

II. SAFETY

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1. VINYL II PLANT SAFETY POLICY

The primary objective and responsibility of each person in the Vinyl II Plant must be to perform his job in such a way that accidents and injuries DO NOT occur and that potentially serious incidents are minimized. To accomplish this objective successfully, hazards, unsafe conditions, and unsafe acts must be promptly eliminated from every phase of our operation.

Only YOU, the individual, can fulfill this responsibility. The most heavily-weighted portion of the evaluation of your performance will be the area of SAFETY. Doing things the safe way "pays off."

2. SAFETY CONCEPTS FOR THE VINYL II PLANT

- A. A SAFE work group -- with no unsafe incidents -- is possible only when everyone accepts and acts on their SAFETY responsibility. To help everyone execute their SAFETY responsibility, each individual working in the Vinyl II Plant will actively adhere to, promote, and use the following:
1. Louisiana Division and Vinyl II Plant Safety Rules and Procedures will be known by and apply to everyone.
 2. Think SAFETY. Plan the job to be SAFE and then go ahead. Planning is essential to this process.

"THINK THEN ACT
AND
THINK WHILE YOU ACT"

3. The only job well done is a job done SAFELY.
 4. Responsibility means accountability. Everyone in the Vinyl II Plant (including contract people) is accountable for SAFETY. Job safety performance is to be of prime importance in each employee's performance evaluation.
 5. As a member of a working team, everyone has the responsibility to guide, advise, and correct other team members on SAFETY matters.
 6. Accident severity increases under certain conditions (unusual non-routine work, plant shutdowns, work involving high energy sources, climbing, going into equipment, moving large, heavy equipment, etc.). Additional thought, planning, attention, and guidance is needed when such work is to be done:
- B. The number of incidents, injuries, reports to First Aid, spills, etc., which are often set up as safety goals really measure SAFETY performance, i.e., the result, not the goal. The only acceptable goal is a job well done, which is work done safely. An accident, an injury, etc., is an indicator that the system, the organization, is not functioning properly. Thus, an accident, an injury, an unsafe act, or a near miss will receive close investigation to establish four aspects:
1. The error(s) that caused the accident.
 2. The lack of controls (supervisory-management) that allowed the error(s) to occur.
 3. The degree of accountability of involved persons and supervision.
 4. Needed modifications, changes in the system and equipment to prevent recurrence.

C. It is supervision's job to prevent accidents. Vinyl II management and line supervision will not abandon or appear to abandon their SAFETY responsibility. For example, they will follow-up with needed controls to establish that rules and procedures are followed, and pre-job SAFETY planning takes place. They will encourage, motivate, and give out motivational awards for SAFETY performance. They will actively encourage good SAFETY meetings and attend these meetings with interest and enthusiasm. They will give and accept disciplinary action relative to SAFETY responsibility. They will conduct inspections to reveal hazards and unsafe conditions. They will study job procedures and observe to reveal the need for change and training. They will set a good example. The major SAFETY functions and responsibilities of various people have been set based on the above SAFETY concepts.

D. Plant Superintendent's Responsibility

1. Ultimately responsible for SAFETY of individuals and equipment in the Vinyl II Plant.
2. Maintain SAFE working conditions and use of SAFE practices.
3. Establish and maintain controls, observations, and follow-up to establish that technical and line supervision are effectively executing their SAFETY responsibilities and take needed steps to correct deficiencies.
4. Effectively communicate technical and SAFETY information received from other sources.
5. Work effectively with others so that SAFETY and SAFETY training is actively promoted.
6. Assures the execution of and the participation of all employees in a comprehensive safety program.

E. Technical and Line Supervision Responsibilities

1. Maintain SAFE working conditions and SAFE practices in areas under his jurisdiction and has direct responsibility for the SAFETY of personnel under his supervision.
2. Properly trains employees that report to him. Explains and demonstrates hazards and preventive measures and proper use of SAFETY equipment. Train and establish that the rules and procedures are known by all persons. Give special training and attention during high severity situations.
3. Schedules work group SAFETY meetings as needed so as to attain SAFE practices and work methods.
4. Promotes and enforces all SAFETY rules and procedures. Follows up to establish they are followed.

