESS INSTRUCTED
TO DO SO BY A SUPERVISOR WHO IS KNOWLEDGE-
ABLE OF THE SITUATION AS A RESULT OF
CHECKING WITH THE PERSON WHO ERECTED
THE BARRICADE. RED FLAGS OR TAPE WILL
NOT BE INSTALLED IN A PRODUCTION AREA
WITHOUT APPROVAL FROM THE PRODUCTION
DEPARTMENT. ALL RED FLAGS OR TAPE
SHALL BE REMOVED IMMEDIATELY WHEN-
EVER THE EXISTING HAZARD HAS BEEN
CORRECTED.

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18. ALL TIE-INS OR CONNECTIONS TO THE PLANT POTABLE WATER LINES SHALL BE MADE IN ACCORDANCE WITH THE POTABLE WATER TIE-IN PROCEDURE, APPENDIX AE.
19.
 - A. WHEN HOISTING COMPRESSED AIR OR GAS CYLINDERS, A CRADLE DESIGNED TO HOLD THE CYLINDERS SECURELY IN PLACE MUST BE USED.
 - B. WHEN TRANSPORTING OR STORING COMPRESSED AIR OR GAS CYLINDERS, WHETHER EMPTY OR FULL, THEY MUST BE HELD SECURELY IN THE UPRIGHT POSITION WITH THE PROTECTIVE CAPS IN PLACE.
 - C. DO NOT LUBRICATE, MODIFY, OR TAMPER WITH CYLINDER REGULATORS OR VALVES.
 - D. REGULATORS AND GAUGES MUST BE PROTECTED BY GUARDS AS DEFINED IN THE E.S.A.
 - E. REFER TO E.S.A.
20. POINT COMFORT HAS A NETWORK OF INSULATED AND UNINSULATED HIGH VOLTAGE (ABOVE 600 VOLTS) DISTRIBUTION LINES THROUGHOUT THE OPERATIONS. NO WORK SHALL BE PERMITTED WITHIN TEN (10) FEET OF THESE LINES WITHOUT THE APPROVAL OF THE ELECTRICAL MAINTENANCE DEPARTMENT SUPERVISION. THE ELECTRICAL MAINTENANCE SUPERVISOR SHALL BE CONTACTED IF THERE IS ANY DOUBT ABOUT THE CIRCUIT VOLTAGE. THE ELECTRICAL MAINTENANCE SUPERVISOR WILL REVIEW THE PLANNED WORK AND, WHERE REQUIRED, WILL DETERMINE THE NECESSARY ARRANGEMENTS FOR THE PLANNED WORK TO SAFELY PROGRESS. THESE ARRANGEMENTS COULD BE, BUT ARE NOT LIMITED TO, THE FOLLOWING STEPS:
 1. DE-ENERGIZE AND TAG OUT THE HIGH VOLTAGE CIRCUIT AND INSTALL GROUNDS IF PRACTICAL.

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2. INSTALL PROTECTIVE SLEEVING ON UNINSULATED CONDUCTORS AND REDEFINE A CLOSER WORKING DISTANCE.
3. TEMPORARY INSTALLATION OF PHYSICAL BARRICADES TO PREVENT CONTACT WITH ENERGIZED CABLES.
4. IN CERTAIN CASES, THE ELECTRICAL SUPERVISOR MAY GRANT PERMISSION TO WORK CLOSER THAN TEN (10) FEET ON INSULATED DISTRIBUTION LINES.

DUE TO THE DAMAGE WHICH MAY BE INFLICTED ON CABLES WHETHER INSULATED OR UNINSULATED, UNDER NO CIRCUMSTANCES SHOULD ANY MATERIAL OR EQUIPMENT BE ALLOWED TO CONTACT A LINE, EVEN IF IT IS DE-ENERGIZED.

D. MISCELLANEOUS

1. ALL PLANT SIGNS AND SAFETY SIGNALS MUST BE OBEYED.
2. FIREARMS OR OTHER WEAPONS ARE FORBIDDEN ON COMPANY PROPERTY EXCEPT BY AUTHORIZATION OF THE PLANT SECURITY SUPERVISOR.
3. USE OF OR POSSESSION OF INTOXICANTS OR NARCOTICS IS PROHIBITED ON COMPANY PROPERTY.
4. WHEN A FIRE EXTINGUISHER IS USED IT MUST BE REPORTED TO YOUR SUPERVISOR SO IT WILL BE RECHARGED AND RESTORED TO ITS PROPER PLACE.

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5. FLAMMABLE OR COMBUSTIBLE LIQUIDS SHALL BE STORED IN CONTAINERS DESIGNED FOR THAT PURPOSE.
6. ANY PERSON WEARING A PACEMAKER IS PROHIBITED INSIDE THE PLANT GATE.

FOR YOUR PROTECTION AND THE SAFETY OF OTHERS, EMPLOYEES WHO VIOLATE ANY OF THE OPERATION'S GENERAL RULES OR MORE SPECIFIC PLANT AND DEPARTMENTAL RULES ARE LIABLE TO DISCIPLINARY ACTION.

E. OPERATIONS SAFE PRACTICES

1. REPORT ANY ACCIDENTS OR NEAR MISS ACCIDENTS TO YOUR SUPERVISOR IMMEDIATELY, WHETHER ANYONE IS HURT OR NOT.
2. NEVER CHANGE A WORK PROCEDURE UNTIL THE PROCEDURE HAS BEEN CHECKED BY YOUR SUPERVISOR.
3. CAUTION MUST BE USED WHEN WORKING AROUND OR STARTING PUMPS, CONVEYING EQUIPMENT, VALVES, GRINDING EQUIPMENT OR OTHER MACHINERY TO MAKE SURE NO EMPLOYEE IS IN A POSITION TO BE INJURED.

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4. NEVER WALK OR STAND UNDER A SUSPENDED LOAD
5. NEVER ATTEMPT TO PASS BETWEEN LOADS CARRIED BY MOBILE EQUIPMENT; SUCH AS, CRANES, ENDLOADERS, TRACTORS OR TRUCKS. NEVER ATTEMPT TO PASS BETWEEN LOADS CARRIED BY MOBILE EQUIPMENT AND FIXED OBJECTS.
6. SPECIAL CAUTION SHOULD BE EXERCISED TO PREVENT LOOSE CLOTHING OR TOOLS FROM GETTING CAUGHT IN MOVING EQUIPMENT.
7. AT NO TIME IS CLEANING PERMITTED ON A CONVEYOR, UNDER A CONVEYOR, ON PANS LOCATED UNDER A CONVEYOR, ON A PAN FEEDER OR PULLEY WHILE THE CONVEYOR IS OPERATING. WHEN SHOVELING MATERIAL ONTO A MOVING CONVEYOR, THE EMPLOYEE SHOULD FACE IN THE DIRECTION OF BELT TRAVEL.
8. APPROVED FLotation DEVICES MUST BE WORN WHEN THERE IS ANY POSSIBILITY OF FALLING INTO WATER.

APC 005430

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11-21-79

9. MATERIAL BEING TRANSPORTED ON A FLAT BED TRUCK OR TRAILER WITHOUT SIDEBORDS SHOULD BE SECURED.
10. DO NOT STAND IN FRONT OF ELECTRICAL SWITCHES WHEN OPERATING SAME. EXERCISE EXTREME CAUTION TO INSURE MOTORS ARE DEENERGIZED BY CONVENTIONAL CONTROL CIRCUITS OR PUSH BUTTONS BEFORE OPENING DISCONNECTS. AFTER OPENING THE MAIN DISCONNECT USE CONTROL CIRCUITS OR PUSH BUTTONS TO VERIFY THAT THE PROPER CIRCUIT HAS BEEN DEENERGIZED.
11. DO NOT USE HIGHLY FLAMMABLE LIQUIDS FOR CLEANING PARTS AND EQUIPMENT. EXCEPTION: USE OF ACETONE DURING FIBERGLASS APPLICATION AND THE USE OF SOLVENTS FOR CLEANING PAINTING EQUIPMENT.
12. USE PROPER TECHNIQUES IN MANUAL LIFTING OF LOADS. DO NOT ATTEMPT TO LIFT MORE THAN YOU ARE CAPABLE OF LIFTING.
13. PRIOR TO PERFORMING ANY JOB, ANALYZE IT FOR UNSAFE CONDITIONS AND WHAT UNEXPECTED THINGS MIGHT HAPPEN. DETERMINE STEPS AND ACTIONS NECESSARY TO PERFORM THE WORK SAFELY.
14. PLANT AIR LINE PRESSURE SHOULD NOT BE CONNECTED TO AIR SLIDES OR OTHER CLOSED CONTAINERS WHICH ARE NOT DESIGNED FOR THE RATED AIR LINE PRESSURE.

APC 005431

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06-27-79

15. EXTREME CARE SHOULD BE EXERCISED WHEN HANDLING LONG SECTIONS OF METAL PIPE OR RODS TO PREVENT THEM FROM TOUCHING EXPOSED ELECTRICAL CONDUCTORS.
 16. WHERE THERE IS A POSSIBILITY OF MATERIAL FALLING ON FEET, METATARSAL GUARDS SHOULD BE WORN.
 17. KEEP ALL AISLES AND EXITS CLEAR. DO NOT BLOCK ACCESS TO FIREFIGHTING EQUIPMENT, CONTROL VALVES, ELECTRIC PANELS, OR SWITCH BOXES.
 18. ANY TIME A VALVE IS LEAKING IN A LINE OR A VESSEL AND IT COULD CREATE A HAZARD, A YELLOW "LEAKING VALVE" CAUTION TAG SHOULD BE ATTACHED TO THE VALVE.
 19. WHEN WALKING INSIDE THE PLANT FENCE, ALL EMPLOYEES SHOULD NOT WEAR OPEN-TOE SHOES, SANDLES OR HIGH-HEEL SHOES.
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APC 005432

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03/05/80

SMEETING PLANT SAFETY RULES

1. SIDESHIELDS ARE REQUIRED ON ALL SAFETY GLASSES WORN IN THE SMELTING PRODUCTION AREAS.
2. THE RIDING OF TWO-WHEEL BICYCLES IS NOT PERMITTED IN ALL COVERED STRUCTURES IN THE SMELTING PRODUCTION AREA.

SMEETING PLANT SAFE PRACTICES

1. MAINTAIN A SAFE DISTANCE FROM EQUIPMENT TRANSFERRING OR POURING MOLTEN METAL OR BATH.
2. CLOTHING THAT IS MADE OF NYLON AND OTHER PRODUCTS SUCH AS POLYESTER, DACRON, AND BLENDS SHALL NOT BE WORN AROUND MOLTEN METAL, IN POTROOMS, AND INGOT PLANTS.

APC 005433

POTROOM DEPARTMENT SAFETY RULES

1. SHOES WORN IN THE POTROOM AREA MUST HAVE APPROVED NONCONDUCTIVE SOLES AND HEELS. VISITORS ARE EXCEPTED IF ACCOMPANIED BY A RESPONSIBLE GUIDE.
 2. LONG SLEEVES ARE REQUIRED IN ALL OPERATING POTROOMS INCLUDING PASSAGEWAYS. VISITORS ARE EXCEPTED IF ACCOMPANIED BY A QUALIFIED GUIDE. LONG SLEEVES ARE NOT REQUIRED WHEN WORKING ON HYDRAULIC SYSTEMS OF SPIKE PULLERS OR AUXILIARY FRAMES THAT ARE LOCATED AWAY FROM THE POTS IN THE EAST END OF THE POTROOMS.
 3. ALL VEHICLES MUST STOP BEFORE ENTERING "A", "B", OR "C" PASSAGEWAYS AND YIELD TO ANY TRAFFIC IN THE PASSAGEWAYS.
 4. ALL VEHICLES MUST HAVE LIGHTS ON INSIDE POTROOM BUILDINGS AT ALL TIMES.
 5. DO NOT DRIVE LARGE VEHICLES OR EQUIPMENT ACROSS OR THROUGH A OR B PASSAGEWAYS IN THE POTROOMS WITHOUT A FLAGGER AND PERMISSION FROM SMELTING SUPERVISION.
 6. DO NOT DRIVE LARGE VEHICLES OR EQUIPMENT ACROSS OR THROUGH C PASSAGEWAY IN THE POTROOM WITHOUT A FLAGGER.
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7. THE REVOLVING CAUTION LIGHT IN P PASSAGEWAY MUST BE TURNED ON PRIOR TO THE PASSAGE OF ANY CRANE TRAFFIC ACROSS THE PASSAGEWAY. VEHICULAR TRAFFIC IN THE PASSAGEWAY MUST STOP AND YIELD TO CRANE TRAFFIC BEFORE PROCEEDING.
8. PERSONNEL ON A POT, OR OBJECTS AT POT POTENTIAL, MUST NOT TOUCH A CRANE BLOCK OR CABLES, OR ATTEMPT TO TRANSFER ANY METAL OBJECT TO OR FROM SOMEONE ON THE CRANE.
9. PERSONNEL ON CRANES MUST NOT TOUCH, OR GUIDE WITH A METAL OBJECT, ANY PIECE OF EQUIPMENT WHILE IT IS ON OR OVER A POT.
10. EXTENSION CORDS CANNOT BE USED IN POTROOMS, SPECIAL EXCEPTION IS PERMISSIBLE WHEN APPROVED BY BOTH OPERATING AND ELECTRICAL MAINTENANCE DEPARTMENTS.
11. WELDING MACHINES MUST BE BARRICADED, WHEN LEADS ARE INSIDE POTROOMS, TO PREVENT PERSONNEL FROM TOUCHING THE WELDING MACHINE.
12. DO NOT TOUCH BATH OR METAL PADS IN COURTYARDS UNTIL IT IS CERTAIN THE BATH OR METAL IS CLEAR OF POTROOM BUS.

APC 005436

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POTROOM DEPARTMENT SAFE PRACTICES

1. APPROVED RESPIRATORS MUST BE WORN DURING ANY OPERATION THAT GENERATES DUSTY CONDITIONS SUCH AS: BREAKING THE POT CRUST WITH A CRUSTBREAKER, OREING-UP, SEALING AND SWEEPING DECK PLATES AND DISTRIBUTION OF BATH MATERIALS.
2. APPROVED GLOVES SHOULD BE WORN WHILE PERFORMING WORK ON OR AROUND SMELTING POTS.
3. RUBBER BOOTS OR OVERSHOES SHOULD BE WORN WHILE WORKING AROUND POTS OR BUS LINES WHEN THE FLOOR IS WET.
4. FULL FACE SHIELDS MAY BE WORN BUT SAFETY GLASSES OR MONOGOGGLES MUST BE WORN UNDER THE SHIELD.
5. DO NOT PASS OR REMAIN CLOSE TO A POT WHILE THE FOLLOWING OPERATIONS ARE BEING PERFORMED:
 - A. SLIPPING JACKS - DURING TIME ALL SPIKE CLAMPS ARE LOOSE.
 - B. SETTING SPIKES - DURING TIME THE SPIKE IS OUT OF THE HOLE.

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- C. WHEN PASTE OR BRIQUETTES ARE BEING
DUMPED INTO THE ANODE.
- 6. TREAT ALL EXPOSED BUS AS ENERGIZED
ELECTRICAL CONDUCTORS.
- 7. EXPOSED STEEL IN POTROOM FLOOR MUST BE
COVERED WITH NON-CONDUCTIVE MATERIAL OR
THE STEEL MUST BE REMOVED IMMEDIATELY.
- 8. DO NOT USE METALLIC MEASURING TAPES OR
RULERS WHILE IN THE POTROOM AREA.

APC 005438

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11-21-79

UTILITY DEPARTMENT SAFETY RULES

1. BEFORE WORKING BELOW FLOOR LEVEL IN POT STALLS OR BUS TRENCHES OF OPERATING POTLINES, A POTLINE GROUND MUST BE ATTACHED AND GROUND VOLTAGE CHECKED FOR SAFE LIMITS. (MAXIMUM 50 V.) THE EXCEPTION IS WHEN CHECKING STALL ELEVATION PRIOR TO INSTALLATION OF POT CRADLES. NON-CONDUCTIVE MEASURING DEVICES MUST BE USED.
2. WHEN REMOVING MATERIAL SUCH AS BATH OR LINING FROM A CUT OUT POT SHELL NOT COVERED BY GROUNDING DEVICE, ALL BUCKETS OR SCRAP CONTAINERS, INCLUDING PAYLOADERS, MUST BE CONNECTED (BONDED) TO POT SHELL.

UTILITY DEPARTMENT SAFE PRACTICES

1. DO NOT MOVE ANY RAIL CAR WITH ANY VEHICLE THAT DOES NOT HAVE A COUPLING FOR FIXED ATTACHMENT TO THE CAR.

APC 005439

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9-15-76

PASTE DEPARTMENT SAFETY RULES

1. ALL EMPLOYEES ARE FORBIDDEN TO RIDE ON CONVEYORS, PASTE CARS, ELEVATORS OR CRANE LOADS.

PASTE DEPARTMENT SAFE PRACTICES

1. SAFETY GATE MUST BE USED TO STOP VEHICULAR TRAFFIC WHEN OPERATING THE CAR PULLER AT COKE UNLOADING STATION.
2. DO NOT PLACE TOOLS OR OTHER OBJECTS INTO A MIXER WHILE THE BLADES ARE STILL MOVING.

APC 005441

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9-15-76

POT REPAIR DEPARTMENT SAFE PRACTICES

1. DO NOT WALK OR CLIMB AROUND DIGGING MACHINE UNTIL THE AIR SOURCE IS COMPLETELY TURNED OFF.
2. IF CLOTHES BECOME OIL SOAKED OR CONTAMINATED WITH DUG POTLINING, CHANGE BEFORE BEGINNING ANOTHER SHIFT. OIL SOAKED CLOTHES CAN BE DANGEROUS. A LONG SLEEVE SHIRT MUST BE WORN, WITH SLEEVES BUTTONED, WHILE LINING, BANKING BLOCKS OR OPERATING WELDING AND CUTTING EQUIPMENT.

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INGOT DEPARTMENT SAFETY RULES

1. LONG SLEEVES ARE REQUIRED IN BUILDING 19. VISITORS ARE EXCEPTED IF ACCOMPANIED BY A RESPONSIBLE GUIDE.

INGOT DEPARTMENT SAFE PRACTICES

1. ANY CONTAINER TO WHICH MOLTEN METAL IS TO BE ADDED MUST BE PREHEATED AND/OR THE BOTTOM TREATED WITH SAE 30 OIL TO REDUCE THE DANGER OF EXPLOSION.
2. ALL TOOLS USED IN STIRRING, SKIPPING, OR LADLING MOLTEN METAL MUST BE WARM, DRY, AND FREE FROM HEAVY OXIDATION.
3. ALL SMELTING INGOT MUST BE PREHEATED TO DRY OUT MOISTURE BEFORE CHARGING INTO MOLTEN METAL.
4. ALL INGOT AND COMMERCIAL METAL WITH CORRODED SURFACES MUST BE HEATED AND SPRAYED WITH SAE 30 OIL TO MINIMIZE EFFECTS OF COMBINED WATER IN CORROSION PROCESS.

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5. ALL EMPLOYEES MUST LEAVE THE DC PIT AREA AS EACH INGOT IS BEING REMOVED WITH THE CRANE AND WATCH FROM A SAFE LOCATION.
6. THE FLOOR AREA ON WHICH MOLTEN METAL COULD COME IN CONTACT SHOULD BE DRY AND NOT HAVE WATER PUDDLES.

APC 005446

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03/05/80

ALUMINA PLANT SAFETY RULES

1. GOGGLES MUST BE CARRIED BY ALL PERSONNEL FOR USE IN PRESCRIBED AREAS OR OPERATIONS.
2. ALL HOSES MUST HAVE LOCKING PINS, CLIPS, OR SNAG FREE WIRE WITH THE ENDS TWISTED TOGETHER INSERTED IN THEIR CONNECTING DEVICES.
3. COMPRESSED AIR MUST NOT BE USED TO CLEAR BLOCKED OR CHOKED LINES.
4. THE RIDING OF BICYCLES OR TRICYCLES IN BUILDINGS R-42, R-25A, R-33 AND R-50 FEED END IS NOT PERMITTED. BICYCLES OR TRICYCLES ARE NOT PERMITTED TO BE RIDDEN THROUGH THE EAST AND WEST PASSAGeways IN BUILDING R-35 WHEN THE SAFETY POSTS ARE IN POSITION.

ALUMINA PLANT SAFE PRACTICES

1. HEARING PROTECTION AID SHOULD BE CARRIED BY ALL PERSONNEL AND MUST BE USED IN DESIGNATED AREAS.
2. GOGGLES AND LONG SLEEVE SHIRTS SHOULD BE WORN WHEN WORKING IN AREAS WITH EXPOSURE TO LIME TO AVOID LIME CONTACTING SKIN AND CAUSING BURNS.

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RAW MATERIALS DEPARTMENT SAFETY RULES

1. MONOGOGGLES MUST BE WORN BY EMPLOYEES WHILE WORKING WITH BRIQUETTES.
2. WHEN BOARDING BARGES OR TOW BOATS, HANDLING SHIP LINES ON DOCKS, OR PERFORMING THE WORK WHERE THERE IS A POSSIBILITY OF FALLING INTO THE WATER, PERSONNEL SHALL WEAR A FLotation DEVICE AS PROVIDED BY THE DEPARTMENT.
3. BEFORE DEPARTMENT PERSONNEL BOARD A SHIP, VIA THE GANGWAY, THE SHIP MUST HAVE INSTALLED A SAFETY NET UNDER THAT PORTION OF GANGWAY WHICH IS SUSPENDED OVER THE WATER.
4. WHEN IT IS NECESSARY TO TAG OUT THE HOT RAILS ON R-10 DOCK, THEY MUST BE TAGGED OUT AT TWO LOCATIONS (1) SWITCH IN FRONT OF THE R-10 OFFICE, AND (2) SWITCH AT THE WEST END OF THE DOCK.

APC 005449

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9-15-76

RAW MATERIALS DEPARTMENT SAFE PRACTICES

1. WHILE PUMPING ACIDS OR CAUSTIC TO OR FROM BARGES OR SHIPS, AT NO TIME CAN THE OPERATION BE LEFT UNATTENDED. PUMPS ON ACID BARGES AT R-10 MUST BE SHUT DOWN WHEN A SHIP OR BOAT ENTERS THE AREA CAUSING WATER TURBULANCE. THE OPERATOR MUST BE KNOWLEDGEABLE IN AND COMPLY WITH ALL U.S. COAST GUARD REGULATIONS PERTAINING TO THE OPERATION.
2. DOCK EMPLOYEES SHOULD STAND WELL CLEAR OF SHIPS MOORING LINES WHILE SHIP IS WINCHING LINES TIGHT.
3. WHEN DOCKING OR SAILING SHIPS, GANTRIES SHOULD BE MOVED TO SHORE END OF DOCK.