E. Safety Relief Valves with Rupture Discs

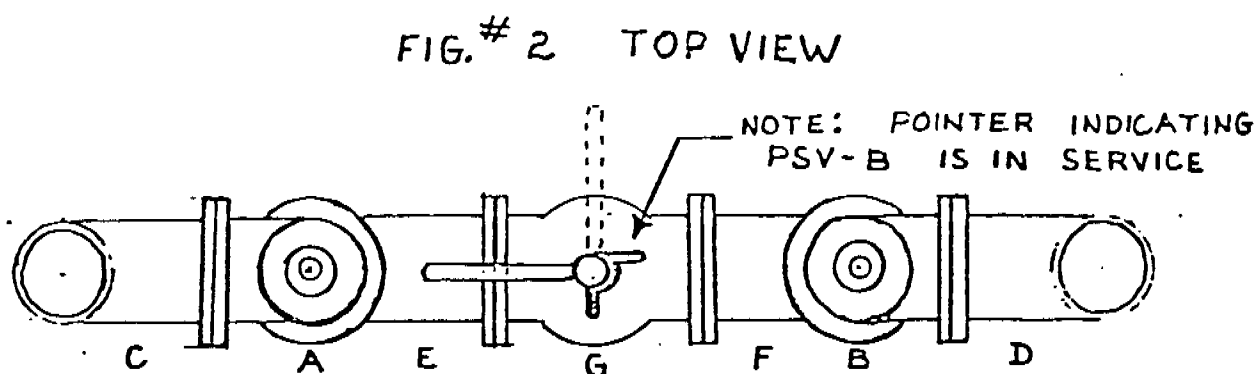
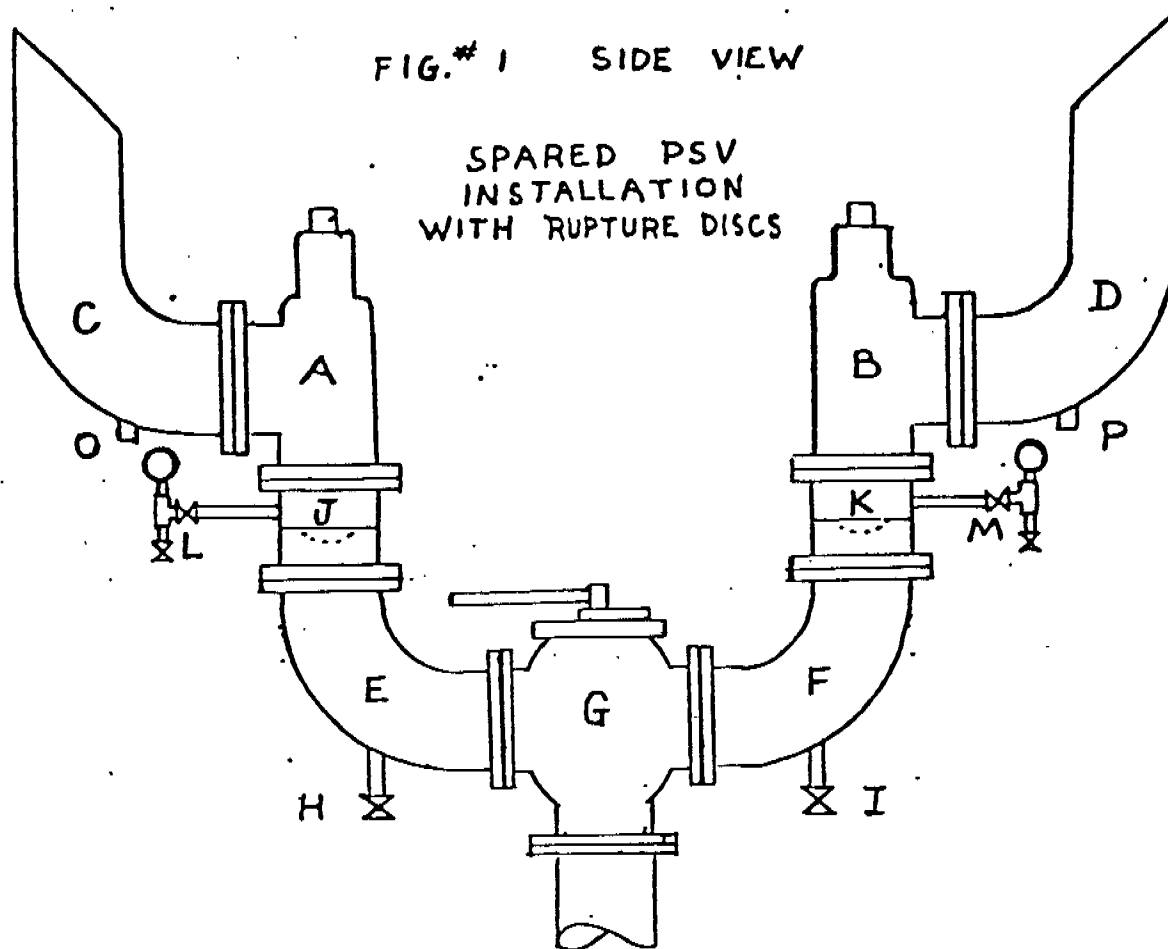
Safety relief valves or PSV's (pressure safety valves) are at times installed with rupture discs. The rupture disc is installed on the process side before the PSV. The purpose of the rupture disc is to prevent corrosive products from coming in contact with the PSV and corroding the parts so the PSV does not operate. A rupture disc is designed to break at a pressure slightly less than the pressure that operates the relief valve.

Thus, during an overpressure, the rupture disc breaks; and the pressure then is in direct contact with and opens the relief valve. When the overpressure is relieved, the relief valve again reseats and seals the equipment. The corrosive materials are, of course, now in contact with the relief valve. The rupture disc and relief valve should be replaced as soon as possible. The old PSV should be sent to the shop to be checked, cleaned, and reset. The sooner this is done, the better so as to prevent excessive damage resulting from the corrosive gases released when the rupture disc blew.

A typical arrangement of spare PSV's installed with rupture discs is shown in Figures 1 and 2 on the next page.

Routine checks of all rupture discs that are in service under PSV's must be made to establish that the disc has not broken. This is done by checking the pressure gauge attached to the rupture disc holder. (See Figure 1, next page, Parts L and M). This includes PSV.

1. Problems and Course of Action When Checking a Rupture Disc Tied In With PSV
 - a. If the pressure gauges, parts L and M are in good working order and read 0 psig, there is no problem. However, any pressure noted on these gauges indicates a problem, and further action is required.
 - b. Wearing monogoggles and with respirator being used, slowly open the bleed down valve under the rupture disc pressure gauge to atmosphere. If there is a pressure release, the disc has ruptured and must be replaced (See Step 3). If no gas release is observed and the pressure gauge still shows pressure, replace the bad gauge.
 - c. Switch the three-way valve to the spare PSV and rupture disc.
 - d. Bleed down the now off-line PSV. Again wear monogoggles and have your respirator in use. The entire assembly should depressure through the damaged rupture disc and out the long radius connecting ell bleed valve (Figure 1, parts H and I). However, it is a good practice to open the bleed valve on the rupture disc holder, also.



- | | |
|-----|---|
| A+B | PSV'S |
| C+D | VENT STACKS |
| E+F | LONG RADIUS CONNECTING ELLS |
| G | 3 WAY VALVE |
| H+I | BLEED DOWN VALVES |
| J+K | RUPTURE DISCS |
| L+M | RUPTURE DISC PRESSURE INDICATORS (GAUGES) |
| O+P | STACK DRAIN HOLES |

- e. Fill in an MMR giving a good description of the problem, location, and PSV number under which the damaged rupture disc is installed.
- f. Correctly Red Tag the three-way valve using the guidelines listed below:
 - i. Be certain that the intended PSV is located from the process by the three-way valve by observing the pointer or indicator on the valve and making sure the PSV has bled down completely. Monogoggles are required for this step.