APC 005450

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9-15-76

DIGESTION DEPARTMENT SAFETY RULES

1. EAR PROTECTION IS REQUIRED NEAR OPERATING ROD MILLS.
2. STARCH DUST IS AN EXPLOSIVE MATERIAL. NO SMOKING OR EXTENSION CORDS ARE PERMITTED IN THE R-8 AREA. WELDING AND BURNING ARE PERMITTED ONLY BY PERMIT ISSUANCE.

DIGESTION DEPARTMENT SAFE PRACTICES

1. WHEN CLEANING, SWEEPING OR BLOWING IN THE AREA WHERE THE LIME FEEDERS ARE LOCATED, APPROVED RESPIRATORS ARE REQUIRED. AFTER JOB IS COMPLETED GO TO AN EYE WASH STATION AND THOROUGHLY WASH EYES AND AREA AROUND SHIRT COLLARS AND CUFFS. LIME DUST WILL REACT WITH MOISTURE INCLUDING PERSPIRATION, TO PRODUCE INTENSE BURNING. IF BURNING IS PERSISTENT, GO TO THE DISPENSARY.
2. BEFORE WALKING ALONGSIDE OPERATING MILLS IN R-25, MAKE CERTAIN THAT NO LEAKS ARE PRESENT AND THAT NO LIQUOR IS SPRAYING AS THE MILL TURNS.

APC 005451

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01/16/80

APC 005452

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06-27-79

PRECIPITATION DEPARTMENT RULES

BICYCLES ARE PROHIBITED ON TOP FLOOR OF
R-45.

APC 005453

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01/16/80

PRECIPITATION DEPARTMENT SAFE PRACTICES

1. EAR PROTECTION MUST BE WORN BY ALL PERSONNEL WORKING WITHIN A THREE TANK AREA ADJACENT TO A TANK BEING SCALED. THIS AREA SHOULD BE POSTED.
2. SAFETY BELTS MUST BE WORN WHEN LEANING OVER A PRECIPITATOR TO REMOVE FOAM RINGS OR OTHER SCALE FORMATIONS.
3. MAINTENANCE EMPLOYEES ASSIGNED TO WORK UNDER PRECIPITATOR AND SECONDARY TANKS SHOULD NOTIFY THE TOP OPERATOR OF THAT AREA BEFORE STARTING THE JOB.

EMPLOYEE WILL PLACE "MEN WORKING BELOW" SIGNS ON TOP FLOOR OF BUILDING R45 IN THE AREA WORK IS BEING PERFORMED ON BOTTOM FLOOR. WHEN FINISHED, OR IF MAINTENANCE EMPLOYEES LEAVE THE AREA FOR ANY EXTENDED PERIOD OF TIME, THEY WILL NOTIFY THE TOP OPERATOR OF SUCH ACTION. MAINTENANCE EMPLOYEES WILL REMOVE SIGNS TO STORAGE.

APC 005454

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CALCINATION DEPARTMENT SAFETY RULES

BEFORE ENTERING AN ELECTROSTATIC
PRECIPITATOR, CLEARANCE MUST BE OBTAINED
FROM A CALCINATION DEPARTMENT SUPERVISOR
PRIOR TO ENTERING.

CALCINATION DEPARTMENT SAFE PRACTICES

1. WHEN OBSERVING OPERATION OF DORRCO
FILTERS, MONOGOGGLES SHOULD BE WORN.
2. PERSONNEL MUST NOT STAND ON SCREW
CONVEYOR HOUSINGS.
3. PERSONNEL SHOULD BE CAUTIOUS WHEN
WORKING AROUND THE DISCHARGE END
OF OPERATING KILNS WHERE A
POSSIBILITY EXISTS FOR THE KILN
TO PLUG AND SPILL OVER.
4. WHEN PERSONNEL PERFORM WORK ON TOP
OF THE COOLING TOWERS OF R-50 AND
R-55, THE FANS MUST BE STOPPED AND
LOCKED OUT.

APC 005455

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5. SMOKING OR OPEN FLAMES ARE NOT PERMITTED AROUND THE GAS REDUCING STATIONS OF R-50, R-55 AND R-60.
6. EXTREME CAUTION SHOULD BE GIVEN TO ALL ALUMINA SPILLS IN AREA. NON-HAZARDOUS APPEARING MATERIAL CAN BE EXTREMELY HOT AND CAUSE SERIOUS INJURY.

APC 005456

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GENERAL LAB SAFETY RULES

1. SAFETY GLASSES MUST BE WORN THROUGHOUT THE LABORATORY. EXCEPTIONS ARE OFFICES, RESTROOMS AND LUNCH AREAS.
2. MONOGOGGLES MUST BE WORN WHEN OPENING VALVES TO OBTAIN SAMPLES, WHILE COLLECTING SAMPLES, WHILE CLOSING VALVES AFTER SAMPLES ARE COLLECTED AND WHILE TAKING HOT AND/OR DRY SAMPLES SUCH AS LIME OR GYPSUM.
3. MONOGOGGLES AND APPROVED APRONS MUST BE WORN WHEN MIXING OR TRANSFERRING ACIDS, CAUSTICS, CLEANING SOLUTIONS, BAYER PLANT LIQUORS, OR OTHER HAZARDOUS SOLUTIONS. THE HANDLING OF SMALL QUANTITIES OF SOLUTIONS WHILE PERFORMING A CHEMICAL ANALYSIS IS EXCLUDED.
4. APPROVED SAFETY GLOVES MUST BE WORN WHEN SAMPLING, DISHWASHING, TRANSFERRING ACIDS AND CAUSTICS, AND PLACING OF SAMPLES INTO HIGH TEMPERATURE FURNACES.

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- 5. NO PIPETTING OF ANY LIQUIDS BY MOUTH.
USE VACUUM HOSE OR RUBBER BULB.
- 6. PERFORM ONLY AUTHORIZED EXPERIMENTS.

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GENERAL LAB SAFE PRACTICES

1. ALL SPILLS OR LEAKS SHOULD BE CLEANED UP IMMEDIATELY.
2. ALL CONTAINERS OR REAGENTS SHOULD BE LABELED CLEARLY AND PERMANENTLY. ANY MATERIAL IN UNLABELED CONTAINERS SHOULD BE DISPOSED OF CAREFULLY.
3. CIGARETTE BUTTS SHOULD BE EXTINGUISHED IN AN ASH TRAY OR DRENCHED WITH WATER AND PLACED IN TRASH CAN.
4. NO MATERIAL, EQUIPMENT, OR GLASSWARE SHOULD BE STORED ON WINDOW SILLS OR ON THE FLOOR.
5. EACH WORKER IS RESPONSIBLE FOR KEEPING THE WORK AREA AND EQUIPMENT NEAT AND ORDERLY. ALL WORKERS USING COMMUNITY AREAS SUCH AS HOODS, OVENS, AND BALANCES SHOULD SHARE RESPONSIBILITY FOR KEEPING THOSE AREAS NEAT AND ORDERLY.
6. ALL GLASSWARE THAT IS CRACKED OR SCARRED SHOULD NOT BE USED FOR ANY ANALYSIS REQUIRING VACUUM OR HEAT.

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7. ALL BROKEN GLASSWARE SHOULD BE DISPOSED OF IN "GLASS CANS" WHICH ARE FOR BROKEN GLASS ONLY.
8. SIDE SHIELDS SHOULD BE USED WITH SAFETY GLASSES.
9. APPLY VACUUM ONLY TO GLASSWARE MADE FOR SUCH SERVICES.
10. CARRY OR TRANSPORT GLASSWARE IN A SAFE MANNER. DESICCATORS SHALL BE CARRIED WITH BOTH HANDS. LIDS MUST BE SUPPORTED.

X-RAY LAB SAFETY RULES

1. FILM BADGES WILL BE WORN BY ALL PERSONNEL ASSIGNED TO WORK REGULARLY IN THE SAME ROOM AS THE X-RAY EQUIPMENT.
2. NO SERVICE WORK WILL BE PERFORMED ON THE X-RAY EQUIPMENT WITHOUT SPECIFIC PERMISSION FROM THE RADIATION SUPERVISOR.
3. PERCHLORIC ACID MUST BE USED ONLY UNDER AN APPROVED PERCHLORIC HOOD.

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4. ALL DOORS LEADING TO THE X-RAY LAB ARE TO BE LOCKED WHEN AUTHORIZED PERSONNEL ARE NOT PRESENT (SUCH AS NIGHTS AND WEEKENDS).
5. "RADIATION AREA" SIGNS WILL BE POSTED ON DOORS TO X-RAY LAB AND BARRICADES WILL BE PLACED AROUND THE X-RAY EQUIPMENT WHEN OPERATING PERSONNEL ARE NOT PRESENT.
6. ONLY AUTHORIZED PERSONNEL WILL BE PERMITTED AROUND THE X-RAY EQUIPMENT.
7. USE ONLY THOSE GASES SPECIFIED IN THE ATOMIC ABSORPTION OPERATING MANUAL AND ACCORDING TO THE PROCEDURES IN THE MANUAL.

QUANTOMETER LAB SAFETY RULES

1. USE SAFETY GLASSES WHILE USING LATHE.
2. DO NOT ATTEMPT REPAIRS ON EQUIPMENT IN LAB WITHOUT PRIOR PERMISSION FROM LABORATORY SUPERVISOR.

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GENERAL RULES FOR CHEMICALS PLANT

1. ALL PERSONNEL MUST HAVE USABLE MONO-GOGGLES ON THEIR PERSON AT ALL TIMES.
2. ALL HOSES MUST HAVE LOCKING PINS OR CLIPS IN THEIR CONNECTING DEVICES.

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CHLOR-ALKALI DEPARTMENT SAFETY RULES

GENERAL

1. CHLOR-ALKALI PLANT VISITORS MUST ALWAYS BE ESCORTED BY A COMPETENT GUIDE UNLESS THOROUGHLY FAMILIAR WITH THE PLANT'S SAFETY REQUIREMENTS.

APPAREL

1. ALL PERSONNEL MUST HAVE AN APPROVED RESPIRATOR ON THEIR PERSON AT ALL TIMES WITHIN THE POSTED CHLOR-ALKALI PLANT AREA.
2. RUBBER SHOES (LEHIGH MODEL 1149 OR 1151 ONLY) SHALL BE WORN BY ALL PERSONNEL ASSIGNED TO PERFORM WORK ON EQUIPMENT AT CELL POTENTIAL IN THE CELL BUILDING. IN ADDITION, SPECIALLY POSTED AREAS IN THE CELL BUILDING REQUIRE THESE SHOES AT ALL TIMES. VISITORS AND WALK-THRU PERSONNEL MAY SUBSTITUTE LEHIGH MODEL 2744 OVERSHOES WHENEVER ACCESS IS REQUIRED TO THE POSTED AREAS OF THE CELLROOM.

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3. RUBBER GLOVES (STOREROOM STOCK #220-481-0025 OR 220-482-0015) SHALL BE WORN BY ALL PERSONNEL WORKING ON CELLS, DE-COMPOSERS, CAUSTIC POTS, MERCURY PUMP TANKS, AND CELL END BOXES. IF THE NEED EXISTS FOR ABRASION PROTECTION, ADDITIONAL GLOVES SUCH AS COTTON OR VINYL SHOULD BE WORN OVER THE ABOVE. EXCEPTION IS THE SPECIAL PROCEDURE FOR ELECTRICIANS WORKING ON CELL SHORTING SWITCHES.

ELECTRICAL

1. EXTENSION CORDS CANNOT BE USED IN THE R-300 BUILDING. SPECIAL EXCEPTION IS PERMISSIBLE WHEN APPROVED BY BOTH OPERATING AND ELECTRICAL MAINTENANCE DEPARTMENT.

HYGIENE

1. NO FOOD, LUNCH PAILS, CHEWING GUM, TOBACCO PRODUCTS, DRINKS, OR EATING UTENSILS ARE PERMITTED IN ANY PART OF THE CELL BUILDING (OPERATING FLOOR, GROUND FLOOR, AND CELL SERVICE AREA).

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2. MERCURY HANDLING - RESPIRATORS SHALL BE WORN AT ALL TIMES WHEN WORKING ON OPEN CELLS, OPEN MERCURY PUMP TANKS, OPEN DECOMPOSERS, OPEN OUTLET OR IN-LET END BOXES.
3. WHEN WORKING IN THE CHLOR-ALKALI DEPARTMENT, PRIOR TO ENTERING THE LUNCHROOM, SHOES MUST BE CLEANED, HARD HATS, RESPIRATOR, AND GLOVES MUST BE REMOVED AND LEFT OUTSIDE THE LUNCHROOM.

FIRE

- A. BECAUSE HYDROGEN GAS IS PROCESSED IN THE PLANT, NO SMOKING OR OPEN FLAMES ARE ALLOWED IN THE PLANT EXCEPT IN THOSE AREAS DESIGNATED AS FOLLOWS:
 1. SUPERVISOR'S OFFICE AND MAIN CONTROL ROOM.
 2. BRINE AREA, SOUTH OF ROAD BY RECTIFIER TRANSFORMERS AND WEST OF ROAD BY CHLORINE STORAGE TANKS.

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3. CHLORINE DOCK OFFICE/VALVE SHOP.
 4. AREAS AROUND LAUNDRY FACILITIES.
 5. LUNCHROOMS.
- B. HYDROGEN EQUIPMENT MUST BE PURGED
WITH CARBON DIOXIDE FOR FOUR HOURS
AND VERIFIED SAFE BY THE OPERATING
DEPARTMENT PRIOR TO ANY BURNING.

CHLOR-ALKALI DEPARTMENT SAFE PRACTICES

GENERAL

1. ALL PERSONNEL ENTERING THE PLANT AREA
SHOULD REPORT TO A MAINTENANCE OR
OPERATING SUPERVISOR ASSIGNED TO
CHLOR-ALKALI BEFORE STARTING ANY WORK.
2. ALL PERSONNEL SHOULD STAY OUT OF THE
PLANT CONTROL ROOMS UNLESS THERE EXISTS
A SPECIFIC REASON FOR ENTERING.

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APPAREL

1. RESPIRATORS

- A. RESPIRATORS SHOULD BE STORED IN A MERCURY-FREE ATMOSPHERE WHEN NOT IN USE.
- B. INDIVIDUALS WORKING IN THE CELL BUILDING SHOULD WASH RESPIRATORS WITH SOAP AND WATER AND CHANGE THEIR FILTER CARTRIDGES DAILY. OTHER PERSONNEL SHOULD CHANGE THEIRS WHEN NECESSARY.

2. RUBBER SHOES

- A. THE PRIMARY CHECK OF INSULATION INTEGRITY WILL BE A DAILY INDIVIDUAL INSPECTION. STEEL FILINGS, NAILS, OR BRINE ENCRUSTMENT COULD ALLOW ELECTRICAL LEAKAGE CURRENT TO PASS THROUGH THESE BOOTS. IF AN INDIVIDUAL FEELS THAT THEIR SHOES ARE INADEQUATE, THEY SHOULD CONTACT THEIR SUPERVISOR.
- B. SHOES SHOULD BE WASHED DAILY WITH WATER TO REMOVE BRINE.

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3. CLOTHING

- A. BRINE SOAKED CLOTHING, WET OR DRY, SHOULD BE CHANGED BEFORE WORKING ON ANY ELECTRICAL EQUIPMENT.
- B. IF WORKING IN CRAMPED QUARTERS AROUND EQUIPMENT AT CELL POTENTIAL, PERSPIRATION SOAKED CLOTHING COULD CAUSE ELECTRICAL SHOCK. PLACE RUBBER BLANKETS OVER THE SOURCE OF THE ELECTRICAL SHOCK BEFORE PROCEEDING WITH THE TASK.

4. GOGGLES

MONOGOGGLES SHOULD BE WORN WHEN EXPOSED TO OVERHEAD HAZARDS OF DRIPS OR LEAKS OR WHEN OPERATING PROCESS VALVES.

ELECTRICAL

- 1. NEVER ENTER HIGH VOLTAGE AREAS UNLESS ACCOMPANIED BY A MEMBER OF THE ELECTRICAL OR OPERATING DEPARTMENT. THIS INCLUDES THE UPSTAIRS AREAS OF R-301, ALL OF R-301A, AND ALL OF R-301B.

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2. RUBBER BLANKETS ARE REQUIRED ANYWHERE IN THE CELL ROOM WHERE DANGER OF COMING IN CONTACT WITH GROUND POTENTIAL EXISTS.
 - A. ON CONCRETE BEAMS NEAR CELL SWITCHES.
 - B. ON BRACKETS NEAR CAUSTIC POTS.
3. ALWAYS APPROACH EQUIPMENT OPERATING AT CELL POTENTIAL WITH CAUTION, ESPECIALLY EQUIPMENT ON THE SOUTH END OF THE CELL ROOM.
4. NEVER GRAB OR TOUCH ANYONE WORKING ON CELL LINE EQUIPMENT IF YOU ARE ELECTRICALLY GROUNDED IN ANY WAY.
5. AIR SHOULD NOT BE BLOWN INTO STARTER CABINETS OR SWITCHGEAR CABINETS WITHOUT ELECTRICAL DEPARTMENT APPROVAL.
6. DO NOT USE METALLIC MEASURING TAPES OR RULERS WHILE INSIDE CELL BUILDING.

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HYGIENE (GENERAL)

1. HANDS, ARMS, AND FACE SHOULD BE THOROUGHLY WASHED IN SOAP AND HOT WATER BEFORE BREAKS FOR EITHER EATING, DRINKING OR SMOKING.
2. IF CUFFS ARE WORN ON PANTS, THEY SHOULD BE CHECKED BEFORE LEAVING THE CELL ROOM AREA TO PREVENT ANY TRAPPED MERCURY FROM BEING CARRIED TO ANOTHER AREA. IN GENERAL CUFFLESS PANTS SHOULD BE USED WHERE POSSIBLE. WOOLS, KNITS, OR OTHER LOOSELY WOVEN FIBER CAN ACCUMULATE MERCURY AND, IF POSSIBLE, SHOULD NOT BE WORN.

3. MERCURY HANDLING

- A. EQUIPMENT USED IN MERCURY HANDLING SHOULD BE THOROUGHLY WASHED BEFORE BEING REMOVED FROM CELL BUILDING. IN ADDITION, SUCH EQUIPMENT SHOULD BE TAGGED "CAUTION--WATCH FOR MERCURY" BEFORE LEAVING THE DEPARTMENT.

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- B. IF ANY MERCURY IS FOUND OR SPILLED,
IT SHOULD BE REPORTED TO THE
OPERATING DEPARTMENT IMMEDIATELY.
THERE SHOULD NEVER BE ANY SPILLED
MERCURY LEFT IN ANY WORK AREA.
- C. ALL MERCURY SHOULD BE PERMANENTLY
STORED IN CLOSED CONTAINERS AND
TEMPORARILY STORED IN WATER COVERED
CONTAINERS.

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ELECTROLYTE DEPARTMENTAL SAFETY RULES

A. SAFETY APPAREL

IN ADDITION TO THE GENERAL PLANT SAFETY EQUIPMENT (CONSISTING OF PLASTIC HARD HATS, SAFETY GLASSES, MONOGOGGLES, AND SAFETY TOE SHOES), THE FOLLOWING RULES APPLY:

1. RUBBER OR PLASTIC GLOVES MUST BE WORN WHEN PERFORMING JOB FUNCTIONS WHENEVER THERE IS POSSIBILITY OF CHEMICAL BURNS OR PHYSICAL DAMAGE TO THE HANDS.
2. RAIN SUITS MUST BE WORN IN THE AREA WHILE CLEANING HYDROGEN FLUORIDE (HF) LINES, REMOVING HF SPOOLS, AND LOADING ACID BARRELS AND WAGONS.
3. MONOGOGGLES MUST BE WORN IN THE AREA WHEN PACKING PUMPS AND OPERATING VALVES.

ELECTROLYTE DEPARTMENTAL SAFE PRACTICES

1. ALL PERSONNEL ENTERING THE PLANT AREA SHOULD REPORT TO A SUPERVISOR ASSIGNED TO THE AREA BEFORE STARTING ANY WORK.

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2. ALL PERSONNEL SHOULD STAY OUT OF THE CONTROL AND LUNCHROOMS UNLESS THERE EXISTS A SPECIFIC REASON FOR BEING THERE.
3. ACID SPILLAGE SHOULD BE NEUTRALIZED WITH LIME OR SODA ASH IMMEDIATELY.
4. SULFURIC ACID AND CAUSTIC BURNS ARE NORMALLY SURFACE BURNS WHICH SHOULD BE TREATED AT THE PLANT DISPENSARY.
5. LIQUID HF ACID BURNS PENETRATE THE SKIN. THE MEDICAL ATTENDANT SHOULD BE INFORMED THAT A BURN IS FROM LIQUID HF ACID SO THE PROPER TREATMENT CAN BE APPLIED.
6. STAY WELL CLEAR BEHIND EXPANDED METAL GUARDS WHILE OPERATING ALL CAR PULLERS.
7. HF GAS HANDLING - AVOID BREATHING FUMES. WHEN IN AN AREA WHICH CONTAINS A SIGNIFICANT AMOUNT OF HF GAS, USE A MOIST HANDKERCHIEF, IF POSSIBLE, AND EVACUATE THE AREA IMMEDIATELY.

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8. FLUORSPAR HANDLING - AVOID PROLONGED BREATHING OF FLUORSPAR DUST. DUST MASKS SHOULD BE UTILIZED TO FILTER OUT THE DUST FROM THE AIR BEING BREATHED.
9. CRYOLITE HANDLING - AVOID PROLONGED BREATHING OF CRYOLITE DUST. DUST MASKS SHOULD BE USED TO FILTER ANY AIR BEING BREATHED.
10. ALL FOOD AND DRINKS MUST BE CONSUMED IN THE LUNCHROOMS PROVIDED.
11. HANDS, FACE, AND ARMS SHOULD BE THOROUGHLY WASHED IN SOAP AND WATER BEFORE EATING OR DRINKING.

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OIL & GAS OPERATIONS SAFETY RULES

1. NO UNAUTHORIZED PERSONNEL ARE PERMITTED ON OR IN COMPANY OPERATED FACILITIES.
(THIS INCLUDES GAS PLANT, COMPRESSOR STATIONS, WELL PLATFORMS, TRUCKS, BOATS, ETC.)
2. BOAT OPERATORS AND ALL PASSENGERS SHALL KNOW WHERE LIFE JACKETS, RINGS, ETC. ARE STORED.
3. GAS PIPELINE INSTALLATIONS, VESSELS AND COMPRESSORS ARE TO BE PURGED WITH NATURAL GAS BEFORE PUTTING INTO OPERATION OR BEFORE WELDING ON SAME.