NOTE: On a single PSV installation, the entire pressure vessel must be blocked in and depressured.

- ii. Make sure the Red Tag Master is filled in properly, according to departmental procedure and that the companion Red Tags are securely attached to the proper valve(s). The PSV is now ready to be removed.
- g. A safe work permit must be obtained from the control room by the foreman or the men doing the job.
- h. The Red Tag Master must be signed under "Clearance Accepted" by the foreman or the men doing the job.
- i. Using accepted safe work procedures, the men doing the job must:
 - i. Check the tag on the PSV against the instructions on the MMR to be sure the correct PSV is removed.
 - ii. Check the bleed valve between the PSV and the three-way valve or the bleed valve on the vessel if it is a single PSV installation. The bleed valve must be opened, indicating that the equipment is depressured.
- j. Proceed to unbolt and remove the PSV and vent stack. Monogoggles must be worn during this step.
- k. Replace the damaged rupture disc with one rated with same bursting pressure as the PSV is set to release at. Install a blind flange on the flange from which the PSV was removed to secure the equipment until the PSV is returned from the shop.
- l. Secure the PSV vent stack to handrail or other suitable structure so it will not fall or become lost.
- m. The PSV then must be removed to the warehouse or other suitable location and decontaminated with steam.

- n. After decontamination, remove the PSV information and decontamination tags from the MMR. Fill in the time and date on the decontamination tags, sign it, and attach both tags to the PSV. It may now be taken to the PSV shop for maintenance work.

NOTE: All PSV's with inlet flange sizes of four inches or larger will be lifted with a cherry picker or a hoist because of the weight involved possibly causing injury.

- o. The Red Tag Master then must be signed by the foreman or the men who performed the job under "Clearance Released."
- p. It is then the responsibility of the operations personnel to check for tightness of bolts and proper assembly of the unit. The Red Tag(s) can then be removed according to departmental procedure.

F. Safe Operation of Atmospheric Storage Tanks

There are two types of storage tanks at Vinyl II

1. Pressure Tanks

T120 and T160 are examples of pressure tanks. T120 relieves at 120 psig, and T160 relieves at 25 psig.

These tanks operate at pressure greater than atmospheric. Safety valves provide protection against overpressuring. The safety valves on these tanks are set to blow at 120 and 25 psig, respectively. Without the safety valves, it would be possible (but unlikely) for the tank to be overpressured and rupture, thus, spilling vinyl. With a safety relief valve set to blow at 120 or 25 psig and if this pressure is reached in the respective tank, the safety valve would open and release vinyl and release the excess pressure.

The safety relief valve must operate correctly and at the pressure it is set for. If the tank were to overpressure and rupture, vinyl would then be released to the air. This extreme hazard warrants the care and inspection we give these safety valves to insure they function properly. Rough handling or incorrect installation of this valve could result in malfunction, and this cannot be tolerated.

2. Atmospheric Tanks

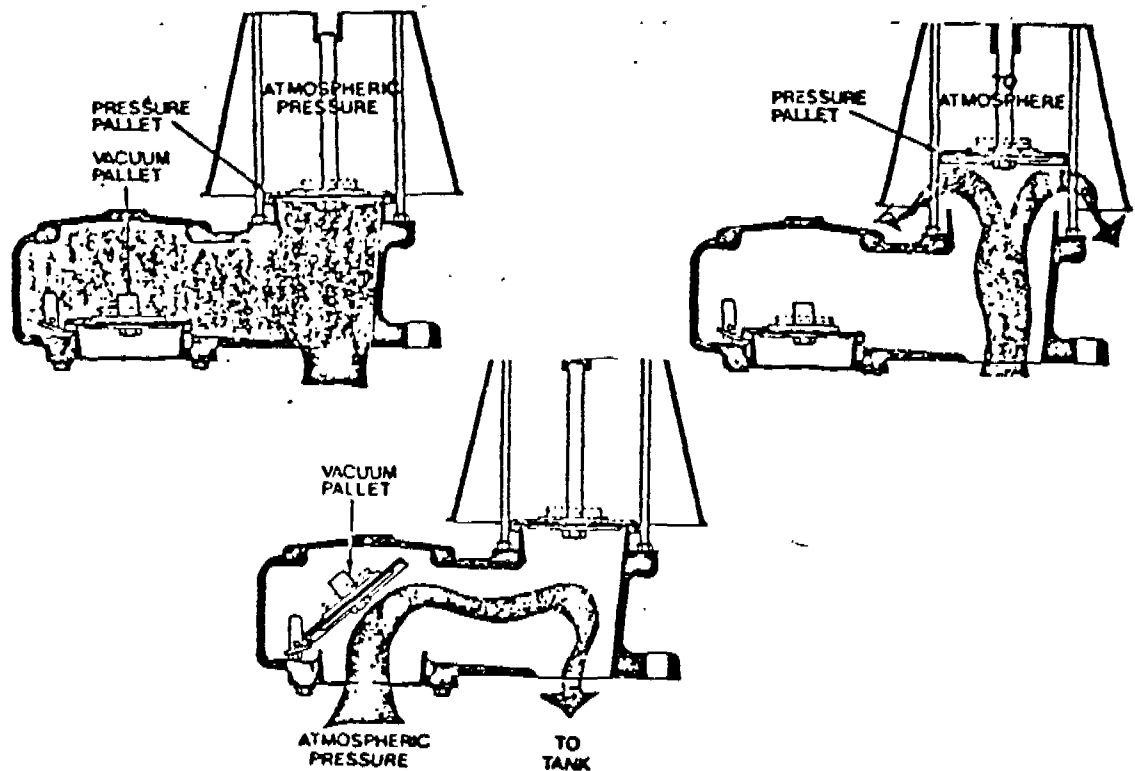
T260, T261, and T262 are examples of atmospheric tanks. Such tanks are designed to operate at atmospheric pressure. Actually, atmospheric tanks are rated to operate at a maximum pressure of 0.25 psig (or 8 inches of water). If the pressure becomes greater than this, the tank is overpressured and could fail. Thus, atmospheric tanks must be allowed to "breathe" -- inhale and exhale

for safe operation. When the tank is being filled, vapors must escape or the tank could be overpressured and rupture. Conversely, when liquid is being removed from an atmospheric tank, a vacuum could be created in the tank, and the tank could collapse. Atmospheric tanks can withstand only a small vacuum -- usually four to eight inches of water pressure.

Atmospheric tanks thus must be protected against an overpressure and a vacuum. There are several ways to do this:

a. Pressure Vacuum Relief Valve (PVRV)

Basically, a PVRV consists of two weights -- when the tank reaches a given pressure, the pressure pallet raises up and allows vapor to escape, and excess pressure is released.