OIL & GAS OPERATIONS SAFE PRACTICES

1. FIRST AID KITS AND FIRE EXTINGUISHERS ARE AVAILABLE IN ALL FACILITIES (COMPRESSOR STATIONS, TRUCKS, BOATS, ETC.) AND SHALL BE KEPT IN GOOD CONDITION AND READY FOR IMMEDIATE USE.

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2. PERSONAL PROTECTIVE EQUIPMENT SHOULD BE READILY AVAILABLE WHEREVER IT MAY BE NEEDED (SAFETY GLASSES, DARK GLASSES, FACE SHIELD, RUBBER BOOTS, RAINCOATS, RESPIRATOR, GAS MASK, EAR PLUGS, ETC.).
 3. EMPLOYEES SHOULD LEARN LOCATIONS OF ALL EMERGENCY SAFETY EQUIPMENT THAT THEY MAY HAVE AN OCCASION TO NEED (FIRE EXTINGUISHERS, LIFE JACKETS, ETC.).
 4. WHEN REMOVING BULL PLUGS, GAUGES, ETC. THAT MAY HAVE PRESSURE BEHIND THEM, ALWAYS STAND TO ONE SIDE AND NOT IN FRONT OF OPENING.
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APC 005480

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9-15-76

SHOP MAINTENANCE R-148 SAFETY RULES

1. GOGGLES OR FACE SHIELD SHALL BE WORN WHEN GRINDING, POLISHING, CHIPPING AND USING ABRASIVE CUT OFF TOOLS.
2. GOGGLES OR FACE SHIELD SHALL BE WORN WHEN MACHINING CAST IRON OR ANY MATERIAL THAT POWDERS WHEN BEING MACHINED.

SHOP MAINTENANCE R-148 SAFE PRACTICES

1. ALL MOBILE EQUIPMENT WILL BE OPERATED AT A SAFE SPEED, ACCORDING TO AREA WORKING IN.
2. NEVER USE A PALLET WITH A BROKEN OR MISSING SLAT.
3. CLEAN UP AND MAINTAIN YOUR WORK AREA IN AN ORDERLY FASHION.
4. INSTALL BARRICADES OR REFLECTIVE TAPE AROUND ANY OBJECT PROTRUDING BEYOND AND INTO A WALK AREA.
5. ONLY APPROVED AIR NOZZLES ARE TO BE USED FOR CLEANING OR BLOWING OFF PARTS.

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6. PROPER SHIELDS OR CURTAINS WILL BE USED
AROUND A WELDING JOB SO AS TO PROTECT
YOUR FELLOW WORKER.

APC 005482

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REFINING POWER DEPARTMENT SAFETY RULES

1. ALL PERSONNEL ENTERING THE R-110 AREA
MUST REPORT INITIALLY TO OPERATING
PERSONNEL IN THE CONTROL ROOM.
2. WHEN WORK IS TO BE PERFORMED ON THE XPV
COMPRESSOR THE FLYWHEEL LATCH MUST BE
SECURELY PLACED AND THE WHEEL CHAINED
BEFORE STARTING TO WORK.

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SMEETING POWER MAINTENANCE AND OPERATING
DEPARTMENT SAFETY RULES

1. THE FOLLOWING PROCEDURE SHALL GOVERN EQUIPMENT TAGGING. THIS PROCEDURE IS ESPECIALLY DESIGNED FOR WORK IN THE POWER DEPARTMENT AND NOT TO BE CONFUSED WITH THE "DANGER TAG RULES" APPLYING TO ALL OTHER DEPARTMENTS SET FORTH IN DANGER TAG RULES UNDER SPECIFIC RULES.
 - A. MAINTENANCE WORK REQUIRING A UNIT OUT OF SERVICE IS NOT TO BEGIN UNTIL THE PROPER CLEARANCE TAG HAS BEEN OBTAINED. MAINTENANCE WORK IS NOT TO BE DONE ON ANY UNIT WHILE IT IS OPERATING EXCEPT WITH PERMISSION FROM THE MAINTENANCE SUPERVISOR.
 - B. THE PARTY OBTAINING A CLEARANCE TAG FOR MAINTENANCE WORK MUST BE AUTHORIZED TO DO SO BY THE MAINTENANCE SUPERVISOR. POSSESSION OF AN AREA MAINTENANCE TICKET (AMT) COVERING WORK WILL BE CONSIDERED THE MAINTENANCE SUPERVISOR'S AUTHORIZATION.

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- C. AMT'S WILL BE SENT TO THE MAINTENANCE SUPERVISOR OR CALLED IN. WHEN CALLED IN, THE AMT WILL BE HUNG ON THE CLIPBOARD WITH FORM PC-75E-71.
- D. WHEN AN ENGINE IS SHUT DOWN FOR MAINTENANCE THE POWER HOUSE SUPERVISOR OR SPECIALLY AUTHORIZED PERSON SHALL ATTACH THE YELLOW EQUIPMENT DANGER TAG, AND FILL OUT FOR PC-75E-71, UNIT NUMBER, BUILDING NUMBER, TIME, DATE AND SUPERVISOR.
- E. WHEN MAINTENANCE PERSONNEL ARE READY TO WORK ON UNIT, THEY WILL FILL OUT FORM PC-75E-71, AMT NUMBER, TAG NUMBER, TAGGED BY, DATE AND TIME. EACH EMPLOYEE WORKING ON UNIT WILL FILL OUT THE FORM, TAKE A TAG AND IMMEDIATELY SECURE IT TO THE THROTTLE OF THE UNIT INVOLVED.
- F. UPON COMPLETION OF A JOB, THE TAG WILL BE RETURNED TO THE TAG BOARD AND THE TAG REMOVING INFORMATION WILL BE FILLED OUT. WHEN A JOB IS NOT COMPLETED AND THE EMPLOYEE IS LEAVING THE JOB FOR ANY REASON, A SPECIAL TAG WILL REPLACE THE REGULAR TAG ON THE UNIT. FORM PC-75E-71 WILL BE FILLED OUT AND INFORMATION REQUIRED FOR THE NEXT EMPLOYEE TO COMPLETE THE JOB WILL BE WRITTEN ON THE FORM. IF FOR SOME REASON THE UNIT CANNOT BE BUMPED, THIS WILL BE NOTED.

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- G. EXTREME CARE MUST BE EXERCISED IN ATTACHING AND REMOVING CLEARANCE TAGS. BE SURE THAT THE RIGHT TAG IS ATTACHED TO THE PROPER MACHINE AND BE SURE THAT THE RIGHT TAG IS REMOVED FROM THE PROPER MACHINE.
- H. WHEN THE P.H.S. SEES ON FORM PC-75E-71 THAT ALL THE TAGS ARE CLEARED, HE/SHE WILL CHECK TAG BOOK AND CLEAR AHT'S MAKING SURE THAT ALL WORK IS COMPLETED. AT THAT TIME THE UNIT WILL BE READY TO RETURN TO SERVICE.
- I. A MISCELLANEOUS CLEARANCE RECORD WILL BE USED FOR EQUIPMENT OTHER THAN A PARTICULAR UNIT, SUCH AS LIGHT SWITCHES, VENT FANS AND ETC. BE SURE TO FILL OUT COMPLETELY, GIVING SUFFICIENT INFORMATION FOR ANYONE TO KNOW WHERE THE TAG IS LOCATED AND WHY THE EQUIPMENT IS TAGGED OUT.
- J. CLEARANCE RECORDS WILL BE MADE OUT , ON UNITS THAT ARE TO BE SHUT DOWN FOR BRUSHES, BY THE SUPERVISOR THAT WRITES THE BRUSH TICKETS. THESE MAY BE KEPT IN THE SUPERVISOR'S OFFICE, SO WHEN HE/SHE COMES ON HE/SHE WILL KNOW THE NUMBER OF UNITS THAT WILL HAVE TO BE SHUT DOWN.

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- K. UNDER NO CONDITION WILL THE SPECIAL (YELLOW) TAG BE USED AS A CLEARANCE TAG.
 - L. KEEP CLEARANCE SHEETS IN EACH BUILDING AS THEY ARE CLEARED AND TURN THEM ALL IN TO BUILDING 9A AT END OF MONTH.
 - M. THE CLEARANCE TAGS ARE MADE IN FOUR COLORS AS FOLLOWS:
 - (1) BLUE - MECHANICAL
 - (2) RED - ELECTRICAL
 - (3) GREEN - PIPEFITTERS
 - (4) YELLOW - SPECIAL
2. NO ELECTRICAL EQUIPMENT IS TO BE WORKED ON "HOT" UNLESS APPROVED TO DO SO BY THE MAINTENANCE SUPERVISOR. RUBBER GLOVES, RUBBER BLANKETS, AND OTHER ELECTRICAL SAFETY EQUIPMENT ARE TO BE UTILIZED ON ALL WORK THAT IS TO BE PERFORMED ON OR NEAR "HOT" EQUIPMENT REGARDLESS OF THE VOLTAGE.

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SMEETING POWER MAINTENANCE AND OPERATING
DEPARTMENT SAFE PRACTICES

1. OILY RAGS MUST BE PLACED IN THE COVERED METAL CONTAINERS PROVIDED FOR THEM.
2. EXTREME CARE SHOULD BE EXERCISED WHEN HANDLING LONG SECTIONS OF PIPE OR TUBING TO PREVENT THEM FROM TOUCHING EXPOSED ELECTRICAL CONDUCTORS.
3. BEFORE STARTING ENGINE (NOT TAGGED) CHECK GENERATOR AND AROUND ENGINE TO BE SURE EVERYONE IS CLEAR.
4. STAND CLEAR OF BREAKERS AND STARTING CABINET WHEN STARTING ENGINE.
5. PERSONNEL USING WELDING OR CUTTING EQUIPMENT MUST PROVIDE PROTECTION AGAINST FIRES AND OTHER DAMAGE BEFORE BEGINNING WORK.

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3-15-76

APC 005490

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5-2-77

FIELD MECHANICAL MAINTENANCE DEPARTMENT
SAFETY RULES

A. PERSONAL PROTECTIVE EQUIPMENT

1. MONOGOGGLES MUST BE WORN WHEN OPERATING VALVES ON OR BREAKING INTO CHEMICAL AND PROCESS LINES. MONOGOGGLES MUST ALSO BE WORN WHEN OPENING UP ANY EQUIPMENT WHICH PREVIOUSLY CONTAINED CHEMICALS OR PROCESS LIQUIDS OR GASES. IN ADDITION, RUBBER GLOVES MUST BE WORN IF THE LINE OR EQUIPMENT CONTAINED ACID OR 50% CAUSTIC.
2. MONOGOGGLES AND DUST MASK MUST BE WORN WHEN GRINDING OR CUTTING ON FIBERGLASS.
3. FOR PROTECTION AGAINST CHLORINE GAS, WHEN WORKING IN THE CHLOR-ALKALI PLANT OR INGOT PLANT CHLORINE PIPING, ALL PERSONS MUST HAVE AN APPROVED RESPIRATOR WITH THEM. WHEN OPENING EQUIPMENT, BREAKING FLANGES OPEN, OR WORKING ON VALVES, UNDER THE FOLLOWING CONDITIONS, THE STATED BREATHING EQUIPMENT MUST BE WORN.

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- A. IF THE CHLORINE HAS BEEN EVACUATED, A FULL FACE MASK WITH A CANNISTER MUST BE WORN. AFTER THE ITEM IS OPEN AND THERE IS POSITIVE ASSURANCE THROUGH THE USE OF AN AMMONIA TEST THAT NO CHLORINE IS PRESENT, THE MASK MAY BE REMOVED.
- B. IF THE CHLORINE HAS BEEN PARTIALLY EVACUATED OR THERE IS A QUESTION OF EVACUATION, A FRESH AIR POSITIVE PRESSURE BREATHING SYSTEM MUST BE WORN. THIS EQUIPMENT MUST BE A FULL FACE MASK WITH A COMPRESSED AIR TANK SUPPLY OR A FULL FACE MASK WITH PLANT AIR FILTERED BY AN APPROVED ORGANIC FILTER (STOCK #690-290-0531) WITH PROPERLY REGULATED AIR PRESSURE.
- C. IF THE CHLORINE IS UNDER POSITIVE PRESSURE, A SUIT SPECIALLY DESIGNED FOR PROTECTION AGAINST ACIDS AND GASES MUST BE WORN. THE AIR SUPPLY MUST EITHER BE COMPRESSED BREATHING AIR OR PLANT AIR FILTERED BY AN APPROVED ORGANIC FILTER (STOCK # 690-290-0531), WITH THE AIR PRESSURE PROPERLY REGULATED.

APC 005492

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4-18-77

B. GENERAL

1. MECHANICAL MAINTENANCE EMPLOYEES MUST HAVE A THOROUGH KNOWLEDGE OF ALL SAFETY RULES PERTAINING TO THEIR AREA OF ASSIGNMENT BEFORE BEGINNING THE JOB.
2. NEVER BURN OR WELD ON ANY PIPELINE, VESSEL OR EQUIPMENT WHICH PREVIOUSLY CONTAINED FLAMMABLE LIQUIDS OR FLAMMABLE GASES UNTIL IT HAS BEEN PROPERLY PURGED AND CHECKED FOR COMBUSTIBLE GASES WITH AN EXPLOSI-METER. EXCEPTION IS GAS PRODUCTION PIPELINES WHICH ARE WELDED UNDER SLIGHT GAS PRESSURE.
3. NEVER BURN, CUT, OR WELD ON LOADED STRUCTURAL MEMBERS UNLESS APPROVED BY AN ENGINEER AND/OR INDICATED ON APPROVED DRAWINGS.
4. NEVER OPEN ANY PIPELINE, VESSEL, OR EQUIPMENT (EXCEPTIONS ARE STAND-ARD HOT TAPS AND PRACTICE OF DRAIN-ING AT PIPE CONNECTIONS) OR PERFORM ANY WORK WHICH COULD RESULT IN FAIL-URE OF SAME UNTIL YOU ARE SURE IT IS NOT UNDER PRESSURE AND HAS BEEN DRAINED.

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5. DO NOT OPERATE OVERHEAD CRANES UNDER THE SUPERVISION OF PRODUCTION DEPARTMENTS WITHOUT FIRST RECEIVING APPROVAL FROM THE DEPARTMENT SUPERVISOR.
6. THE FOLLOWING PRACTICES SHOULD BE FOLLOWED WHEN HOT BOLTING FLANGES (TAKING OUT ONE BOLT AT A TIME AND REPLACING WITH A NEW BOLT WHILE THE FLANGE IS IN SERVICE).
 - A. NO FLANGE SHALL BE HOT BOLTED WITHOUT THE MAINTENANCE UNIT SUPERVISOR'S APPROVAL.
 - B. IF THE FLANGE SERVICE IS OVER 110 PSIG AND 300°F, AN ENGINEERING ANALYSIS WILL BE REQUIRED TO DETERMINE THE SAFETY FACTORS INVOLVED. THE ENGINEER SHOULD PROVIDE THIS INFORMATION TO THE MAINTENANCE UNIT SUPERVISOR.
 - C. CAST IRON FLANGES SHOULD NOT BE HOT BOLTED.

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- D. FLANGES WITH LESS THAN 8 BOLT HOLES SHOULD NOT BE NOT BOLTED.
- E. THE SEAT FLANGE OF AN ALCOA VALVE SHOULD NOT BE NOT BOLTED UNLESS THE VALVE IS CRACKED OPEN.
- F. SAFETY APPAREL WILL INCLUDE MONOGOGGLES AS A MINIMUM. FACE SHIELD, RUBBER GLOVES, RUBBER BOOTS, AND A SLICKER SUIT OR APPROVED SUBSTITUTE SHOULD BE WORN IF CONDITIONS REQUIRE.

FIELD MECHANICAL MAINTENANCE SAFE PRACTICES

A. PERSONAL PROTECTIVE EQUIPMENT

1. IN ADDITION TO RUBBER GLOVES AND MONOGOGGLES, RUBBER BOOTS AND SLICKER SUIT OR AN APPROVED SUBSTITUTE SHOULD BE WORN WHEN BREAKING INTO ANY PIPELINE, VESSEL, OR EQUIPMENT WHICH CONTAINED ACID OR 50% CAUSTIC. IN ADDITION, A PORTABLE FLUSH TANK OR A WATER HOSE WITH FLOW MAINTAINED SHOULD BE IN THE WORK AREA FOR EMERGENCY WASH PURPOSES.

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B. GENERAL

1. MECHANICAL MAINTENANCE EMPLOYEES MUST HAVE A THOROUGH KNOWLEDGE OF ALL SAFE PRACTICES PERTAINING TO THEIR AREA OF ASSIGNMENT BEFORE BEGINNING THE JOB.
2. DO NOT STORE OR STACK MATERIALS IN AISLES OR PASSAGeways UNLESS ESSENTIAL TO PERFORM YOUR WORK. IF NECESSARY, ADVISE PRODUCTION SUPERVISOR AND INSTALL APPROPRIATE WARNING INDICATORS.
3. CLEAN UP AND MAINTAIN YOUR WORK AREA IN A CLEAN AND ORDERLY MANNER.
4. IF LOADS MUST BE SUSPENDED WHILE MAINTENANCE WORK IS BEING PERFORMED, THE LOAD SHOULD BE TIED OFF WITH STEEL CHOKERS FOR THE DURATION OF THE JOB AND SHOULD NOT BE LEFT HANGING FROM A CHAINFALL. (EXAMPLE BELT CONVEYOR COUNTERWEIGHT).

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5. WHEN PULLING BLINDS ON PIPELINES OR VESSELS, THE MECHANIC OR PIPEFITTER SHOULD TAKE A POSITION SUCH THAT THEY WOULD BE CLEAR OF ANY POSSIBLE SPRAY SHOULD THERE STILL BE PRESSURE ON THE LINE OR VESSEL.
6. A WEDGE SHOULD BE USED TO BREAK THE SEAL ON PIPELINE OR TANK FLANGES BEFORE REMOVING ANY FLANGE BOLTS. IN ADDITION, PRIOR TO BREAKING THE FLANGE SEAL, TAKE STEPS TO INSURE THE TANK OR PIPELINE DRAINS ARE NOT PLUGGED.
7. BEFORE WELDING OR BURNING ON ANY INSTALLED PIPELINE, VESSEL, OR EQUIPMENT, THE PRODUCTION DEPARTMENT SUPERVISOR IN THE AREA SHOULD BE CONTACTED.
8. NOTIFY THE TRAFFIC DEPARTMENT BEFORE BEGINNING WORK ON OR ALONGSIDE RAILROAD TRACKS.

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ELECTRICAL DEPARTMENT SAFETY RULES

1. HAVE A THOROUGH KNOWLEDGE OF AND FOLLOW ALL OPERATING DEPARTMENT SAFETY RULES.

ELECTRICAL DEPARTMENT SAFE PRACTICES

1. ONLY USE LINEMAN'S GLOVES THAT HAVE BEEN ELECTRICALLY TESTED WITHIN SIX MONTHS. REFER TO APPENDIX AA. AN AIR TEST SHOULD BE PERFORMED PRIOR TO USE EACH TIME.
2. ONLY USE SAFETY BELTS THAT HAVE BEEN INSPECTED WITHIN SIX MONTHS. REFER TO APPENDIX AA.
3. HAVE A THOROUGH KNOWLEDGE OF AND FOLLOW ALL OPERATING DEPARTMENT SAFE PRACTICES.
4. DO NOT STAND IN FRONT OF AN ELECTRICAL SWITCH WHEN OPERATING SAME.
5. DO NOT USE METAL MEASURING DEVICES WHILE WORKING ON OR NEAR ENERGIZED CIRCUITS OR APPARATUS. METALLIC FISHTAPE SHALL NOT BE FED TO OR FROM ANY ENCLOSURE CONTAINING EXPOSED ENERGIZED CIRCUITS.

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6. OPEN AND CLOSE SWITCHES IN A FIRM, POSITIVE, MANNER USING SUFFICIENT FORCE TO MAKE OR BREAK FULL CONTACT OF THE BLADES QUICKLY.
7. ALWAYS DETERMINE CIRCUIT STATUS AFTER OPENING A SWITCH EITHER BY VISUALLY CHECKING THE SWITCH BLADES OR MAKING APPROPRIATE VOLTAGE MEASUREMENTS. NEVER WORK ON A CIRCUIT AFTER ONLY CHECKING THE SWITCH HANDLE POSITION. EXTRA CAUTION MUST BE USED ON DUAL FEED CIRCUITS, BECAUSE THE FUSES MAY BE ENERGIZED EVEN WITH THE SWITCH OPEN.
8. USE AN APPROPRIATE FUSE PULLER TO REMOVE AND INSTALL FUSES. BREAK CONTACT WITH THE LINE SIDE OF THE CIRCUIT FIRST, AND INSERT FUSES IN THE LOAD SIDE OF THE CIRCUIT FIRST WHERE POSSIBLE.
9. PROTECT YOURSELF BY PLACING AN INSULATING MEDIUM BETWEEN YOURSELF AND GROUND OR GROUNDED APPARATUS TO KEEP ANY PART OF YOUR BODY FROM PROVIDING A PATH FOR ELECTRIC CURRENT WHEN WORKING ON ENERGIZED CONDUCTORS OR APPARATUS.

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10. BEFORE WORKING IN CLOSE PROXIMITY TO EXPOSED ENERGIZED CIRCUITS, DEVELOP WITH YOUR FELLOW WORKER CONTINGENCY PLANS FOR THE POSSIBLE BUT UNEXPECTED ACCIDENT SITUATIONS THAT MAY DEVELOP.

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INSTRUMENT DEPARTMENT SAFETY RULES

1. HAVE A THOROUGH KNOWLEDGE OF AND FOLLOW ALL OPERATING DEPARTMENT SAFETY RULES.

INSTRUMENT DEPARTMENT SAFE PRACTICES

1. HAVE A THOROUGH KNOWLEDGE OF AND FOLLOW ALL OPERATING DEPARTMENT SAFE PRACTICES.
2. ONLY USE SAFETY BELTS THAT HAVE BEEN INSPECTED WITHIN SIX MONTHS. REFER TO APPENDIX AA.

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CIVIL MAINTENANCE DEPARTMENT SAFETY RULES

HEAVY EQUIPMENT OPERATORS, TRUCK DRIVERS,
LABORERS

1. HAVE A THOROUGH KNOWLEDGE OF AND FOLLOW ALL OPERATING DEPARTMENT SAFETY RULES.
2. CHECK OVERHEAD CLEARANCE BEFORE DRIVING VEHICLE OR EQUIPMENT UNDER ELECTRICAL BUS, CABLE TRAYS, POWER LINES OR PIPE RACKS.
3. DO NOT DRIVE LARGE VEHICLES OR EQUIPMENT ACROSS OR THROUGH A & B PASSAGeways IN THE POTROOM WITHOUT A FLAGGER AND PERMISSION FROM A PRODUCTION SUPERVISOR.
4. DO NOT DRIVE LARGE VEHICLES OR EQUIPMENT ACROSS OR THROUGH C PASSAGeway IN THE POTROOM WITHOUT A FLAGGER.