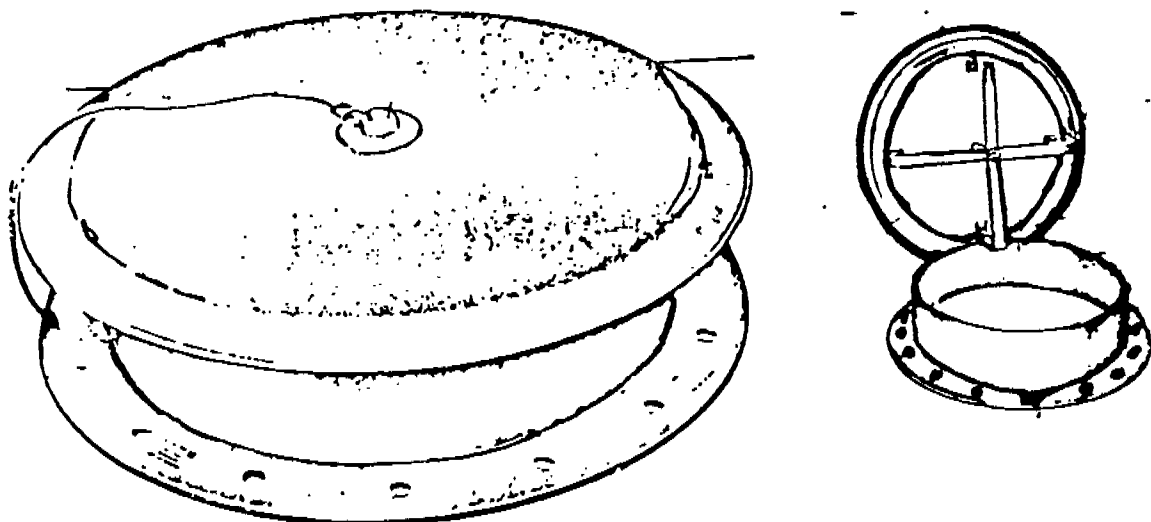
When a vacuum develops in the tank, the pressure outside the tank forces the vacuum pallet or weight to rise and admit air into the tank.

The PVRV's are very simple and work well. However, they can become corroded and fail to operate. Inspection is simple; merely check for corrosion and check that the pallets operate easily.

b. Emergency Pressure Relief Valve (ERV)

An emergency relief vent is sometimes installed on a tank in addition to a pressure in excess of what is normally encountered. For example, if a fire developed close to an atmospheric tank, the heat would probably cause abnormally high evaporation; and the regular two PVRV's could not handle the excess vapor load. ERV's are designed only to relieve such excess pressure. (Some types also have a vacuum relief.)

ERV's fit on a nozzle on the top of the tank. Excess pressure inside the tank causes the cover to rise, thus allowing the vapors to escape and relieve the pressure inside the tank. This is pictured below:



c. Weak Seam/Roof

Some atmospheric tanks are designed so that if the tank overpressures, the seam that ties the roof to the side will fail prior to any other seam. Of course, a roof flying off a tank is very hazardous in itself. The idea is that this is better than rupturing the sides of the tank and having a hazardous spill and possibly a fire, in addition to flying pieces of metal. We do not have weak seam roof design here in the Vinyl II Plant.

All atmospheric tanks in Vinyl II have a PVRV in conjunction with an ERV. Of course, all welds are not equally strong; and in the event of a failure of PVRV and ERV systems, a weld could blow. PVRV's and ERV's get inspected at regular intervals for proper operation. Furthermore, the importance of proper operation and thus good inspections is at this point apparent.

d. Pad/Depad System

Safe tank operations require that everyone understand the pad/depad system for atmospheric tanks. Products that should not become wet require a dry (we use only nitrogen) purge on each tank to prevent moisture pickup during the normal tank breathing that takes place as tank levels change. Plant instrument air is very dry and is often used. Nitrogen also can be and is used where oxygen cannot be present. A common setup is pictured on the next page.

The pressure regulator reduces system pressure from high pressure to two to three inches of water. This keeps the tank filled with dry air (nitrogen) at three-inch water pressure. When liquid is pumped from the tank, the regulator adds air (nitrogen) until tank pressure again reaches three-inch water pressure.

If the regulator breaks and pressure is not reduced down, the PVRV's and ERV's are there to protect the tank by relieving the excess pressure. Pressure gauges are installed downstream of all pad regulators and checked on rounds. A malfunctioning regulator should be immediately reported and red tagged.

PVRV's for standard tank designs are set to operate at four-inch water pressure and be full open at six-inch water pressure. The EVR's will not operate under normal conditions. They are set to operate at six-inch water and be full open at 7.5-inch water. The tanks are designed for eight-inch water. Standard vacuum settings are $\frac{1}{2}$ oz/in² (.866 water vacuum). The valves are sized to prevent the vacuum on the tanks from ever exceeding two-inch water.

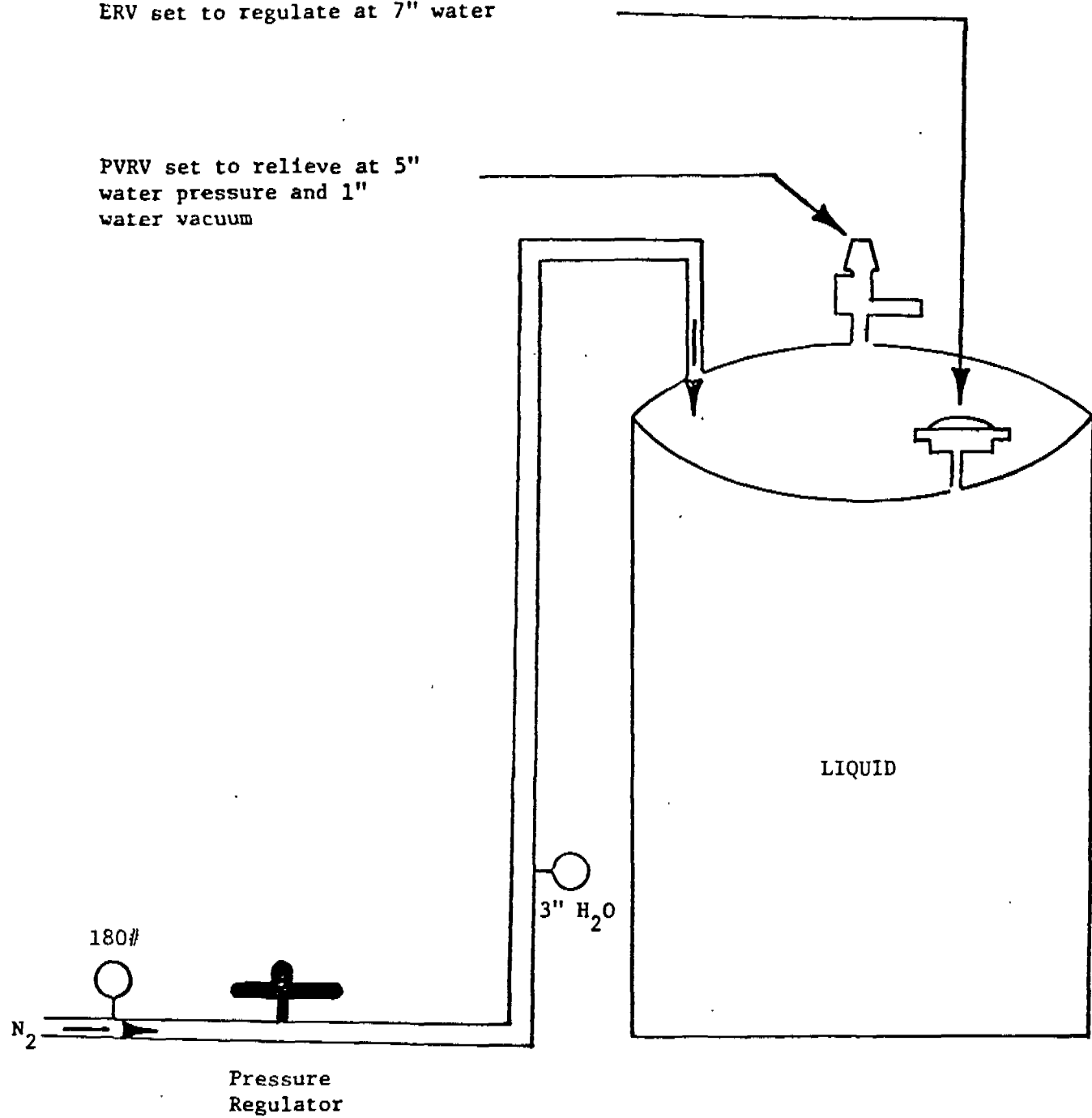
Exceptions to the settings mentioned above are T220 and T221 which are similar in construction to atmospheric tanks but designed for much higher pressure (70-inch water). The PVRV for these tanks is set to open at 50-inch water and have full capacity at 60-inch water. The ERV's are set to open at 60-inch water and have full capacity at 70-inch water.