GARAGE

SPECIAL TAG-OUT PROCEDURE:

- A. ANY VEHICLE BEING REPAIRED IN THE CONFINES OF BUILDING 37 OR R-111 WILL NOT REQUIRE A TAG TO INDICATE IT IS INOPERATIVE.

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- B. ANY VEHICLE DELIVERED TO BUILDING 37 OR R-111 IN AN UNSAFE CONDITION AND PARKED IN THE "READY TO WORK" AREAS WILL BE TAGGED IMMEDIATELY WITH A YELLOW TAG ON EITHER THE STEERING WHEEL OR IGNITION SWITCH. THIS WILL BE DONE ON VEHICLES WITH INOPERATIVE BRAKE SYSTEMS, ERRATIC OR INOPERATIVE HYDRAULIC SYSTEMS, BURNED WIRING, BROKEN STEERING SYSTEMS, OR OTHER SIMILAR MECHANICAL PROBLEMS THAT RENDER THE VEHICLE UNSAFE TO MOVE WITHOUT PRIOR KNOWLEDGE OF THE PROBLEM. THIS TAG WILL NOT BE REMOVED UNTIL THE MECHANIC HAS REPAIRED AND CHECKED OUT THE MALFUNCTION AND DETERMINED THE VEHICLE TO BE SAFE. THE MECHANIC MAY, HOWEVER, OPERATE THE UNIT FOR TEST OR OTHER NECESSARY REASONS WITH THE TAG ATTACHED.
- C. ANY VEHICLE BEING SERVICED IN THE FIELD SHALL BE "YELLOW DANGER TAGGED" BY THE MECHANIC OR HELPER WORKING ON THE UNIT AT THE TIME WORK IS STARTED AND SHALL NOT BE UNTAGGED UNTIL WORK IS COMPLETED ON THE JOB. THIS INCLUDES TIRE CHANGES.

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- D. THE YELLOW TAG, IN THE CASE OF MOTOR VEHICLES, IS GENERALLY USED TO STOP PEOPLE OTHER THAN THE ASSIGNED MECHANIC OR HELPER FROM OPERATING THE EQUIPMENT UNTIL IT HAS BEEN DECLARED SAFE.

CIVIL MAINTENANCE DEPARTMENT SAFE PRACTICES

HAVE A THOROUGH KNOWLEDGE OF AND FOLLOW ALL OPERATING DEPARTMENT SAFE PRACTICES.

HEAVY EQUIPMENT OPERATORS, TRUCK DRIVERS
AND LABORERS

1. NOTIFY THE TRAFFIC DEPARTMENT BEFORE BEGINNING WORK ON OR ALONGSIDE RAILROAD TRACKS.

PAINTERS AND SKILLED SERVICE HELPERS

1. WHEN SANDBLASTING IN AN AREA, SIGNS STATING SUCH MUST BE PLACED AROUND THE AREA.
2. WHEN FIBERGLASS APPLICATION IS IN PROGRESS, THE AREA AROUND THE OPERATION MUST BE BARRICADED OFF WITH SAFETY TAPE AND NO SMOKING, NO BURNING AND NO WELDING

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SIGNS WILL BE PLACED AT LEAST 50 FEET
FROM THE OPERATION.

3. WHEN APPLYING URETHANE FOAM, SIGNS
STATING "RESPIRATORS MUST BE WORN WHILE
IN AREA" WILL BE PUT UP WHEREVER A
PERSON MAY APPROACH THE OPERATION.
4. APPROVED RESPIRATORS MUST BE WORN BY
PAINTERS WHILE SPRAY PAINTING. OTHER
PERSONS, WHEN IN CLOSE PROXIMITY OF
SPRAY PAINT, MUST ALSO WEAR APPROVED
RESPIRATORS.

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APPENDIX AA

TOOLS AND EQUIPMENT REQUIRING DOCUMENTED INSPECTION

TOOL OR EQUIPMENT REQUIRING INSPECTION	INSPECTION INTERVAL	METHOD OF MARKING TO INDICATE INSPECTION
CABLE SLINGS	MONTHLY	(COLORED PANDUIT CABLE TIES) RED - JANUARY, MAY, SEPTEMBER BLUE - FEBRUARY, JUNE, OCTOBER GREEN - MARCH, JULY, NOVEMBER YELLOW - APRIL, AUGUST, DECEMBER NOTE: 1. INSPECTION OF ALL SLINGS MUST BE COMPLETED BE- TWEEN THE FIRST AND LAST DAY OF A SINGLE MONTH.

2. COLOR INDICATES MONTH IN
WHICH INSPECTION IS RE-
QUIRED.

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TOOL OR EQUIPMENT
REQUIRING INSPECTION

INSPECTION
INTERVAL

METHOD OF MARKING
TO INDICATE INSPECTION

3. IN ADDITION TO COLOR
CODE, EACH TIE WILL BE
MARKED WITH DATE RE-
INSPECTION IS REQUIRED.

SMALL HOIST
(CHAINFALLS, PULLERS
& PORTABLE ELECTRIC)

3 MONTH

(COLORED PANDUIT CABLE TIES)
RED - JANUARY, MAY, SEPTEMBER
BLUE - FEBRUARY, JUNE, OCTOBER
GREEN - MARCH, JULY, NOVEMBER
YELLOW - APRIL, AUGUST, DECEMBER
NOTE: 1. INSPECTION OF ONE-THIRD
(1/3) OF ALL HOISTS MUST
BE COMPLETED BETWEEN THE
FIRST AND LAST DAY OF A
SINGLE MONTH.

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TOOL OR EQUIPMENT REQUIRING INSPECTION	INSPECTION INTERVAL	METHOD OF MARKING TO INDICATE INSPECTION
SAFETY BELTS	6 MONTH	2. COLOR INDICATES MONTH IN WHICH INSPECTION IS REQUIRED. 3. IN ADDITION TO COLOR CODE, EACH TIE WILL BE MARKED WITH DATE RE- INSPECTION IS REQUIRED.
PORTABLE LADDERS (WOODEN & FIBERGLASS)	MONTHLY	WHITE PANDUIT CABLE TIE. TIE WILL BE MARKED TO INDICATE DATE ITEM IS DUE FOR REINSPECTION. SAME AS SLINGS.

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<u>TOOL OR EQUIPMENT REQUIRING INSPECTION</u>	<u>INSPECTION INTERVAL</u>	<u>METHOD OF MARKING TO INDICATE INSPECTION</u>
SCAFFOLDING	MONTHLY	SAME AS SLINGS.
LINEMAN'S GLOVES	6 MONTH	INSPECTION TAG ON GLOVE BAG AND MASTER RECORD.
AIRPAKS	MONTHLY	INSPECTION TAG AND MASTER RECORD.
FIRE EXTINGUISHERS	MONTHLY	INSPECTION TAG.

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<u>TOOL OR EQUIPMENT REQUIRING INSPECTION</u>	<u>INSPECTION INTERVAL</u>	<u>METHOD OF MARKING TO INDICATE INSPECTION</u>
VEHICLES	PRIOR TO SHIFT OF USE	INSPECTION SHEET.
EYE WASHERS & SAFETY SHOWERS	ONCE PER WEEK	INSPECTION TAG.
ELECTRICAL HAND TOOLS AND EXTENSION CORDS	SIX MONTHS	WHITE PANDUIT CABLE TIE. TIE TO BE MARKED TO INDICATE DATE ITEM DUE FOR INSPECTION.

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TAGOUT AND LOCKOUT REGULATIONS

PURPOSE

The intent of the tagout/lockout regulations is to secure equipment or materials from unwanted or unexpected movement or operation that might endanger personnel or damage equipment. This is generally accomplished by isolating mechanically or electrically the prime movers such as pumps, motors, distribution lines, etc. Though not always practical, the concept of approaching "zero energy state" should be considered when performing tagging/locking out. That is to say the prime movers are properly isolated and that any stored mechanical energy is released or secured.

DEFINITIONS

1. Tagout is the act of placing a switch, lever, valve, gate, or other isolating device in the OFF position and tagging it to indicate that it must not be placed in the ON position until tags have been properly removed. The types of tags in our operation are as follows:
 - A. Equipment tags are used by personnel to indicate equipment is NOT to be operated. Production supervisors and specially authorized personnel, since they are recognized as being the most knowledgeable of the area requiring work, will lead tag an area where work is to be performed to indicate what is secured for the job. In turn, those performing work must then tagout the equipment with their appropriate equipment tag and personal tag before performing work.
 1. The YELLOW EQUIPMENT DANGER TAG shall be used for EQUIPMENT protection only. It provides space for describing

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the reason for tagging the equipment, the name and department of the individual attaching the tag and the date. This tag shall be securely attached to the proper isolating device (main switch, valve, gate, or other isolating device) to prevent the operation of equipment when it is to be inoperable. Never use this tag for personal protection. Production supervisors or other specially authorized personnel shall see that all machinery and equipment are maintained in a safe condition or tagged out with a YELLOW EQUIPMENT DANGER TAG or an ORANGE EQUIPMENT DANGER TAG when unsafe.

2. The ORANGE EQUIPMENT DANGER TAG shall be used on valves, switches, etc. when that equipment is to be left nonoperable opposite to that defined on a YELLOW EQUIPMENT DANGER TAG. ORANGE EQUIPMENT DANGER TAGS may only be used on open valves or closed electrical switches (i.e., the coil shorting switches in Chlor-Alkali). There are situations where valves should remain in the open position on pipelines or air-operated equipment to vent, pressure relieve, or divert flow to safely protect equipment or personnel. Never use this tag for personal protection.

B. Personnel Tags

1. The WHITE PERSONAL DANGER TAG shall be used for personnel safety only. It

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provides space for the signature of the person doing the work, the department, and date. This tag shall be securely attached to the isolating device (main switch, valve, gate, or other isolating device) when in the OFF position before any maintenance, cleaning, repair, or adjustment is performed on equipment.

2. WHITE AND GREEN GROUP DANGER TAGS may be utilized where crew size, job duration, and number of devices to be tagged make the use of WHITE PERSONAL DANGER TAGS impractical and the job can be safely performed. A responsible and knowledgeable supervisor may attach his/her WHITE AND GREEN GROUP DANGER TAG to the main power switch, closed valve, or other protective device to cover all personnel required to perform the work. This will be done with the acknowledgement of each crew member and any member may also attach their WHITE PERSONAL DANGER TAG if they so desire.

When working under the WHITE AND GREEN GROUP DANGER TAG, the responsible supervisor shall designate a specific valve or switch as a "Designated Tagging Point" and will post at this point a list of those devices which have been isolated. The "Designated Tagging Point" shall be used by the crew members to attach their personal danger tags in addition to the

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supervisor's group tag. All personal danger tags will be attached and removed as specified for WHITE PERSONAL DANGER TAGS. This tagging point will ensure crew participation and additionally give the responsible supervisor a control check of his/her employees when the group danger tags are to be removed. For vessel entry the "Designated Tagging Point" will be the vessel entry permit.

NOTE: THE INDIVIDUAL TAGOUT/LOCKOUT IS THE BASIC RULE AND PRACTICE. THE GROUP TAGOUT PROCEDURE IS THE EXCEPTION.

- II. Specially Authorized Personnel are those persons who have been trained by their supervisor in the proper way to shutdown and tagout/lockout specific operation equipment. Department superintendents must complete Point Comfort Form #PC-1430-77, "Tagout/Lockout Authorization For Yellow or Orange Equipment Danger Tags" before the individual or job classification is considered specially authorized. This form must be on file in the Point Comfort Operations "Special Operating Procedures" book.

- III. Lockout is defined as the act of padlocking a switch, lever, or other isolating device in a de-energized position. Locks shall be used in addition to, but not as a substitute for, danger tags to secure switches in the open position. A lock shall be installed on an open power switch with the initial YELLOW EQUIPMENT DANGER TAG. Installation of additional YELLOW EQUIPMENT DANGER TAGS ~~does not~~ necessitate installation of additional locks. The locks shall be removed subsequent to removal of the last YELLOW EQUIPMENT DANGER TAG.

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When circuit breakers are used as the disconnecting means for electrical power, the use of tags only will suffice since most breakers are not designed to be locked. Additionally, for cord connected equipment, the tags shall be attached to the controlling switch and the cord unplugged from the receptacle.

- IV. Isolating Device is an electric circuit breaker, a disconnect switch, a manually operated switch or valve, a slide gate, a slip blind or a "Figure 8" blind for blanking off piping, or similar device. Control circuits (pushbuttons, toggle switches, and pressure switches and similar devices) shall not be considered to be isolating devices.
- V. Try means pushbutton attempt to operate in addition to lock and tagout. When the disconnecting device has been locked out/tagged out try to start the isolated equipment by means of the control circuit or pushbutton to ensure that the main disconnect is de-energized and is functioning properly.

Procedures

- I. In the Alumina and Chemicals area of our plant, the production supervision is considered the most knowledgeable personnel to safely shutdown and secure operating facilities for maintenance, cleanup, repairs, etc. Maintenance and engineering supervision are considered the most knowledgeable personnel in their areas of control such as power houses, machine shops, plant electrical distribution lines, and equipment and facilities under construction that have not been turned over to a production department. The production supervisor or specially authorized person will initially shutdown and secure the operating equipment and will lock and tag the isolating devices with a YELLOW or ORANGE EQUIPMENT

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DANGER TAG. If maintenance personnel are required, each craft shall attach an additional YELLOW EQUIPMENT TAG. Maintenance may attach an additional ORANGE EQUIPMENT TAG. This joint tagging effort is intended to both control and communicate the safe work zone for the work required.

- II. Each employee, before doing work in which they could be endangered by equipment movement or flow of materials through pipelines, shall attach his/her own personally signed WHITE PERSONAL DANGER TAG to the perviously attached YELLOW EQUIPMENT TAG tagged main switch, valve, gate, or other isolating device. All WHITE PERSONAL DANGER TAGS must be signed and department indicated.

Special Rule for Tagging of Blinds:

Under most conditions it is not considered necessary to place danger tags on pipeline blinds to perform maintenance work. Blinds must be tagged, however, when set for vessel entry. In addition, blinds which are remote from the work area and which are subject to the potential of being pulled without knowledge of those doing maintenance work shall be tagged. This should be determined by the production supervisor when placing the initial YELLOW EQUIPMENT DANGER TAGS.

- III. After equipment is initially shut down and tagged and locked, the controls shall be TRIED to ensure that the equipment is de-energized and safe to work on.
- IV. Maintenance procedure sometimes requires multiple starts and stops of equipment for set up, adjusting, or testing. Under no circumstances will valves, switches, etc. be operated with danger tags attached. The production supervisor or specially authorized person may give maintenance personnel

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written authorization to start/stop the equipment without further production tagging by initialing and dating the maintenance YELLOW EQUIPMENT DANGER TAG when additional testing is required. The tagout/lockout procedure shall be followed between each test. Upon completion of the testing, the last maintenance department personnel to remove his/her danger tags will notify the production supervisor who will then assume equipment responsibility.

When equipment can not be tested, set up, or adjusted within the intent of the tagout and lockout regulations, a written procedure, approved by the maintenance and production supervisors, must be used in these cases to properly safeguard all others who may be subject to the hazards of the operation. (Examples: thickener rakes, sparge arms, etc.)

NOTE: Supervisor means mechanical maintenance supervisor, production supervisor-clarification, civil maintenance and shops supervisor, etc.

- If, at the conclusion of the testing period, the equipment is still to remain inoperative, YELLOW or ORANGE EQUIPMENT DANGER TAGS and locks shall be replaced by the employee or supervisor involved.
- V. A WHITE PERSONAL DANGER TAG may be removed only by the person who attached it or by a supervisor or individual specifically authorized by the supervisor in an individual situation in the same craft or department as the individual to whom it belongs who has a thorough knowledge of the personnel, process, and equipment involved and can thereby safely accept the responsibility for removing the tag. If an individual leaves the job before the work is complete, either because he/she

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has been assigned to another job or because his/her shift is over, he/she shall remove his/her WHITE PERSONAL DANGER TAG(S), but leave the YELLOW or ORANGE EQUIPMENT DANGER TAG(S) in place, thereby to inform and protect oncoming shift personnel relative to the incomplete status of the repair.

A YELLOW or ORANGE EQUIPMENT DANGER TAG may be removed only by the person who installed it or by a production or maintenance supervisor in the same department as the supervisor who installed it, or by specially authorized personnel in the same craft to which it pertains.

A GREEN AND WHITE GROUP DANGER TAG does not require a removal until the completion of the job.

However, it is the responsibility of the supervisor of the unit or crew to make sure tags/locks remain secure and a safe work area prevails. The WHITE AND GREEN GROUP DANGER TAG may be removed only by the supervisor who attached it or by a supervisor in the same craft or department as the individual to whom it belongs who has a thorough knowledge of the personnel, process, and equipment involved and can thereby safely accept the responsibility for removing the tag.

- VI. When applying the Tagout and Lockout Regulations to the Entry Procedure for Tanks, Vessels, or Confined Spaces, consideration must be given to further securing personnel safety in certain cases.

For equipment such as slurry mixers, horizontal digesters, ball mills, etc., which are large enough for personnel to enter and be caught in moving parts, danger tags and locks alone shall not be considered sufficient protection. This equipment shall be danger tagged and locked out in the prescribed manner and the drives mechanically disconnected or restrained from movement as an added precaution.

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VII. Production supervisors in the Smelting Power Department shall use YELLOW EQUIPMENT DANGER TAGS (and locks as appropriate) to secure equipment. This department is the only department authorized to use color-coded personal danger tags to identify crafts and operating personnel. Refer to Smelting Power Department Operating and Maintenance Department Safety Rules.

VIII. Any vehicle being repaired in the confines of Buildings 29, 37, or K-111 will not require a White Personal Danger Tag.

Any vehicle determined to be in an unsafe condition will be tagged immediately with a yellow tag on either the steering wheel or ignition switch. This will be done on vehicles with inoperative hydraulic systems, burned wiring, broken steering systems, or other similar mechanical problems that render the vehicle unsafe to move without prior knowledge of the problem. This tag will not be removed until the mechanic has repaired and checked out the malfunction and determined the vehicle to be safe. The mechanic may, however, operate the unit for test or other necessary reasons with the tag attached.

Any vehicle being serviced in the field shall be "Yellow Danger Tagged" by the mechanic or helper working on the unit at the time work is started and shall not be untagged until work is completed on the job. This includes tire changes.

The yellow tag, in the case of motor vehicles, is generally used to stop people other than the assigned mechanic or helper from operating the equipment until it has been declared safe.

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IX. The RED PORTABLE POTROOM GROUND TAG shall be used in the following manner:

- A. The two-part red tag shall be used to tag the closed portable ground.
- B. The supervisor for each crew using the protection of the closed portable ground shall fill in the tag and the attached stub completely.
- C. The supervisor shall tear off and retain the stub and give the tag to the crew leader or specially authorized person to attach to the closed portable ground.
- D. When each crew has finished work requiring the closed portable ground, the person who attached the tag shall remove and fill in the back of the tag and return it to the supervisor.
- E. When each supervisor has paired all of the stubs with tags returned by the crews, the coordinating supervisor shall be notified that the crew is clear.
- F. When the coordinating supervisor has determined that all crews using the protection of the portable ground are clear, the electrical maintenance supervisor or specially authorized person shall be notified to open the portable ground.
- G. The electrical maintenance supervisor or specially designated person shall open the portable ground in accordance with the proper procedure.

UNDER NO CIRCUMSTANCES WILL
THE GROUNDING DEVICE BE OPENED
WHILE A TAG REMAINS ON IT OR AN
EMPLOYEE IS WORKING IN THE
PROTECTED AREA.

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ENTRY PROCEDURE FOR TANKS, VESSELS OR CONFINED SPACES

Purpose

The vessel entry procedure is used to provide employees a safe working environment while working in confined spaces, tanks or vessels. The key foundation of vessel entry is the tag-out/lock-out procedure with additional requirements for air quality and mandatory disconnecting/removal or blinding of all feed or discharge lines.

Definitions

1. The ENTRY PERMIT shall be issued by the production supervisor for those tanks or vessels for which he/she is the "proprietor". It will indicate the class of vessel, duration and nature of work, air sampling data, and any additional personal protective requirements. The permit shall be displayed at the designated entrance to the vessel.
2. A written ENTRY PROCEDURE is required for each vessel and confined space entry. This procedure shall describe all pre-entry requirements (notifications, tag out/lock out, blinding, etc.), internal hazards, and any required safety precautions and equipment. This procedure must be approved by the department superintendent and may not violate plant tag out/lock out or vessel entry procedures. A simple schematic diagram or check list indicating valves, pumps, blind locations, etc. that require tag out should be made for each written vessel entry procedure. The written procedure and drawings must be filled in the Point Comfort "Special Operating Procedures" book. The diagram or check list should be posted with ENTRY PERMIT.
3. VESSEL CLASSIFICATION will be determined to fit one or more of the following classes:
CLASS A For confined spaces that have stored flammable or explosive dust or gases, or asphyxiating chemicals, or a hazardous concentration or residue remaining in the vessel.

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- CLASS B** For confined spaces that have consumed or produced a flammable, explosive, or asphyxiating gas or dust, and these products have not left a hazardous concentration or residue.
- CLASS C** For confined spaces that have contained acidic or alkaline chemicals.
- CLASS D** For confined spaces that have vertical or maze exits.
- CLASS E** For confined spaces that contain loose dust, fluidized materials, or unstable solids.
4. **AIR SAMPLE** requirements will be designated on the entry procedure and entry permit. A minimum oxygen level of 19.5% is required. Depending on the vessel class, combustible mixture, asphyxiating gases, and carbon monoxide sampling may also be required. Air samples will be taken by the Industrial Hygiene Department or a designated trained supervisor in the proprietary department. Based on experience, some vessels have been given an exemption from air sampling by the Industrial Hygiene Department as this will be noted on the written **ENTRY PROCEDURE**.
5. An **OUTSIDE OBSERVER** is required for some specific vessel entries. In case of emergency, it is the observer's job to summon aid immediately, to attempt to remove the victim by use of the lifeline and to perform all other rescue functions from the **OUTSIDE**. The outside observer must **NEVER** enter the tank until he/she is relieved from his/her post.
- PROCEDURE**
1. Prior to the issuing of an **ENTRY PERMIT** the entire job must be evaluated for hazards. The written **ENTRY PROCEDURE** required in preparation for issuing the entry permit will detail which lines require blinding or disassembly, drives that must be

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tagged, locked and disconnected, etc. The production supervisor (proprietor) must attach a Green and White Group Tag to all blinds, disconnect switches and insure that proper air quality exists before the entry permit is signed and posted. The signed entry permit is permission to work within a confined space and is a guarantee by the issuer(s) that the appropriate tagging, blinding, etc. has been completed. If maintenance personnel are required to perform work within the confined space, the maintenance supervisor may decide to additionally group tag blinds, etc. and must then co-sign the entry permit with the production supervisor. Though not required, employees may use their individual White Personal Danger tags on the isolating devices previously group tagged by issuer(s) of the entry permit. Maintenance and engineering supervision are considered the proprietors in their areas of control, such as powerhouse, storm sewers, machine shops and equipment and facilities under construction that have not been turned over to a production department.

- II. All employees entering the confined space or vessel at the designated entrance point shall attach his/her own personal White Danger Tag to the entry permit. If an individual leaves the job before work is complete—either because their shift is over or they are assigned to another job—they shall remove their White Personal Danger Tag.
- III. Upon completion of the required work within the vessel or confined space, the issuer(s) of the entry permit will verify that all White Personal Danger Tags have been removed from the entry permit board and make any additional checks to satisfactorily determine all employees are clear of

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the confined space. The designated entry point must be closed to prevent re-entry of personnel. After the entry point has been closed, the issuer(s) shall remove the entry permit. Only after the entry point is closed and the entry permit removed may the supervisor's White and Green Group Tag and Yellow Equipment Tags be removed from the isolating devices. Under no circumstance may an entry permit be withdrawn while an employee's White Personal Danger Tag is attached to the entry permit. Removal of White Personal Danger Tags and Green and White Group Tags must follow the tag out/lock out procedures.

- IV. The written procedure is designed to identify the unique requirements for each vessel or confined space entry. The following are general requirements for all confined space entry as well as some additional specific requirements by vessel classification.

GENERAL REQUIREMENTS

- A. All feed and discharge lines shall be disconnected, dropped or blinded. Since valves can and do leak, blinds are used to achieve positive isolation and the PERSONAL DANGER TAGS must be attached to the blinds.
1. If the contaminant has a neutral pH or a large volume of water may flood the vessel by gravity feed, an inflatable seal may be used to isolate flow (for example, sewers or outfalls).
 2. When an entire process unit comprised of interconnecting vessels such as a digester is shut down and the feed and discharge lines for the entire unit are dropped or blinded, it may not be necessary to blind the interconnecting lines to each vessel.

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prior to entry. The written entry procedure will specify all requirements.

3. Air ducts on the kilns, coolers and calciners, open ended vent lines and overflow lines that will not allow back feed to the confined space do not require blinding.
4. Boiler design is such that total blinding cannot be accomplished. The written Entry Procedure properly covers all needed requirements for isolating and venting lines.
5. All agitating equipment must be tagged, locked and disconnected by coupling, belt or motor leads.
Exceptions are as follows:
 1. When testing slow moving equipment not exceeding 10 revolutions per hour.
 2. Disconnecting rod mills using the tag out/lock out procedures.
6. All feed chutes must be disconnected and dropped or feed equipment locked out and tagged. This applies only to feed equipment other than valves.
7. Burning/welding torches must be removed from the confined space when they are not in use.
8. No gas cylinders may be placed inside the confined space.
9. Personal protective equipment such as slicker suits, face shield, ear plugs, etc. shall be worn as required by the nature of the job.
10. Vessels that could accidentally rotate must be secured from doing so.
11. Ladders or platforms used for entry must be secured to prevent the ladder or platform from falling. Plant tie-off and safety belt rules are to be observed.

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- I. When lifelines are required, they must be secured to a structure adequate to support the person.
- J. Due to the potentials of shock hazard in damp or metallic enclosures, all electrical tools, extension cords, temporary lights must be approved by the Electrical Department.
- K. If air samples must be taken inside the vessel before a permit is issued, a continuous supply air mask, rescue harness and lifeline must be worn by sampler and an outside observer present.
- L. If, because of inadequate ventilation, a hazardous atmosphere could collect during the performance of welding, cutting, painting, or other work, a continuous supply or pressure/demand air mask must be worn and, additionally, the vessel classification will change.

SPECIFIC ADDITIONAL REQUIREMENTS

CLASS A CONFINED SPACES

If the confined space has stored flammable or explosive gas or dusts or asphyxiating chemicals or a hazardous concentration or residue remains in the vessel, the following procedures are to be followed:

- A. The vessel atmosphere must be sampled for flammable or explosive concentrations, asphyxiating gases, and oxygen content. Sampling results shall indicate safe levels before the entry permit is issued.
- B. If the vessel is to be cleaned to remove a flammable or explosive atmosphere, water or steam should be used.
 - 1. There shall be no free fall of water unless the equipment, such as nozzles or hoses are electrically bonded to the vessel.

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2. Steam shall always be introduced above the level of any liquid contained in the vessel.
3. All electrical power equipment and hand tools shall be approved for use in flammable or explosive atmospheres.
- C. If the vessel must be purged:
 1. Gases which are lighter than air shall be purged using an inert gas or air introduced at the BOTTOM of the vessel. They shall be purged out through a discharge point at the TOP of the vessel.
 2. HEAVY gases shall be purged using an inert gas or air introduced at the TOP of the vessel. They shall be purged out through a discharge point at the BOTTOM of the vessel. Exceptions are those vessels which, due to the hazardous material they contain, are designed with outlets only on the top, thus eliminating spillage of their contents due to failure at these outlets during normal operations.
 3. Sampling shall be made during the purge. When the air inside the confined space reaches a point of stabilization, it shall be held at this point for at least one hour before a permit is issued.
- D. Additional samples shall be taken as required on the entry permit.
- E. An outside observer must be present and in position to observe work inside the vessel at all times and a procedure must be established for the observer to signal or communicate with other employees for assistance in case of an emergency.
- F. There must be at least one procedure/demand or

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continuous supply air must be available for emergency use at the point of entry.

- G. Harnesses must be worn by everyone entering the vessel. If one person enters the vessel, a lifeline must be attached to that person's harness. If two or more people enter the vessel, a lifeline need not be attached to the harness but must be in the vessel and attached to a point outside the vessel for removing a disabled employee from within the vessel.

CLASS B CONFINED SPACES

If the vessel has consumed or produced a flammable, explosive, or asphyxiating gas or dust, and these products have not left a hazardous concentration or residue inside the vessel, the following procedures are to be followed:

- A. The vessel atmosphere must be sampled for flammable or explosive concentrations, and asphyxiating gases, carbon monoxide, and oxygen content to see if they are present. Sampling results shall indicate safe levels before the Entry Permit is issued.

CLASS C CONFINED SPACES

If the vessel has contained acidic or alkaline chemicals, the following procedures are to be followed:

- A. The written procedure for vessel entry shall specify whether or not air sampling is required prior to entry. This requirement shall be determined for each vessel by the plant Industrial Hygienist. Testing must be done prior to entry until the Industrial Hygienist specifically has exempted the vessel from routine sampling.
- B. Protective clothing must be worn until the acid or alkali has been removed or neutralized.

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CLASS 2 CONFINED SPACES

If the vessel has a vertical or man unit, the following procedures are to be followed:

- A. A procedure must be established for the employee(s) entering the vessel to signal or communicate with other employees for assistance in case of an emergency.
- B. When a vertical entry is made, a rescue harness, wrist straps, or other appropriate means of removing a disabled person must be adjacent to the point of entry.

CLASS 3 CONFINED SPACES

If the vessel or confined space contains fumes, dust, or fluidized material or unstable solids which could allow an employee to be entrapped or sink to the point of suffocation, the following procedures are to be followed:

- A. An outside observer must be present.
- B. A procedure must be established for the observer to signal or communicate with other employees for assistance in case of an emergency.
- C. All persons entering the vessel must wear a rescue harness and lifeline.
- D. If the material inside the vessel or confined space is no greater than wrist deep at any point, the use of body harness, lifeline, and outside observer are not mandatory.

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CLASS D CONFINED SPACES

IF THE VESSEL HAS A VERTICAL OR MAZE EXIT
THE FOLLOWING PROCEDURES ARE TO BE FOLLOWED:

- A. ALL APPLICABLE GENERAL REQUIREMENTS
MUST BE FOLLOWED.
- B. A PROCEDURE MUST BE ESTABLISHED FOR THE
PEOPLE INSIDE AND OUTSIDE OF THE VESSEL
TO COMMUNICATE.
- C. WHEN A VERTICAL ENTRY IS MADE, APPRO-
PRIATE MEANS OF REMOVING A DISABLED
PERSON FROM WITHIN THE VESSEL MUST BE
PLACED AT THE POINT OF ENTRY.

CLASS E CONFINED SPACES

IF THE VESSEL CONTAINS LOOSE OR DUSTY
MATERIAL, FLUIDIZED MATERIAL, OR UNSTABLE
SOLIDS, THE FOLLOWING PROCEDURES ARE TO
BE FOLLOWED:

- A. ALL APPLICABLE GENERAL REQUIREMENTS
MUST BE FOLLOWED.
- B. AN OUTSIDE OBSERVER MUST BE PRESENT
AND IN POSITION TO OBSERVE WORK IN-
SIDE THE VESSEL AT ALL TIMES. THE
OBSERVER MAY ASSIST THE PEOPLE IN-
SIDE AS LONG AS THE OBSERVER DOES
NOT ENTER THE VESSEL OR LEAVE THE
OBSERVATION STATION.

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C. A PROCEDURE MUST BE ESTABLISHED FOR
THE OBSERVER TO SIGNAL OR COMMUNICATE
WITH OTHER EMPLOYEES FOR ASSISTANCE
IN CASE OF AN EMERGENCY.

D. ALL PERSONS ENTERING THE VESSEL MUST
WEAR A RESCUE HARNESS AND LIFELINE.

APC 005534

SAMPLE
Entry Permit
-front-

CONFINED SPACE ENTRY PERMIT

PERMISSION TO ENTER THIS SPACE GIVEN BY -

PERMISSION TO ENTER THIS CONFINED SPACE IS AUTHORIZED BY THE COM-
PLETION OF THIS PERMIT. IT IS FOR THE DURATION OF THE WORK OUT-
LINED BELOW. THIS PERMIT IS VALID FOR THIS VESSEL ONLY.

CONFINED SPACE LOCATION

TYPE OF WORK

SUPERVISOR OF WORK

DATE OF FIRST ENTRY

ESTIMATED LENGTH OF WORK

THIS CONFINED SPACE CONTAINED

THIS CONFINED SPACE IS CLASSIFIED A B C D E
(CIRCLE ONE OR MORE)

A-STORES FLAMMABLE OR EXPLOSIVE DUST/GAS D-VERTICAL OR NAZE EXIT
B-CONSUMES FLAMMABLE OR EXPLOSIVE DUST/GAS E-LOOSE OR UNSTABLE
C-CORROSIVE CHEMICALS DUSTS OR SOLID

APC 005535

SAMPLE Entry Permit -back-

BELOW IS A CHECK LIST FOR ENTERING THIS CONFINED SPACE. BEFORE ENTRY IS MADE, CHECK THE ITEMS NEEDED TO PERFORM WORK SAFELY.

☐ BREATHING AIR EQUIPMENT	☐ INSIDE COMMUNICATION
☐ RESCUE HADRESS AND LIFELINE	☐ INSIDE ALARM
☐ OUTSIDE OBSERVER	☐ OUTSIDE ALARM
☐ HEARING PROTECTION	☐ HEAT PROTECTIVE CLOTHING
☐ AIR SAMPLER	☐ BONDED AND/OR GROUNDED LINES
☐ LOW VOLTAGE POWER TOOLS	☐ CHEMICAL PROTECTIVE CLOTHING
☐ OTHER -	☐ OTHER -

IF REQUIRED: AN AIR SAMPLE HAS BEEN TAKEN AT _____ (TIME AND DATE)
OF THE AIR INSIDE THIS CONFINED SPACE.
ADDITIONAL SAMPLES REQUIRED EVERY _____ HOURS.
THE FLAMMABLE GAS LEVEL WAS _____
THE CARBON MONOXIDE LEVEL WAS _____
THE TOXIC MATERIAL CONCENTRATION WAS _____
THE OXYGEN LEVEL WAS _____

AD-1
9-20-77

WELDING AND BURNING PERMIT PROCEDURES

1. A WELDING PERMIT, FORM SF-4744, IS TO BE ISSUED TO THE INDIVIDUAL PRIOR TO PERFORMING A WELDING, BURNING, SAND BLASTING, CHIPPING OR JACK HAMMERING JOB IN CERTAIN SPECIFIED AREAS OF THE PLANT.

THE FOLLOWING AREAS ARE DESIGNATED AS RESTRICTED AREAS WHERE A WELDING PERMIT IS REQUIRED:

GAS PLANT

ALL THE AREA DEFINED AS GAS PLANT OPERATIONS EXCEPT BUILDING 201, DEFINED AS A SHOP AREA ESPECIALLY FOR CUTTING AND WELDING. THIS INCLUDES GASOLINE LOADING DOCK.

SMEETING PLANT

BUILDINGS - 67D, 57 AND 9 OIL HOUSE AND OIL STORAGE AREA.

FASTE PLANT - BUILDINGS 52, 52A, 53, 54, 54A, 54D, 54F WEST END, 55A & B INCLUDING PITCH STORAGE AREA.

APC 005537

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STORAGE BUILDING - 13A, 13B (PAINT SHOP),
15, 15A, 15B, 101 (STORAGE AREA).

POTROOMS - ABOVE CABLE TRAY IN B PASSAGE-
WAY.

BUILDING 19 - STRUCTURAL CEILING AREA AND
COOLING TOWERS.

REFINING PLANT - CHLOR-ALKALI AREA--
(PERMIT HAS TO BE APPROVED BY CHLOR-ALKALI
SUPERVISION)-- VESSELS IN BUILDING R-6,
R-8, R-35 CAUSTIC WASH TANK, R-45 CAUSTIC
CLEANING VAT AREA, R-51A, R-137, R-141
(STORAGE AREA) R-143, R-144, R-52 ACID
TANKS, R-83 OLEUM TANKS, R-115 SEWER DIS-
POSAL PLANT, R-36 ANTI-FREEZE TANK, R-10
ACID DOCK, GAS REDUCING STATIONS OF R-50,
R-55, AND R-60, R-70 UNLOADING PIT AND
RECLAIM PIT, GASOLINE PUMPS, FOAM INSULATED
TANKS, RUBBER LINED TANKS, AND SHIPS.

ALL COOLING TOWERS.

NEVER WELD OR BURN ON BALL MILL, POT-
LINING SLURRY TANK, OR LEACH TANKS
BEFORE A BURNING PERMIT IS ISSUED.

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ALL OTHER AREAS IN THE PLANT ARE CLASSIFIED AS LOW FIRE HAZARD AREAS AND NO PERMIT IS REQUIRED. IN THESE AREAS PRECAUTIONS TO INSURE AGAINST A FIRE MUST BE TAKEN EVEN THOUGH A PERMIT IS NOT REQUIRED. IN THE JUDGEMENT OF THE WELDER OR SUPERVISOR, IF A FIRE HAZARD EXISTS, THE AREA MUST BE CLEANED BEFORE WORK IS STARTED.

2. AUTHORIZED TO ISSUE WELDING PERMITS:
 - A. MAINTENANCE SUPERVISION IN CHARGE OF WELDER.
 - B. DEPARTMENT SUPERVISION WHERE WORK IS TO BE PERFORMED.
3. PROCEDURES FOR ISSUING WELDING AND BURNING PERMIT:
 - A. NO PERMIT IS TO BE ISSUED UNTIL THE NECESSARY PRECAUTIONS TO INSURE FIRE SAFETY HAVE BEEN TAKEN.
 1. AREAS AROUND AND UNDER THE WORK AREA MUST BE CLEAN AND FREE OF COMBUSTIBLE MATERIAL.

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2. EQUIPMENT OR ITEMS OF COMBUSTIBLE MATERIAL THAT CANNOT BE MOVED MUST BE PROTECTED BY WHATEVER MEANS NECESSARY TO ELIMINATE THEM AS A FIRE HAZARD AND KEEP THEM FROM BEING DAMAGED.
 3. WHEN NECESSARY, FIRE EQUIPMENT SHOULD BE ON STANDBY IN THE AREA WITH OPERATORS FAMILIAR WITH ITS USE.
 4. IN HIGHLY FIRE HAZARDOUS AREAS, A PLANT PROTECTION REPRESENTATIVE MAY BE REQUESTED TO STANDBY WITH LARGER FIRE PROTECTION EQUIPMENT.
- B. THE MAINTENANCE SUPERVISOR IN CHARGE OF THE WORK WILL FILL OUT THE PERMIT AND SIGN HIS/HER NAME IN THE BLANK FOR "SUPERVISOR". THE PERMIT MUST THEN BE SIGNED BY A DEPARTMENTAL SUPERVISOR IN WHOSE AREA THE WORK IS BEING PERFORMED OR BY THE RESPONSIBLE OFFICER OF THE SHIP FOR WORK ON BOARD SHIP.

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- C. THE STUB PORTION OF THE PERMIT IS RETAINED BY THE ORIGINATOR AND THE PERMIT IS GIVEN TO THE OPERATOR OF THE WELDING EQUIPMENT.
- D. IMMEDIATELY AFTER ISSUING A PERMIT THE ORIGINATOR WILL DIAL STA. 2288 (MAIN GUARD GATE) TO HAVE THE PERMIT RECORDED.
- E. WHEN THE WORK IS COMPLETE AND THE WELDING EQUIPMENT OPERATOR HAS INSPECTED THE WORK AREA FOR SMOLDERING FIRES, THE PERMIT IS RETURNED TO THE ORIGINATOR WHO WILL FILL IN THE "FINISHED TIME", STAPLE THE STUB TO THE PERMIT AND SEND TO GATE 3 MAIN GUARDHOUSE BY PLANT MAIL.
- F. PLANT PROTECTION WILL PERIODICALLY CHECK THE AREAS WHERE WELDING AND BURNING WORK IS BEING PERFORMED FOR VALID PERMITS AND TO SEE THAT PRECAUTIONS AGAINST FIRE HAVE BEEN CARRIED OUT.

AE-1
06-27-79

POTABLE WATER TIE-IN PROCEDURE

- 1. NO TIE-INS WILL BE MADE TO THE PLANT POTABLE WATER LINES WITHOUT A COMPLETED DESIGN DRAWING INITIALED BY THE POTABLE WATER COMMITTEE MEMBERS LISTED IN PARAGRAPH 4 AND SIGNED BY THE ENGINEERING MANAGER. IN EMERGENCIES, TEMPORARY TIE-INS MAY BE MADE WITH THE ENGINEERING MANAGER'S AND, IF POSSIBLE, POTABLE WATER COORDINATOR'S APPROVAL. FOLLOW-UP SHALL BEGIN IMMEDIATELY TO COMPLETE THE DRAWINGS AND ROUTING FOR SIGNED APPROVAL BY ALL COMMITTEE MEMBERS.
- 2. AFTER THE DESIGN IS APPROVED BY ALL COMMITTEE MEMBERS, ONE PRINT SHALL BE FORWARDED TO POTABLE WATER COORDINATOR AND ONE TO PLANT PROTECTION SUPERVISOR.
- 3. NO QUICK CONNECTIONS SHALL BE INSTALLED ON PLANT POTABLE WATER LINES AND NO CONNECTIONS OF ANY TYPE SHALL BE MADE BETWEEN POTABLE WATER LINES AND PROCESS LINES.
- 4. THE POTABLE WATER COMMITTEE MEMBERS ARE D. A. SYCHOK, J. P. JACOBS, W. H. FLOYD, HORACE HILTON, AND S. B. DEYALL.

APC 005541

'F-1
01-16-79

BLUE FLAG RULE

A BLUE FLAG ATTACHED TO A RAILROAD TRACK IS A WARNING THAT IT IS A POTENTIALLY DANGEROUS AREA AND NO RAILROAD EQUIPMENT IS TO PASS BEYOND THE BLUE FLAG.

1. THE BLUE FLAG MUST BE USED FOR PROTECTION OF ALL PERSONNEL WHEN WORKING IN AND ABOUT RAILROAD TRACKS AND CARS. EXCEPTION TO THIS IS THE ALUMINA LOADING STATION AT R-51 WHERE THE LARGE DAILY SUPPLY OF RAILROAD CARS TO BE LOADED MAKES THE PRACTICE IMPRACTICAL.
2. COPS OR OTHER OBJECTS MUST NOT BE PLACED WHERE THEY WILL OBSTRUCT THE BLUE FLAG FROM THE VISION OF RAILROAD PERSONNEL.
3. THE BLUE FLAGS SHALL BE PLACED BETWEEN THE CONTROLLING SWITCH AND THE END OF THE FIRST CAR OR WORKING AREA ON TRACK TO BE FLAGGED OUT. WHENEVER POSSIBLE, THE BLUE FLAG SHOULD BE PLACED AT LEAST 150 FEET FROM THE WORKING AREA. WHEN WORKING ON A TRACK WHERE ENGINE CAN APPROACH FROM EITHER DIRECTION, A BLUE FLAG MUST BE PLACED AT EACH END OF CAR(S) OR WORKING AREA.

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4. THE BLUE FLAG MUST BE ATTACHED TO THE RAIL SO THAT THE FLAG WILL BE ON THE OUTSIDE OF THE TRACK AND ON THE SAME SIDE AS THE ENGINEER RIDES. ON ALL TRACKS EXCEPT REFINING TRACKS R-8 AND R-9, THE BLUE FLAG MUST BE PLACED ON THE NORTH RAIL OF EAST-WEST RUNNING TRACKS AND ON THE EAST RAIL OF NORTH-SOUTH RUNNING TRACKS. ON REFINING TRACKS R-3 AND R-5 AND R-14 BLUE FLAGS ARE TO BE PLACED ON BOTH RAILS.
5. A "WHITE INFORMATION TAG" SHALL BE ATTACHED TO THE BLUE FLAG BY THE SUPERVISOR IN CHARGE OF THE CRAFT OR DEPARTMENT PERFORMING WORK IN THE CONTROLLED AREA. THE BLUE FLAG IS NOT TO BE REMOVED BY ANY PERSON OTHER THAN THE ONE WHO PLACED IT OR SOMEONE DESIGNATED BY THE SUPERVISOR IN CHARGE.
6. EACH EMPLOYEE, BEFORE DOING WORK IN WHICH THEY COULD BE ENDANGERED BY THE MOVEMENT OF RAILROAD EQUIPMENT SHALL ATTACH HIS/HER OWN PERSONALLY SIGNED WHITE PERSONAL DANGER TAG TO THE BLUE FLAG. ALL WHITE PERSONAL DANGER TAGS MUST HAVE THE DEPARTMENT AND SIGNATURE OF THE PERSON ATTACHING THE TAG.
7. GROUP TAG OUT PROCEDURE MAY, AT THE DISCRETION OF A CREW OR UNIT SUPERVISOR, BE UTILIZED. THE SUPERVISOR OF A CREW OR UNIT MAY ATTACH HIS/HER WHITE AND GREEN GROUP DANGER TAG TO THE BLUE FLAG TO COVER ALL MEMBERS OF HIS CREW. THIS WILL BE DONE WITH THE ACKNOWLEDGEMENT OF EACH CREW MEMBER AND ANY MEMBER MAY ALSO ATTACH THEIR WHITE PERSONAL DANGER TAG IF THEY SO DESIRE. THE WHITE AND

APC 005543

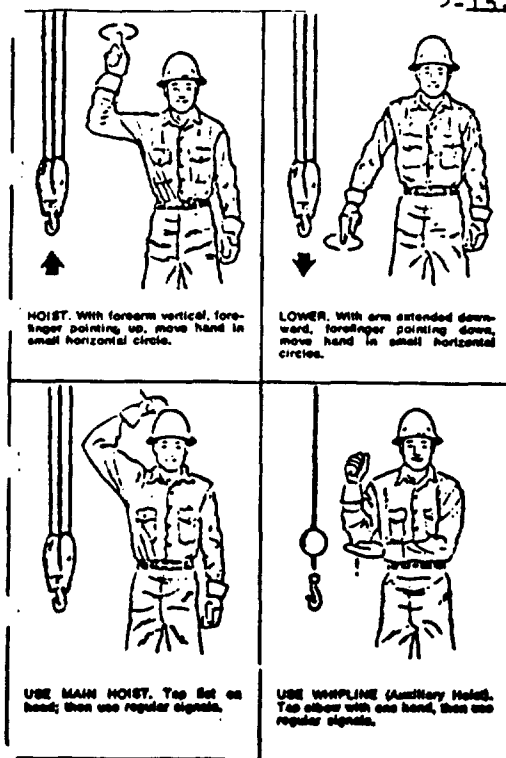
AF-3
01-16-80

GREEN GROUP DANGER TAG MAY BE REMOVED ONLY BY THE SUPERVISOR WHO ATTACHED IT OR BY A SUPERVISOR IN THE SAME CRAFT OR DEPARTMENT AS THE INDIVIDUAL TO WHOM IT BELONGS WHO HAS A THOROUGH KNOWLEDGE OF THE PERSONNEL AND EQUIPMENT INVOLVED, AND CAN THEREBY SAFELY ACCEPT THE RESPONSIBILITY FOR REMOVING THE TAG.

8. WHEN A BLUE FLAG IS USED AT NIGHT, A BLUE LIGHT MUST ALSO BE DISPLAYED.
9. IT IS PERMITTED FOR A TRACKMOBILE TO ENTER THE TRACK INSIDE OF BLUE FLAGS WHEN PLACING THE TRACKMOBILE ON THE TRACK. CAR MOVEMENT BY THE OPERATING GROUP WHETHER BY A CAR PULLER OR TRACKMOBILE IS ACCEPTABLE.

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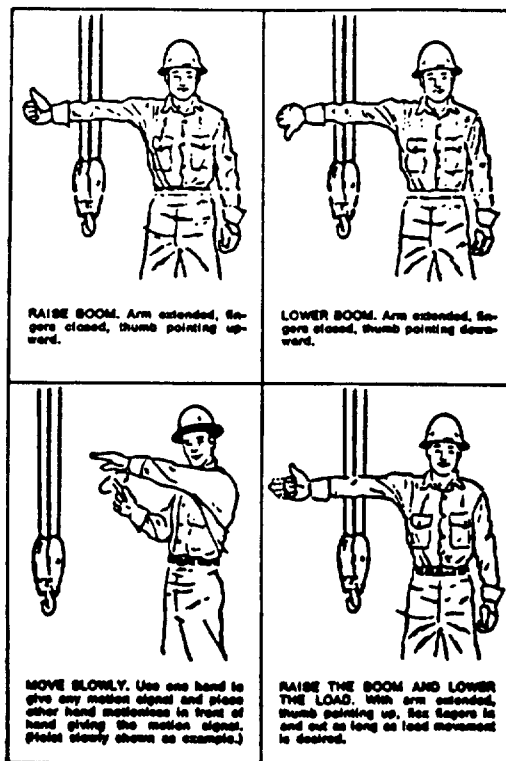
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9-15-76



**STANDARD HAND SIGNALS
FOR CONTROLLING CRANE OPERATIONS**

APC 005545

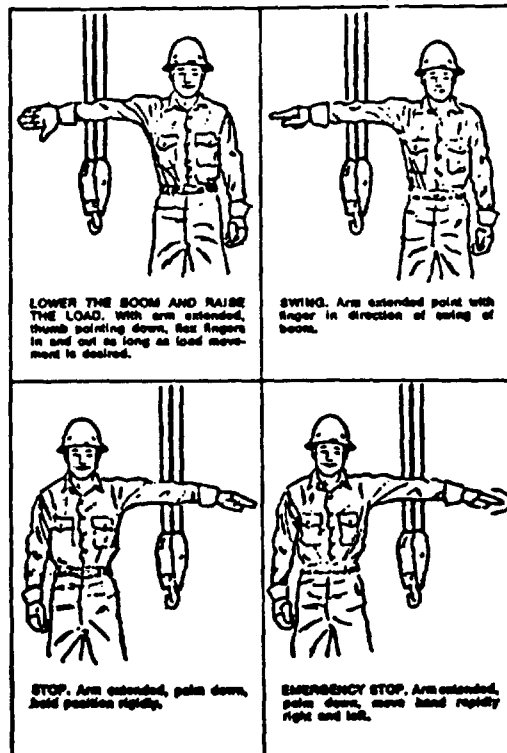
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**STANDARD HAND SIGNALS
FOR CONTROLLING CRANE OPERATIONS**

APC 005546

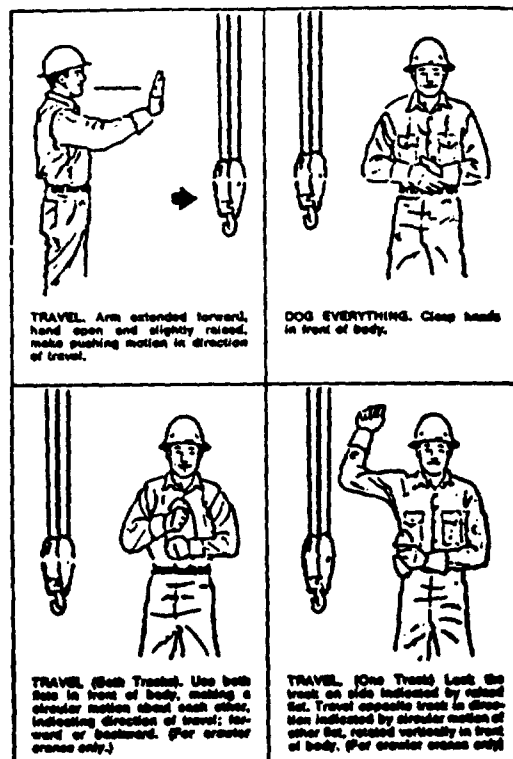
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**STANDARD HAND SIGNALS
FOR CONTROLLING CRANE OPERATIONS**

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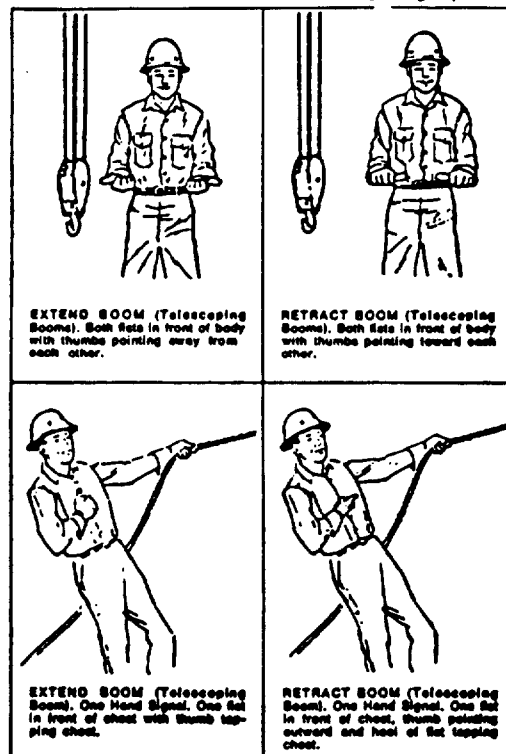
AG-4
9-15-76



**STANDARD HAND SIGNALS
FOR CONTROLLING CRANE OPERATIONS**

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**STANDARD HAND SIGNALS
FOR CONTROLLING CRANE OPERATIONS**

APC 005549

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9-15-76

FIRST AID AND HEALTH

A. MOVING INJURED PERSON

1. INSTRUCTION FOR HANDLING INJURED
PEOPLE AFTER A SERIOUS ACCIDENT

MOVE THE INJURED PERSON IF THERE IS
IMMEDIATE DANGER, BUT DON'T LET THE
VICTIM GET UP.

IF A VICTIM IS IN A POSITION WHERE
ADDITIONAL HARM MAY OCCUR BECAUSE OF
FIRE, FUMES, BROKEN LIQUOR OR ACID
LINES, ETC., THEN, OF COURSE, THE
VICTIM MUST BE MOVED AT ONCE. HOW-
EVER, THE INJURED SHOULD BE HANDLED
WITH EXTREME CARE. MANY DEATHS HAVE
RESULTED FROM ROUGH HANDLING AND IM-
PROPER TRANSPORTATION OF ACCIDENT
CASES.

IF IT IS ABSOLUTELY ESSENTIAL TO
CARRY A VICTIM TO SAFETY, THE IM-
PORTANT THING TO REMEMBER IS TO KEEP
THE INJURED BODY AS STRAIGHT AS POS-
SIBLE. IF PATIENT MUST BE MOVED IN
A FEW SECONDS BECAUSE OF BROKEN ACID
OR LIQUOR LINES, DON'T LIFT, BUT DRAG
TO SAFETY; OTHERWISE, PROCEED AS
FOLLOWS:

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2. THREE WAY-LIFT-AND-CARRY "PREPARE
TO LIFT PATIENT"

EACH OF THE THREE PEOPLE KNEEL ON THE KNEE NEAREST THE PATIENT'S FEET; ONE OPPOSITE THE PATIENT'S SHOULDERS, ANOTHER OPPOSITE THE PATIENT'S HIPS, AND THE THIRD OPPOSITE THE PATIENT'S KNEES. KNEEL ON THE UNINJURED SIDE. THEY PASS THEIR HANDS AND FOREARMS UNDER THE PATIENT AND AT COMMAND "LIFT PATIENT", SLOWLY RAISE THE PATIENT AND SUPPORT THE VICTIM ON THEIR KNEES. PATIENT'S NECK SHOULD REMAIN STRAIGHT AT ALL TIMES. AT THE COMMAND "PREPARE TO RISE WITH PATIENT", THE BEARERS SLOWLY TURN THE PATIENT ON TO THE PATIENT'S SIDE SO THAT THE PATIENT RESTS IN THE BEND OF THEIR ELBOWS AND IS HELD CLOSELY TO THEIR CHESTS. WHEN THE COMMAND "RISE WITH PATIENT" IS GIVEN, ALL RISE SLOWLY. THE BEARERS CAN NOW, WHEN COMMANDED, STEP OFF IN ANY DIRECTION.

3. PLACING PATIENT ON A STRETCHER

THREE PEOPLE TAKE THE SAME POSITIONS DESCRIBED ABOVE ON UNINJURED SIDE OF

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PATIENT. FOURTH PERSON IS ON OPPOSITE SIDE OF THE HIPS. NO. 1 PLACES HANDS UNDER PATIENT'S NECK AND SHOULDERS. NOS. 2 AND 4 PLACE HANDS UNDER PATIENT'S PELVIS AND SMALL OF BACK; NO. 3 PLACES HANDS UNDER PATIENT'S KNEES AND THIGHS. "LIFT PATIENT". THE PATIENT IS SLOWLY RAISED AND SUPPORTED ON THE KNEES OF THE THREE PEOPLE, AND THE FOURTH PERSON PLACES STRETCHER UNDER PATIENT. IF PRACTICABLE, LIFT PATIENT JUST HIGH ENOUGH FOR THE FOURTH PERSON TO SLIDE A STRETCHER UNDER THE PATIENT, AND NOT TO THE KNEES OF THE KNEELING PEOPLE.

"PREPARE TO LOWER PATIENT". THE PERSON WHO HAS PLACED THE STRETCHER KNEELS AND PLACES THE HANDS IN A POSITION TO SUPPORT PATIENT.

"LOWER PATIENT". THE PATIENT IS GENTLY LOWERED TO STRETCHER.

B. SPECIFIC INJURIES

1. FRACTURE OF THE SPINE

THE PROCEDURE FOR THE FIRST AID CARE AND TRANSPORTATION OF FRACTURES OF THE SPINE HAS THE APPROVAL OF THE COMMITTEE ON FRACTURES OF THE

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AMERICAN COLLEGE OF SURGEONS.

CAUSES -- AUTOMOBILE ACCIDENTS, FALLING FROM HEIGHTS, AND DIVING INTO SHALLOW WATER FORM THE CHIEF SOURCES OF FRACTURES OF THE SPINE AND INJURIES TO THE SPINAL CORD. CRUSHING INJURIES, SUCH AS THOSE CAUSED BY THE FALL FROM A HEIGHT, ARE ALSO COMMON.

THESE INJURIES RESULT IN FRACTURE AND DISLOCATION OF ONE OR MORE VERTEBRAE WHICH MAY RANGE FROM VERY SLIGHT CHIPS OF BONE TO CRUSHING AND DISPLACEMENT OF THE VERTEBRAE AND DAMAGE TO THE SPINAL CORD. SUCH INJURIES ARE USUALLY HANDLED FIRST BY PEOPLE WITH NO FIRST AID TRAINING. PERMANENT PARALYSIS MAY RESULT BY WRONG HANDLING WHICH, BY PROPER CARE, MIGHT BE PREVENTED.

SYMPTOMS-- IF THE VICTIM IS CONSCIOUS, IT MAY BE POSSIBLE TO TELL YOU WHERE THERE IS PAIN AND WHAT HAPPENED. PAIN IN THE NECK OR BACK MAY BE THE ONLY SYMPTOM. NEVER LIFT AN INJURED PERSON WITHOUT FIRST ASKING THE VICTIM TO MOVE THE FEET OR HANDS. IF THE VICTIM CANNOT OPEN

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AND CLOSE THE FINGERS RAPIDLY, OR GRASP YOUR HANDS FIRMLY, THE VICTIM'S NECK IS PROBABLY BROKEN; IF THE VICTIM CAN MOVE THE FINGERS BUT NOT THE FEET OR TOES, THE VICTIM'S BACK IS PROBABLY BROKEN. IN EITHER CASE, THE SPINAL CORD MAY BE INJURED BUT NOT BE SEVERED. DO NOT LIFT THE VICTIM'S HEAD EVEN ENOUGH TO GIVE A DRINK OF WATER. DO NOT LET THEM TRY TO RISE OR SIT UP, OR THE INJURY TO THE SPINAL CORD MAY BECOME COMPLETE, AND PERMANENT PARALYSIS MAY RESULT. IF THE VICTIM IS UNCONSCIOUS AND A SPINAL INJURY IS SUSPECTED, HANDLE THE VICTIM AS IF THE NECK WERE BROKEN. SHOCK IS USUALLY SEVERE.

THE FOLLOWING PROCEDURES ARE TO PREVENT FURTHER DAMAGE TO THE SPINAL CORD:

1. FIRST AID CARE -- FRACTURED NECK -- IF THE VICTIM WITH A BROKEN NECK MUST BE MOVED, GET A DOOR, A SHUTTER, OR A WIDE BOARD AND PLACE IT BESIDE THE VICTIM WITH THE END AT LEAST FIFTEEN INCHES WIDE, AND FIVE FEET OR MORE IN LENGTH.

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IF THE VICTIM IS ON HIS/HER BACK, ONE PERSON SHOULD KNEEL ABOVE THE VICTIM'S HEAD AND, HOLDING THE HEAD BETWEEN TWO HANDS, STEADY IT SO THAT THE HEAD, NECK, AND SHOULDERS MOVE AS A UNIT WITH THE BODY WITHOUT BENDING. ONE OR MORE OTHER PERSONS MAY THEN GRASP THE VICTIM'S CLOTHING AT THE SHOULDERS AND HIPS, AND CAREFULLY SLIDE THE VICTIM SIDWAYS ONTO THE BOARD OR DOOR SO THAT THE VICTIM STAYS FACE UPWARD, ARMS AT SIDES; HEAD, TRUNK, AND EXTREMITIES ON THE BOARD. THE HEAD MUST NOT BE RAISED OR THE NECK BENT FORWARD OR SIDWAYS. THE ARMS MAY THEN BE FOLDED OVER THE CHEST AND HELD TOGETHER BY SAFETY PINS OR A BANDAGE. SEVERAL STRAPS AND BANDAGES SHOULD BE PLACED AROUND THE VICTIM AND THE BOARD TO HOLD THE VICTIM IN PLACE DURING TRANSPORTATION. NO PILLOW SHOULD BE PLACED UNDER THE HEAD, BUT SWEATERS, CLOTHING OR IMPROVISED SMALL BAGS

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SHOULD BE PLACED AGAINST THE SIDES OF THE HEAD TO KEEP IT FROM ROLLING TO THE SIDE DURING TRANSPORTATION. THE CHIN SHOULD BE UP. THE BOARD WITH THE VICTIM ON IT MAY THEN BE LIFTED ONTO A BLANKET OR A STRETCHER, AND CARRIED BY TWO OR MORE BEARERS.

IF THE VICTIM WITH A BROKEN NECK IS FOUND LYING FACE DOWNWARD, A DOOR OR BOARD SHOULD BE PLACED BESIDE THE VICTIM AS DESCRIBED ABOVE, THE ARM ON THAT SIDE EXTENDED ABOVE THE HEAD. THE PERSON KNEELING AT THE HEAD MUST FIRMLY GRASP THE VICTIM'S HEAD AT THE SIDES, THE HANDS COVERING THE EAR AND THE ANGLE OF THE JAW. THEN AS THE VICTIM IS ROLLED ONTO THE BOARD, THE VICTIM'S HEAD MUST BE STEADIED AND KEPT IN LINE WITH THE BODY AS THE VICTIM IS TURNED TO THE FACE UP POSITION. MODERATE TRACTION MAY BE EXERTED, WITH THE HANDS HOLDING THE HEAD, AS THE VICTIM IS ROLLED ONTO THE BOARD BY ONE OR MORE ASSISTANTS

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KNEELING AT THE SIDE OF THE BOARD. THE HEAD AND TRUNK MUST BE TURNED IN UNISON. UNDER NO CIRCUMSTANCES MUST THE HEAD BE TILTED FORWARD OR BACKWARD.

2. BROKEN BACK -- WHEN THE BACK IS BROKEN, GET A DOOR, SHUTTER, OR SIMILAR WIDE BOARD, AND PLACE IT BESIDE THE INJURED PERSON SO THAT IT EXTENDS SEVERAL INCHES BEYOND THE LEVEL OF THE TOP OF THE VICTIM'S HEAD. IF THE VICTIM IS LYING ON THE VICTIM'S BACK, RAISE THE ARM ON THE SIDE TOWARD THE BOARD SO THAT IT EXTENDS STRAIGHT ABOVE THE VICTIM'S HEAD. SEVERAL ASSISTANTS THEN KNEEL ALONGSIDE THE BOARD OPPOSITE THE VICTIM AND, REACHING ACROSS THE VICTIM, GRASPING THE CLOTHING ON THE FAR SIDE, THEY ROLL THE VICTIM SLOWLY AND GENTLY TOWARD THEMSELVES SO THAT THE VICTIM LIES FACE DOWNWARD ON THE BOARD. IF A DOOR IS USED, THE ASSISTANTS MAY KNEEL ON THE DOOR, LEAVING SPACE TO ROLL THE VICTIM TOWARD THEM. IN MAKING THIS ROLL, THE BODY MUST BE MOVED AS A UNIT,

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WITHOUT TWISTING OR JERKING, AND WITH NO BENDING OF THE BACK. ONE FOREARM MAY THEN BE BELTED TO LIE BENEATH THE VICTIM'S HEAD. TWO OR THREE PERSONS CAN TURN OVER THE INJURED BETTER THAN ONE ALONE, AND, IF OTHER PERSONS ARE AVAILABLE, ONE SHOULD KNEEL AT THE HEAD AND STEADY THE VICTIM'S HEAD AS THE VICTIM IS ROLLED OVER, WHILE ANOTHER STEADIES THE FEET.

ALTHOUGH THERE MAY BE NO SYMPTOMS, IF A BROKEN BACK OR A BROKEN NECK IS SUSPECTED, HANDLE IT AS THOUGH THE VICTIM HAD A FRACTURE OF THESE PARTS. IF UNCONSCIOUS, THE VICTIM SHOULD BE HANDLED AS THOUGH THE NECK WERE BROKEN. IF BOTH NECK AND BACK ARE BROKEN, HANDLE AS A BROKEN NECK.

THE GREATEST CARE MUST BE USED IN TRANSPORTING THESE CASES TO AVOID ANY JOLT OR SUDDEN STOP. AN AMBULANCE SHOULD BE OBTAINED, IF POSSIBLE, AND THE DRIVER MUST BE CAUTIONED TO GO VERY SLOWLY AND CAREFULLY.

IF NO BOARD IS AVAILABLE, THE EIGHT WAY LIFT CAN BE USED IN-

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STEAD. THE EIGHT WAY LIFT IS THE SAFEST METHOD TO USE IN LIFTING A PATIENT FOR LOADING ON A STRETCHER IN CASES WHEN THERE IS A BROKEN NECK, BROKEN BACK, OR FRACTURED PELVIS. THIS METHOD IS PARTICULARLY VALUABLE WHEN THERE ARE PLENTY OF PEOPLE TO DO THE LIFTING, BUT WHEN NONE OF THEM HAVE MUCH STRENGTH; FOR EXAMPLE, A GROUP OF YOUNG BOYS OR GIRLS.

FOUR BEARERS ON EACH SIDE ARE PREFERRED, ALTHOUGH THREE ON EACH SIDE MAY BE USED. EACH KNEELS ON THE KNEE NEAREST THE PATIENT'S FEET. HANDS, WRISTS, AND FOREARMS ARE WORKED GENTLY UNDER THE PATIENT'S BACK UNTIL THE PALMS OF THE HANDS ARE ABOUT IN THE MID-LINE. THE HANDS SHOULD BE ALTERNATED FROM THE TWO SIDES. THE TWO HANDS UNDER THE PATIENT'S HEAD MAY HAVE THE FINGERS INTERLOCKED TO FORM A CUP UNDER THE HEAD.

NO LIFTING SHOULD BE DONE UNTIL EVERYONE IS READY. AT THE COMMAND

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"LIFT", THE PATIENT IS CAREFULLY LIFTED ON THE HANDS AND FOREARMS. BE CAREFUL TO KEEP THE PATIENT IN A PERFECTLY STRAIGHT LINE. THE STRETCHER MAY NOW BE PLACED UNDER THE VICTIM, AND THE VICTIM CAREFULLY LOWERED, KEEPING THE BODY IN A PERFECTLY STRAIGHT LINE.

3. FRACTURED EXTREMITIES -- IN THE EVENT OF A FRACTURED EXTREMITY THE PATIENT IS NOT TO BE MOVED WITHOUT PROPER SPLINTING OF THE INVOLVED ARM OR LEG. IF THE PATIENT IS ENDANGERED BY LEAVING THE PATIENT AT THE SCENE, CAREFULLY MOVE THE VICTIM FROM THE SCENE OF DANGER BEFORE SPLINTING. IF THERE IS NO SERIOUS BLEEDING, A PATIENT SUFFERING A FRACTURE DOES NOT HAVE TO BE MOVED AT ONCE. THE VICTIM SHOULD BE PROPERLY PREPARED FOR MOVING FIRST.

2. SERIOUS BLEEDING

THERE ARE THREE WAYS TO STOP SERIOUS BLEEDING:

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9-15-76

A. APPLICATION OF DIRECT PRESSURE
ON THE WOUND.

B. COMPRESSION OF AN ARTERY AT A
"PRESSURE POINT" ABOVE THE
WOUND OR COMPRESSION OF A VEIN
JUST BELOW THE WOUND.

C. APPLY A TOURNIQUET.

A. REMEMBER -- IN ALL SERIOUS
BLEEDING, THINK FIRST OF PRESSURE.
USE A CLEAN HANDKERCHIEF, A PIECE
OF CLOTH, OR SOME OF YOUR OWN CLOTH-
ING IF NECESSARY. HOLD THE MATERIAL
IN PLACE DIRECTLY ON THE WOUND AND
EXERT FIRM PRESSURE WITH YOUR HAND.
IN ALMOST ALL CASES, THE BLEEDING
WILL IMMEDIATELY SLOW DOWN AND
STOP WITHIN A FEW MINUTES.

B. SOMETIMES DIRECT PRESSURE
ALONE WILL NOT STOP SERIOUS BLEEDING.
IF THIS HAPPENS, A LARGER ARTERY OR
VEIN HAS BEEN CUT AND YOU MUST APPLY
BOTH DIRECT PRESSURE ON THE WOUND
AND PRESSURE ON THE ARTERY SIMULT-
ANEOUSLY. EACH PRESSURE POINT IS
LOCATED WHERE A MAIN ARTERY LIES DIRECT-
LY AGAINST A BONE. USE THE PRESSURE

APC 005561

AH-13
9-15-76

POINT BETWEEN THE WOUND AND THE HEART. APPLYING PRESSURE ON THE WOUND AND THE PRESSURE POINT SIMULTANEOUSLY WILL CONTROL BOTH ARTERIAL AND VENOUS BLEEDING; THEREFORE NO ADDITIONAL INFORMATION ABOUT VENOUS BLEEDING IS NECESSARY.

C. VERY RARELY IS THE USE OF A TOURNIQUET NECESSARY AND IT SHOULD BE USED ONLY AS A LAST RESORT. IF AN ARM OR LEG HAS BEEN CRUSHED OR SEVERED, THE APPLICATION OF A TOURNIQUET MAY BE A LIFE-SAVING PROCEDURE. THERE ARE TWO CONVENIENT PLACES FOR APPLYING A TOURNIQUET CORRECTLY TO CONTROL BLEEDING:
(1) AROUND THE UPPER ARM, ABOUT A HAND'S WIDTH BELOW THE ARMPIT, AND
(2) AROUND THE THIGH, ABOUT THE SAME DISTANCE BELOW THE GROIN.

A TOURNIQUET SHOULD BE A FLAT BAND AT LEAST TWO INCHES WIDE. IT SHOULD NEVER BE A ROPE OR WIRE. A PIECE OF CLOTH, A BELT, STOCKING, LARGE HANDKERCHIEF, OR SOMETHING SIMILAR WILL DO. WRAP THE MATERIAL TWICE AROUND THE LIMB, IF POSSIBLE, AND TIE A HALF KNOT. PLACE A SHORT STICK OR SIMILAR ARTICLE ON THE HALF

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9-15-76

KNOT AND TIE A SQUARE KNOT OVER IT. TWIST THE STICK TO TIGHTEN THE TOURNIQUET, THUS PRESSING ON THE ARTERY AND STOPPING THE FLOW OF BLOOD. HOLD THE STICK IN POSITION BY THE ENDS OF THE BANDAGE ALREADY APPLIED, OR BY ANOTHER BANDAGE LOOPED AROUND THE END OF THE STICK AND TIED AROUND THE LIMB.

REMEMBER -- A TOURNIQUET IS ALWAYS A DANGEROUS INSTRUMENT AND SHOULD NOT BE USED IF THE BLEEDING CAN BE CHECKED READILY OTHERWISE. IF THE TOURNIQUET IS TOO TIGHT, THERE IS DANGER OF PERMANENTLY DAMAGING THE ARTERIES. ON THE OTHER HAND, IF THE TOURNIQUET IS NOT TIGHT ENOUGH, IT WILL ACTUALLY INCREASE THE BLEEDING.

3. IF BREATHING HAS STOPPED

WHEN A PERSON STOPS BREATHING, THEY BECOME UNCONSCIOUS, AND DEATH WILL OCCUR IN ABOUT FOUR MINUTES. AFTER BREATHING CEASES, THE HEART CONTINUES TO BEAT FOR A FEW MINUTES. IT IS IN THIS CRUCIAL TIME THAT A PERSON'S LIFE MAY BE SAVED. THE MOST COMMON EMERGENCIES CAUSING BREATHING TO STOP ARE DROWNING, INHALING POISON GASES, SWALLOWING

APC 005563

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POISON, STRANGLING, CHOKING,
ELECTRIC SHOCK, SMOTHERING,
AND HEART FAILURE.

YOU CAN DETERMINE WHETHER OR
NOT A PERSON IS BREATHING BY
PLACING YOUR HAND ON THE UPPER
SECTION OF THE ABDOMEN WHERE
THE BRESTBONE AND RIBS END.
IF NO BREATHING MOTIONS CAN BE
SEEN OR FELT, START ARTIFICIAL
RESPIRATION AT ONCE.

MOUTH-TO-MOUTH METHOD OF ARTIFICIAL RESPIRATION

DIRECTIONS:

IF THERE IS FOREIGN MATTER
VISIBLE IN THE MOUTH, WIPE IT OUT
QUICKLY WITH YOUR FINGERS OR A
CLOTH WRAPPED AROUND YOUR FINGERS.

TILT THE HEAD BACK SO THE CHIN
IS POINTING UPWARD (Fig. 1).



Fig. 1

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PULL OR PUSH THE JAW INTO A JUTTING-
OUT POSITION (FIG. 2 AND FIG. 3).
THESE MANEUVERS SHOULD RELIEVE OBS-
TRUCTION OF THE AIRWAY BY MOVING THE
BASE OF THE TONGUE AWAY FROM THE BACK
OF THE THROAT.



Fig. 2



Fig. 3

OPEN YOUR MOUTH WIDELY AND PLACE IT
TIGHTLY OVER THE VICTIM'S MOUTH.

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AT THE SAME TIME PINCH THE VICTIM'S NOSTRILS SHUT (FIG. 4). AN ALTERNATE METHOD IS TO CLOSE THE VICTIM'S MOUTH AND PLACE YOUR MOUTH OVER THE VICTIM'S NOSE. BLOW INTO THE VICTIM'S MOUTH OR NOSE. (AIR MAY BE BLOWN THROUGH THE VICTIM'S TEETH, EVEN THOUGH THEY MAY BE CLENCHED.) THE FIRST BLOWING EFFORTS SHOULD DETERMINE WHETHER OR NOT OBSTRUCTION EXISTS.



Fig. 4

REMOVE YOUR MOUTH, TURN YOUR HEAD TO THE SIDE, AND LISTEN FOR THE RETURN RUSH OF AIR THAT INDICATES AIR EXCHANGE. REPEAT THE BLOWING EFFORT.

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FOR AN ADULT, BLOW VIGOROUSLY AT THE RATE OF ABOUT 12 BREATHS PER MINUTE. FOR A CHILD, TAKE RELATIVELY SHALLOW BREATHS APPROPRIATE FOR THE CHILD'S SIZE, AT THE RATE OF ABOUT 20 PER MINUTE. TIME YOUR EFFORTS TO COINCIDE WITH VICTIM'S FIRST ATTEMPT TO BREATHE FOR HIMSELF.

IF YOU ARE NOT GETTING AIR EXCHANGE, RECHECK THE HEAD AND JAW POSITION (FIG. 2 AND FIG. 3). IF YOU STILL DO NOT GET AIR EXCHANGE, QUICKLY TURN THE VICTIM ON HIS SIDE AND ADMINISTER SEVERAL SHARP BLOWS BETWEEN THE SHOULDER BLADES IN THE HOPE OF DISLODGING FOREIGN MATTER (FIG. 5). AGAIN SWEEP YOUR FINGERS THROUGH THE VICTIM'S MOUTH TO REMOVE FOREIGN MATTER.



Fig. 5

APC 005567

AK-19
9-15-76

THOSE WHO DO NOT WISH TO COME IN CONTACT WITH THE PERSON MAY HOLD A CLOTH OVER THE VICTIM'S MOUTH OR NOSE AND BREATHE THROUGH IT. THE CLOTH DOES NOT GREATLY AFFECT THE EXCHANGE OF AIR.

IF VOMITING OCCURS, QUICKLY TURN THE VICTIM TO THE SIDE, WIPE OUT THE MOUTH, AND THEN REPOSITION THE VICTIM.

THE VICTIM SHOULD BE KEPT AS QUIET AS POSSIBLE UNTIL REGULAR BREATHING IS ESTABLISHED. KEEP THE VICTIM COVERED AND OTHERWISE TREATED FOR SHOCK UNTIL SUITABLE TRANSPORTATION IS AVAILABLE.

ARTIFICIAL RESPIRATION SHOULD BE CONTINUED UNTIL THE VICTIM BEGINS TO BREATHE SPONTANEOUSLY, OR UNTIL A PHYSICIAN PRONOUNCES THE VICTIM DEAD, OR UNTIL THE PERSON APPEARS TO BE DEAD BEYOND ANY DOUBT.

DOCTOR'S CARE IS NECESSARY DURING THE RECOVERY PERIOD, AS RESPIRATORY AND OTHER DISTURBANCES MAY DEVELOP AS AN AFTERMATH.

(TAKEN FROM AMERICAN RED CROSS -- ARC 10868).

APC 005568

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9-15-76

ADDITIONAL RELATED DIRECTIONS

IT IS ALL IMPORTANT THAT ARTIFICIAL RESPIRATION, WHEN NEEDED, BE STARTED QUICKLY. THE HEAD OF THE SUBJECT SHOULD BE EXTENDED, NOT FLEXED FORWARD, AND THE CHIN SHOULD NOT SAG LEST OBSTRUCTION OF THE RESPIRATORY PASSAGE OCCUR. A CHECK SHOULD BE MADE TO ASCERTAIN THAT THE TONGUE OR FOREIGN OBJECTS ARE NOT OBSTRUCTING THE PASSAGE. AN AIRWAY SHOULD BE USED IF AVAILABLE. THESE ASPECTS CAN BE CARED FOR WHEN PLACING THE SUBJECT INTO POSITION OR SHORTLY THEREAFTER, BETWEEN CYCLES. A SMOOTH RHYTHM IN PERFORMING ARTIFICIAL RESPIRATION IS DESIRABLE, BUT SPLIT-SECOND TIMING IS NOT ESSENTIAL. SHOCK SHOULD RECEIVE ADEQUATE ATTENTION, AND THE SUBJECT SHOULD REMAIN RECUMBENT AFTER RESUSCITATION UNTIL SEEN BY A PHYSICIAN OR UNTIL RECOVERY SEEMS ASSURED.

4. SHOCK

HANDLE SHOCK AS FOLLOWS:

SHOCK IS A PROFOUND IMPRESSION MADE ON THE NERVOUS SYSTEM. IT OCCURS IN MORE OR LESS DEGREE FOLLOWING ALL ACCIDENTS, AND IN CASE OF FRIGHT, ANGER, OR SURGICAL OPERATIONS. SHOCK IS DANGEROUS AND SHOULD BE GIVEN PROMPT ATTENTION.

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9-15-76

ALLOWING AN INJURED PERSON TO SEE THE INJURY OFTEN CAUSES SHOCK, ESPECIALLY IF THERE IS MUCH BLEEDING. WHEN A PERSON IS SUFFERING FROM SHOCK, THE FACE IS PALE AND HAS AN ANXIOUS EXPRESSION, THE EYELIDS DROOP, THE EYES ARE DULL AND THE PUPILS LARGE, THE SKIN IS CLAMMY AND COVERED WITH COLD SWEAT. A SHOCK VICTIM IS SOMEWHAT STUPOROUS AND TAKES LITTLE INTEREST IN THINGS ABOUT THEM. THEY MAY SUFFER FROM NAUSEA AND VOMITING. THEY MAY ANSWER QUESTIONS SLOWLY. THEY MAY BE PARTLY OR TOTALLY UNCONSCIOUS, OR THEIR MIND MAY WANDER. USUALLY THEY ARE PERFECTLY QUIET AND WILL NOT MOVE UNLESS DISTURBED. BREATHING IS SHALLOW AND FEEBLE; THE PULSE IS RAPID AND WEAK, AND MAY NOT BE FELT AT THE WRIST. WHEN THIS CONDITION IS OBSERVED, BRING THEM TO THE DISPENSARY ON A STRETCHER BUT FIRST REMOVE FROM THE MOUTH ALL FOREIGN BODIES, SUCH AS FALSE TEETH, TOBACCO, OR GUM. WRAP THE PERSON IN WARM BLANKETS OR CLOTHING. THE HEAD SHOULD BE LOWER THAN THE LEGS AT ALL TIMES DURING SHOCK.

APC 005570

AH-22
9-15-76

5. TREATMENT FOR CHEMICAL BURNS

IT IS ESSENTIAL IN ANY SITUATION WHERE CHEMICALS COME IN CONTACT WITH THE PERSON TO IMMEDIATELY FLUSH THE AFFECTED AREAS WITH A COPIOUS AMOUNT OF WATER. IT IS FOR THIS REASON THAT THERE ARE NUMEROUS EMERGENCY SHOWERS AND EYE WASH FOUNTAINS LOCATED ABOUT THE PLANT. A GREEN LIGHT IS KEPT BURNING AT ALL TIMES TO MARK THESE LOCATIONS. AN ORDINARY DRINKING FOUNTAIN MAY ALSO SERVE IN AN EMERGENCY AS AN EYE WASH FOUNTAIN. ALWAYS FLUSH THE AFFECTED AREAS THOROUGHLY BEFORE REPORTING TO FIRST AID FOR TREATMENT BECAUSE TIME IS A VERY IMPORTANT ELEMENT IN SITUATIONS OF THIS TYPE. UNLESS THE CHEMICALS ARE HEATED, THERE IS NORMALLY NOT MUCH CHANCE OF SUSTAINING SERIOUS BURNS IF WATER IS USED IMMEDIATELY, UNLESS IT GETS INTO THE EYES. THOROUGH WASHING IN EYE CASES IS ALSO A MUST BEFORE REPORTING TO THE MEDICAL DEPARTMENT FOR TREATMENT.

GENERAL GOOD HEALTH AND SAFETY PRACTICES

WORK ONLY WHEN YOU'RE PHYSICALLY FIT
TELL YOUR SUPERVISOR IF ANYTHING IS
WRONG WITH YOU.
REPORT ALL INJURIES PROMPTLY. SHALL

APC 005571

*salt
tablets
outlawed*

AN-23
9-15-76

CUTS OR SCRATCHES MAY BECOME INFECTED.
GET FIRST AID AT ONCE.

SALT TABLETS ARE AVAILABLE AT DISPENSERS LOCATED THROUGHOUT THE PLANT. THEIR PURPOSE IS TO PREVENT HEAT CRAMPS BY REPLACING SALT LOST THROUGH EXCESSIVE PERSPIRATION. USE THEM FREELY, ESPECIALLY IN HOT WEATHER, AND WHEN WORKING ON HOT JOBS. IF HEAT AND PERSPIRATION ARE EXCESSIVE, UP TO TEN (10) TABLETS DAILY MAY BE TAKEN. DRINK PLENTY OF WATER. IF SALT TABLETS IRRITATE YOUR STOMACH, DRINK 2 - 3 GLASSES OF GATORADE AS NEEDED.

~~WEAR~~ ~~OUTSIDE~~ GLOVES AND GAUNTLETS
WHEN HANDLING MATERIAL THAT MAY CAUSE
INJURY TO BARE HANDS.

TREATMENT OF INJURIES

THE COMPANY MAINTAINS A DISPENSARY FOR THE TREATMENT OF INJURIES. (THE MEDICAL DEPARTMENT IS LOCATED ON FIRST FLOOR OF BUILDING 1.)

1. EVERY PERSON WHO, IN THE COURSE OF EMPLOYMENT, RECEIVES AN INJURY, NO MATTER HOW SLIGHT, SHOULD REPORT TO THE MEDICAL DEPARTMENT, AS PROMPTLY AS POSSIBLE FOR PROPER TREATMENT.

APC 005572

AH-24
9-15-76

PAINFUL INFECTIONS OFTEN RESULT IF THIS IS NOT DONE.

2. NO EMPLOYEE, OTHER THAN A MEMBER OF THE MEDICAL STAFF, SHALL GIVE ANY MEDICAL ATTENTION, EXCEPT IMMEDIATE FIRST AID, TO ANY OTHER EMPLOYEE. IMMEDIATE FIRST AID DOES NOT INCLUDE THE REMOVAL OF FOREIGN BODIES FROM THE EYE. FOR IMMEDIATE FIRST AID, FOLLOW INSTRUCTIONS FOR HANDLING INJURED PEOPLE AFTER A SERIOUS ACCIDENT.
3. AFTER TREATMENT BY THE MEDICAL DEPARTMENT, THEIR INSTRUCTIONS ARE TO BE FOLLOWED UNTIL YOU ARE RELEASED FROM FURTHER TREATMENT. FREQUENTLY, ONE TREATMENT OF A SMALL INJURY IS ALL THAT IS NECESSARY. HOWEVER, IF YOUR INJURY FAILS TO HEAL PROMPTLY, YOU ARE EXPECTED TO RETURN FOR TREATMENT EVEN THOUGH YOU HAVE NOT BEEN SPECIFICALLY TOLD TO DO SO.

APC 005573

AI-1
5-17-78

CONTRACTOR'S EXCEPTIONS TO POINT COMFORT'S
SAFETY RULES

1. CONTRACTOR AND CONTRACT PERSONNEL ARE RECOMMENDED TO, BUT NOT REQUIRED, TO WEAR SAFETY TOE SHOES. THEY ARE REQUIRED, AS A MINIMUM STANDARD, TO WEAR SUBSTANTIAL LEATHER SHOES OR RUBBER BOOTS. REFER TO PAGE 1, RULE A, 1.
2. CONTRACTOR AND CONTRACT PERSONNEL MAY RIDE SEATED ON THE BEDS OF TRUCKS WITH THEIR ARMS, LEGS, AND ALL PARTS OF THEIR BODIES INSIDE THE VEHICLE BODY. RIDING IN A STANDING POSITION IS PROHIBITED EXCEPT WHEN IN VEHICLES WITH SPECIAL PROVISIONS, SUCH AS GRAB RAILS, FOR STANDING. REFER TO PAGE 3, RULE B, 5.
3. CONTRACTOR SHALL FOLLOW THE MORE RIGID OF OSHA OR MESA REQUIREMENTS FOR THE INSPECTION OF THEIR TOOLS AND EQUIPMENT. THEY ARE NOT REQUIRED TO USE ALCOA'S INSPECTION PROCEDURES. REFER TO PAGE 5, RULE C, 3.
4. CONTRACTORS WILL BE ACCOUNTABLE FOR COMPLYING WITH ONLY THE TOOL AND SAFETY EQUIPMENT PROCEDURES ATTACHED TO THE SITE CONDITIONS IN THE CONTRACT SPECIFICATIONS. REFER TO PAGE 6, C-10.

APC 005574

A1-2
S-17-78

THE FOLLOWING LISTS THE TOOL AND SAFETY EQUIPMENT PROCEDURES REQUIRED OF THE CONTRACTOR:

- A. SAFETY BELTS (S-1)
- B. FACE SHIELD, RAINSUIT, RUBBER BOOTS, AND CHEMICAL GLOVES (S-3).
- C. BARRICADES AND WARNING SIGNS (S-7).
- D. SAFETY SHOWERS AND EYE WASH STATIONS (S-5).
- E. PORTABLE OXYGEN ACETYLENE RIG (S-5).
- F. PORTABLE LADDERS (G-1).

APC 005575

FROM J. E. HINES
INGOT CASTING DIVISION
ALCOA TECHNICAL CENTER - B

TO DIVISION/DEPARTMENT MANAGERS
ALCOA LABORATORIES
ATC & NEW KENSINGTON

1979-03-08

RE: ASBESTOS-FREE BOARD PRODUCTS

The Ingot Casting Division has completed laboratory evaluations of two commercially available board products which have handling, machining, and thermal characteristics similar to asbestos-containing Marinite, Molten Metal Marinite, and Marimet. They are Marinite I, formerly called Marinite XLO manufactured by Johns-Manville, and Pyrotherm B-1, distributed in the United States by Pyrotek Inc. The attached literature briefly describes both boards.

Although these materials can be supplied in either heat-treated or unheat-treated form, the heat treatment is a necessity when used in contact with molten metal. When heat treated, both products have excellent molten metal resistance and thermal stability. In the Ingot Casting Division, these products and R-680 have replaced asbestos Marinite in all applications except sheet ingot headers of which testing is continuing.

Marinite I has been established as a storeroom item at ATC. It is supplied as 1.22 X 2.44-m (4 X 8-ft) sheets in either 25.4 mm (1 in.) or 50.8 mm (2 in.) thicknesses, but can be cut by the Marinite Shop to a requested size. Stores' stock number for these thicknesses are 094-200-0035 and 094-200-0070, respectively. When obtaining the board through Stores, one should also specify if application requires heat treatment. Ingot Casting Division presently heat treats only a portion of the as-received boards to 290°C (550°F) for molten metal contact usage.

Only with the cooperation and effort of the various divisions/departments can the Laboratories and Alcoa completely replace asbestos. The Ingot Casting Division continues to work closely with Pittsburgh Mechanical Engineering Division--Furnace Group, Pittsburgh Purchasing, and the AL Safety Department to accomplish this goal.

Safety Statement - Marinite I and Pyrotherm B-1 do not contain asbestos but are composed of glassy fibers and calcium silicate which can cause skin irritation. Therefore, it is recommended that adequate protective clothing, safety goggles, and dust collection equipment be used during any machining operation.

If there are any questions regarding application or properties of these products, please contact Dick LaBar (X2328) or myself (X2815).

J. E. Hines
J. E. HINES

APC 005576

 ALCOA

GP-4503

TYPICAL PHYSICAL AND THERMAL PROPERTIES

1. THERMAL PROPERTIES	
Specific heat @ 25°C	
Maximum service temperature for continuous service °C	
for intermittent service °C	
Thermal movement co-efficient of thermal expansion to 125°C per °C	
Thermal shrinkage (linear) 4 hours at 500°C 312°F 4 hours at 625°C 4 hours at 750°C	
Thermal shrinkage (thickness) 4 hours at 500°C 4 hours at 625°C 4 hours at 750°C	
Thermal conductivity kcal/m ² h°C at mean temp:	
25°C	
100°C	
200°C	
300°C	
400°C	
500°C	
Thermal transmittance kcal/m ² h°C for thicknesses:	
12.7mm	
19.1mm	
25.4mm	
2 x 19.1mm	
2 x 25.4mm	
3 x 25.4mm	

Pyrotherm Board C-2	Pyrotherm Bd Heat Treated
0.23	0.28
500	500
750	750
2.6x 10 ⁻⁶	6.0x 10 ⁻⁶
0.70%	0.30%
0.80%	0.40%
1.10%	0.60%
1.40%	0.30%
1.60%	0.30%
1.70%	0.70%
0.121	0.163
0.193	0.172
0.193	0.176
0.198	0.181
0.202	0.185
0.205	0.189
5.56	5.23
4.57	4.34
3.94	3.72
3.03	2.89
2.54	2.35
1.87	1.79

2. PHYSICAL PROPERTIES
Nominal dry density, kg/m ³
Nominal moisture content, % dry weight
Moisture movement, % shrinkage: normal to dry expansion: normal to 90% RH expansion: normal to saturation
Modulus of rupture, dry, kg/cm ²
Modulus of elasticity, kg/cm ² x 10 ⁶
Impact strength: 15mm board (BS1211: Pt.2.1969)
Reinell hardness, dry 50kg load, 10mm ball, 10 sec.
Screw-holding: ultimate pull-out load kgf 12.7mm penetration 19.1mm penetration 22.2mm penetration
Compression under load 17.53 kgf/cm ²

Pyrotherm Board C-2	Pyrotherm Bd Heat Treated	C-2
720	720	
5 approx.	7 approx.	
0.0020	0.0012	
0.0001	0.0001	
0.0002	0.0002	
70	35	
0.030	0.050	
150mm		
2.7	4.0	
67.5	67.5	
125	100	
	APC 005577	

MARINITE I formerly
(MARINITE XLO)- PHYSICAL PROPERTIES

<u>Density</u> - pcf	46	
<u>Modulus of Rupture</u> - psi	725	
<u>Screw Holding Strength</u> - lb.		
1/2" Penetration	87	
7/8" Penetration	208	
<u>Pandux Hardness</u> - Units	63	
<u>Shrinkage</u> - %		
(5 hr. at Temperature)	<u>1000°F</u>	<u>1200°F</u>
Length	0.32	0.35
Width	0.43	0.50
Thickness	1.26	1.51
<u>Ignition Loss</u> - % -	12.7	
1 hr @ 1800°F		
<u>Panel Cracking Test</u> -	Passed	

Effect of Temperature on Properties
(24 hr. at Temperature)

	<u>Temperature - °F</u>				
	<u>400</u>	<u>600</u>	<u>800</u>	<u>1000</u>	<u>1200</u>
Wt. Loss %	5.4	8.0	9.0	9.9	10.8
Modulus of Rupture Retained - %	80	67	65	64	57

Compressive Strength

<u>Applied Pressure psi</u>	<u>Deflection Under Load inches/inch</u>	<u>Consolidation Permanent inches/inch.</u>
500	0.032	-----
1000	0.058	0.025
2000	0.179	0.132
3000	0.299	0.235
4000	0.366	0.320
5000	0.418	0.369
6000	0.462	0.400
7000	0.483	0.433

APC 005578

Marinite I
(Marinite XLO)- Physical Properties
March 2, 1978
Page 2

Tensile Strength - psi

Parallel to face of sheet - 200

Brinell Hardness 1.2

45.4 kg load, 19.05 mm ball, 15 sec

Thermal Conductivity

(Btu - in/sq.ft./°F/hr.)

Mean Temperature °F	k
75	0.88
350	0.82
400	0.81
600	0.79
800	0.81
1000	0.86

<u>Pricing:</u>	<u>Thickness</u>	<u>Sheets 4 X 8 ft (1219 X 2438 mm)</u>
	1 in. (25.4 mm)	\$79.36 each
	2 in. (50.8 mm)	\$226.56 each

APC 005579

PYROTHERM BOARD B-1

A COMPLETELY NEW BOARD FIRST MARKETING IN 1977.
NOT AVAILABLE FROM ANY SOURCE EXCEPT PYROTEK INC.

Check these unusual properties

1. Absolutely asbestos free.
2. Tough, shock resistant.
3. Easily machined to any shape with woodworking equipment.
4. Usable to 1400° F (760° C) with minimum shrinkage.
5. Not wetted by molten aluminum.

Specifications

Color: White
Shrinkage: 3% at 1100° F
Density: 46 lbs/cu. ft. (737 kg/cu. m.)
Tensile Strength:
 Original 1000 psi
 After heating to 1300° F 460 psi

Heat treatment to remove moisture

Heat to 230° F (110° C) for four hours.

Caution: Moisture will be re-absorbed if maintained in humid areas at room temperatures.

PRICING F.O.B. CARLISLE, PENNSYLVANIA

Thickness	Sheets 4' x 8' (1219 x 2438 mm)	
1/2" (1.3 mm)	\$ 79.60 each	Prices apply to any quantity. Add an \$10.00 crating charge to orders of less than \$300.00.
3/4" (1.9 mm)	125.00 each	
1" (2.5 mm)	153.85 each - 4.31/sq ft	
1 1/2" (3.8 mm)	269.23 each	
2" (5.1 mm)	442.30 each	

We are fully equipped to saw or machine this material to any shape required.



Devotedly Serving Metal Casters Since 1935

Pyrotek

INCORPORATED

5801 Montgomery Avenue, Spokane, Washington 99205

Phone Area Code 509 926-6211 Telex 225404

Box 77, P.O. 1 Claremont Road, Carlisle, Pennsylvania 17013

Phone Area Code 717 249 2075

APC 005580

FROM JAMES E. HINES
INGOT CASTING DIVISION
ALCOA TECHNIAL CENTER - B

TO MR. RUDY E. PODHORA
POINT COMFORT WORKS

1979-12-07

RE: ASBESTOS-FREE BOARD SUBSTITUTES

Per our telephone conversation, I have attached the letter issued on Molten Metal Marinite usage by M. J. Caprio and me. As you can see, there still is a substantial quantity of this material being purchased, even though it is a health hazard and it is Johns-Manville's corporate objective to stop production of Marinite products containing asbestos by the end of 1980. The two products which have been found to be acceptable substitutes for regular grade asbestos Marinite are Marinite I (Johns-Manville) and Pyrotherm B-2 (Pyrotek, Inc.) Attached is literature which describes both boards. Please note their limitations. They can be used as adequate substitutes in all applications which Molten Metal Marinite is used, except for feed-boards and headers, provided they have been properly heat treated.

If there are any questions regarding application areas, please contact me.


JAMES E. HINES

JEH:pm

Attachments (original only)

cc: ID - ATC, D
H. G. Sakoian - Pittsburgh 7
M. J. Caprio - Pittsburgh 19
R. E. Miller/R. G. LaBar/File 10.322

cc: Dave Christensen } 12-13-79
L.F. Wagner



Chris Gonzales 12-19-79
W. F. A. Sharkey/R.M. Rose 12-19-79
ALCOA

APC 005581

17-1103

FROM R. E. Podhora
Industrial Hygiene Department

TO Mr. R. M. Rose
cc Mr. F. A. Sharkey
Mr. Joe Hutchins
Mr. J. D. Fisher
Mr. W. "H." Floyd
Mr. Sam B. Devall
Mr. L. F. Wagner
Mr. Haig G. Sakoian-PGH

1979 August 6

RE: ASBESTOS SUBSTITUTION - Potroom Crucible-Lid Gasket

Ref.: Attached 1979-07-30 report from Mr. Haig G. Sakoian, Pittsburgh
Industrial Hygiene Department

As per our earlier conversation, this morning 79-08-06, I discussed with Mr. Jerry Haaland, Warrick's, progress on asbestos substitution. Mr. Phil Scheble, Ingot Metallurgist is to supply information for me on their molten metal flow control cones. Mr. Haaland reported that use of low cost rubber hose was initiated in 1967 as a crucible-lid gasket material. Aluminum foil is also used to fill in gaps to make a good seal. The rubber hose held up for almost 6 to 7 cycles of lid removal and reinstallation, however, they are now only getting about 2 to 3 cycles for numerous reasons. One main problem is the inexperienced labor caused by a high turn-over of personnel.

Coincidentally, I received the attached report from Mr. Haig Sakoian, Pittsburgh. His report also shows the use of rubber hose as described above.

According to Mr. Sakoian's letter, Mr. J. M. ("Mickey") McCollum, Mech. Engineer, Pittsburgh, has been coordinating the Potroom asbestos replacement for other plants, however, according to Mr. Joe Hutchins, we have not as yet heard from Mr. McCollum. This is understandable because the Potrooms were shut down when the local survey was submitted to Pittsburgh for evaluation. A number of Refining asbestos materials have been replaced with non-asbestos substitutes; however we are still using asbestos in some Smelting applications. I recommend the attached tables be used for obtaining suitable substitutes for specific applications where possible in the Smelting operations.

During my telephone conversation with Mr. Sakoian today, he reported that Mr. Mario Caprio will be coordinating the Purchasing Department's activities for asbestos substitution. Also, a list of persons who are/or will be coordinating the asbestos substitution will be prepared shortly.

In order to maintain an organized and a systematic approach to the asbestos substitution, I recommend that Mr. Joe Hutchins be designated as the Smelting asbestos substitution coordinator and a mechanical engineer be similarly selected for

continued on page 2



10-4500

APC 005582

each of the Alumina and Chemicals divisions. It is also recommended that the Point Comfort Industrial Hygiene Department be kept informed and up to date on the progress being made so the information can be relayed to our Pittsburgh group for evaluation, further coordination, and distribution to other plants.

Rudy E. Podhora
Rudy E. Podhora
Industrial Hygiene Department

Attachment
REP:sc

APC 005583

FROM R. E. PODHORA
INDUSTRIAL HYGIENE DEPT.
POINT COMFORT OPERATIONS

→ TO MR. TOM B. BONNEY
INDUSTRIAL HYGIENE DEPT.
PITTSBURGH OFFICE

cc: Mr. R. M. Rose
All Superintendents
All Department Heads
All Managers

1978 October 16

RE: ELIMINATION OF UNNECESSARY USE OF ASBESTOS CONTAINING MATERIALS

In accordance with your request of 78 July 28, a survey of our asbestos containing materials uses has been made. A summary of responses from the user departments is attached. A department code identification is also included.

Items 27, 35, 52 and 57 are identified as dust sources. Item 27, sheet asbestos paper is in process of being replaced with a non-asbestos substitute; however, we are experiencing problems obtaining a suitable substitute for the Casting Dept. plug bar sealer material. Items 52 and 57, a wick and tape can be moisten to control potential dust. Item 35, Marinite is still a problem to substitute. According to our latest information, no satisfactory material has been found that will endure the heat shock as well as Marinite.

Although new asbestos gaskets, packing, seals and etc., installed on pipe, tank and pump flanges and etc., are not an asbestos dust problem initially, but become a real potential problem later when maintenance requires removal of the gasket or etc. Often the most expeditious removal is to grind off the gasket residuals.

Therefore, special precautions are required to provide prescribed protective equipment and asbestos control handling procedures to avoid unnecessary contamination.

We hopefully look forward to a list of substitute materials that will be suitable.

Should you need further information, please call.

Rudy E. Podhora
R. E. PODHORA

REP:cch

Attachments



ALCOA

Letter completed 10-4-78 & typed & mailed 10-16-78

07-4000

APC 005584

FROM ERNEST P. COX
STAFF BUYER
POINT COMFORT OPERATIONS

TO MR. GARY GEHLHOFF
POINT COMFORT OPERATIONS

cc: → Mr. Rudy Podhora - Point Comfort

Mr. Alan Law
Triplex Inc.
Box 15276
Houston, Texas 77020

1978 May 22

RE: ASBESTOS PAPER - STOCK NUMBERS 210-235-0002 AND 210-235-0004

Mr. Rudy Podhora asked whether the captioned material contains asbestos.

John Manville, the current supplier, advises that this is in fact a highly refined asbestos sheet.

Triplex, our J-M distributor, is sending us literature and samples on Fiberfrax, a non-asbestos substitute. I'll forward samples to you on receipt for evaluation.

ERNEST P. COX

EPC/gac

10-11-78

Samples went out to ingot plant today
(u) 1 50/pq

[Signature]

 ALCOA

GP-4000 (REV 11-66)

APC 005585

FROM R. E. PODHORA
INDUSTRIAL HYGIENIST
POINT COMFORT OPERATIONS

TO MR. R. M. ROSE
MANAGER - SAFETY,
ENVIRONMENTAL & HEALTH
POINT COMFORT OPERATIONS

1978 December 18

RE: ELIMINATION OF UNNECESSARY USE OF ASBESTOS-CONTAINING MATERIALS
ASBESTOS CONTROL PROGRAM - POINT COMFORT OPERATIONS

Reference Mr. Tom B. Bonney's letter, 1978 July 28
Mr. R. E. Podhora's response letter, 1978 October 16

In an attempt to eliminate as many asbestos containing materials as possible to minimize employee exposure, the Pittsburgh Industrial Hygiene Department is currently reviewing the plant surveys recently submitted and investigating substitutes. Based on our local experience, I anticipate this monumental task will take several months, at best, to accomplish. Because of the special applications at our chemicals division and, therefore, the uniqueness of Point Comfort Operations and the need to promptly convert to non-asbestos materials wherever practical, I request the temporary, part time assistance from three engineers (one chemical, one mechanical, and one electrical) who are familiar especially with the Electrolyte and Chlor-Alkali plants to assist me in the conversion to non-asbestos materials within the current state of technology. The following are reasons for my request:

1. We must be cautious not to set up substitute materials which are satisfactory for some applications, but could cause a hazardous condition in another area. For example, Fiberfrax is suitable for some Ingot Casting applications, however, it is not resistant to hydrogen fluoride.
2. Considerable work has already been done, however, in order to eliminate a "hit and miss" prolonged project, I believe it would be best for us to apply the necessary manpower to do a thorough job, provide the technical leadership, complete the evaluations in a few months and submit the necessary SF 225 forms for Purchasing and Stores to set up the new stock and eliminate as much asbestos material as possible.
3. Since our engineers are far more familiar with the Point Comfort Chemicals Division's materials applications, we will likely be asked to provide information for the Pittsburgh group anyway.
4. Personal involvement in this project has made me realize that to attempt to do it alone would be overwhelming and poor management.

R. E. Podhora
R. E. PODHORA

REP:gm

APC 005586



67-4003

FROM ROBERT P. CARTER
HEALTH & ENVIRONMENT DEPARTMENT
PITTSBURGH OFFICE, 7AB

TO

&

M. J. CAPRIO
PURCHASING DEPARTMENT
PITTSBURGH, 19AB

R. E. Podhora
Point Comfort Operations

30Mar76

RE: ALTERNATES FOR ASBESTOS AND ASBESTOS-CONTAINING MATERIALS

In October, 1975, the Occupational Safety and Health Administration (OSHA) published a proposed revision to its standard for worker exposure to asbestos which will drastically reduce the permissible time-weighted average (TWA) permissible fiber count and also reduce the permissible ceiling or short term exposure for 15-minute periods. In the Industrial Hygiene Newsletter dated 19Nov75, which went to all works Industrial Hygienists, the possible impact of the proposed changes was reviewed on a paragraph-by-paragraph basis.

As stated near the end of that Newsletter, this proposed revision, which may not become final until late 1976, makes it highly desirable for us to replace the use of asbestos and asbestos-containing materials with non-asbestos material in every situation where the use of asbestos can result in worker exposure to airborne fiber. This, of course, has to be based upon functional suitability of the non-asbestos containing replacement material. This replacement, however, should not be based on strict cost equivalence since the costs of medical surveillance, air sampling and analysis, and training as required by the proposed standard are very considerable.

In order to facilitate this conversion, Mr. A. E. Kean of the Pittsburgh Purchasing Department has agreed that Mr. M. J. Caprio of his group will serve as a clearing house, or contact person, for plant locations seeking alternate non-asbestos materials with satisfactory functional performance. In order for this to be as effective as possible, Mr. Caprio will need to know what physical and chemical properties are required for the application, defined as fully as practicable. As necessary, he will consult with Dr. R. G. LaBar of Alcoa Technical Center for assistance.

According to Mr. J. A. Dunbar of the Ingot, Pigment, Powder and Paste Division, satisfactory non-asbestos alternates have been established for all significant melting and casting applications, except for some applications of Molten Metal Marinite (MMM). Extensive plant evaluation of the alternate material developed for MMM is actively underway. If significant problems are encountered with any of these established alternates, Mr. Dunbar or Dr. LaBar should be made aware of these promptly.



APC 005587

FROM PITTSBURGH PURCHASING
INDUSTRIAL - 19

TO MEMORANDUM

Joe Zerkow received
29

October 4, 1972

RE: NATIONAL PURCHASE AGREEMENT P-615951
JOHNS-MANVILLE SUPEREX INSULATION BLOCK

Johns-Manville has completed their development of an asbestos-free high temperature insulation block. This is welcomed news in light of our concern on OSHA standards involving the handling of asbestos type materials.

Beginning with October shipments, Johns-Manville will be filling all orders for Superex with either the present Superex material containing approximately 8% asbestos or the Asbestos-Free Superex. Until Johns-Manville's entire production capacity has been converted to the asbestos-free material, many orders may be mixed with both types of insulation block. During this conversion period, the Asbestos-Free Superex cartons will be stenciled with the suffix AF (Superex 2000 AF). When the transition is complete, the AF suffix will be dropped and all Johns-Manville Superex will be asbestos-free. Total conversion is expected on or before March 1, 1973.

The new Asbestos-Free Superex has a maximum use temperature of 2000°F and is superior to the present Superex with respect to both compressive strength and thermal conductivity. The transverse strength (modulus of rupture) of the new board is slightly less than that of the asbestos board, but this difference should have little effect on our applications. A copy of the properties of the new board is attached.

For the balance of our agreement period for Superex, the price of the new board will be the same as that for the present formulation of Superex. However, because of the higher cost ingredients in the new board, a price increase for Superex may be imminent when the present agreement expires on December 31, 1972.

For all future releases of Superex, do not specify "asbestos-free". The new material will be fed into your orders on the basis of the supply on hand at the time of your release.



APC 005588

J-M SUPEREX - ASBESTOS FREE
(Preliminary Properties 9/11/72)

	<u>Suprex 2000 AF</u>
Density, lbs. per cubic foot	24
Modulus of rupture, psi	65
Compressive strength, psi at 5% deformation (2" thick)	150
Linear Shrinkage, % @ 2000°F	2.8
Maximum Service Temperature, °F (in oxidizing atmosphere)	2000
Thermal Conductivity, BTU/In./Sq. Ft./°F/Hr. at mean temperature, °F	
400	0.59
600	0.65
800	0.70
1000	0.77

APC 005589

J. MICHAEL MCCOLLUM
MECHANICAL ENGINEERING DIVISION
PITTSBURGH OFFICE 3WPH

MEMORANDUM

1980-06-12

RE: ASBESTOS SUBSTITUTES - POTROOMS

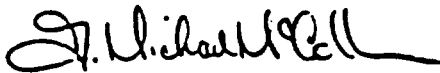
After successful testing at Badin and Massena, we are able to recommend a non-asbestos product for use as a crucible lid gasket on the vacuum type potroom tapping crucibles. This product is Z-5 treated fiberglass from Pyrotek Inc.,* and replaces the Johns-Manville 872 or 702 gasketing material presently used in the tapping crucibles. The treatment applied to the Z-5 enables it to withstand a higher temperature than untreated fiberglass.

Z-5 is actually a fabric material which Pyrotek will fabricate with the cross-section required. Several layers of the Z-5 are stitched together giving a final thickness of 1/2 inch. The proper number of these 1/2" thick tapes are then used to replace the asbestos material. At Badin, for instance, three 1/2" thick tapes, each 1-1/2" wide, are used to replace the 1-1/2" square asbestos gasket. The total cost for one complete seal of Z-5 material is less than one seal of the asbestos material you are presently using.

This material will replace the asbestos gasket only. If aluminum foil is twisted into a rope and used between the cruce lid and gasket, your plant will in all probability have to continue this practice.

One problem we have found with this material is that the top layer wants to pull out of the lip on the cruce whenever the lid is removed. The material remains unharmed, and can be reused, but to prevent this from happening, you may want to order the Z-5 in widths 1/4" to 1/2" wider than the asbestos material.

Although I do not believe we have specifically tried Z-5 as a gasket between the siphon and the cruce lid, it ought to work for that application as well.


J. MICHAEL MCCOLLUM

JMM:scv

Distribution on Page Two

* Pyrotek, Inc.
East 9601 Montgomery Avenue
Spokane, Washington 99206
Attention: J. A. (Joe) Roberts

OR

Pyrotek, Inc.
Box 77, R.D. 1, Claremont Road
Carlisle, PA 17013

APC 005590