G. Firefighting Equipment

One of our best firefighting tools for large fires is water. We have an underground water line that circles the block. This line supplies water to our deluge system, monitor stations, and fire hydrants. The attached block drawing shows this distribution system and location of monitors, deluge systems, and fire hydrants. The main header from which we receive our water is a 24-inch line, and the line that circles the block is 18 inches.

ERV set to regulate at 7" water

PVRV set to relieve at 5"
water pressure and 1"
water vacuum

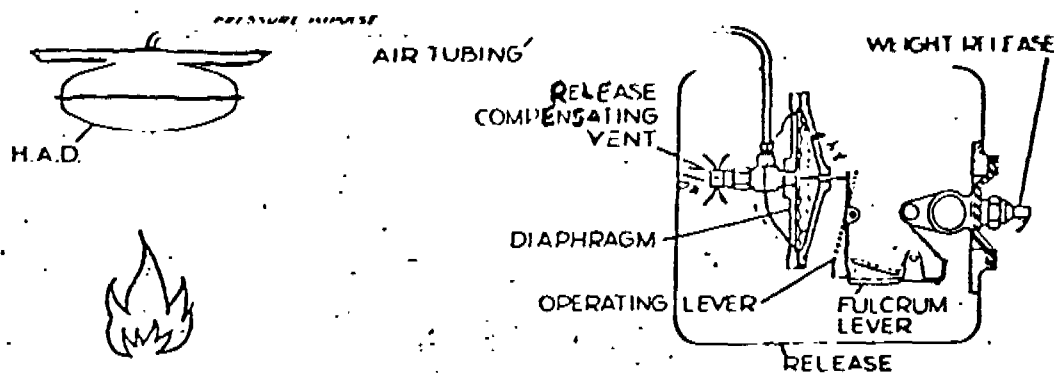


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We have 16 deluge systems that operate independently. There are four ways to actuate these systems:

1. A fire in the area and the heat is sensed by a heat-actuated device (HAD).
2. Manual release located at the deluge valve station.
3. Manual release by control located in the control room.
4. Analyzers detect a chemical leak, and the concentration is adequate to send a signal (electrical) that activates the deluge system in the area.

The analyzer and heat sensing devices are automatic. The drawing below helps to explain how these operate.



RATE-OF-RISE... BASIC COMPONENTS

The heat actuated device operates on the principle that air expands when heated. If confined, this expansion creates pressure. This pressure is transmitted through tubing to move a diaphragm which operates a series of levers to release a weight which opens the water valve, and a water deluge sprays the area.

There is a compensating vent that releases small increases in pressure such as is experienced by cold nights and warm days, sudden bright sunshine on the HAD, heat due to process changes, and even cool rain on the HAD followed by bright sunshine. This pressure compensating device is set by the equipment supplier and check by Security.

The analyzer sends an electric signal to a solenoid that operates the weight release pictured on the above drawing and trips the

sprinkler valve. Some situations that may deactivate or inadvertently set off a deluge system include:

1. The air tubing is bent and the tube blocked or cut so the pressure impulse from the HAD will not be sent to the diaphragm. A slight positive pressure is maintained on the system at all times; and if the tube is cut, this pressure is released. This can be detected by a pressure gauge located in the control room. Also, there is more than one set of HAD's and tubing to transmit back to valve station for each deluge area and thus, cut or blocked tubing on one sensing system has backup from another in the area.
2. It has happened that welding in the area and welding sparks have set off a deluge system.

The equipment protected by each deluge system is listed below:

<u>DV-1</u>	<u>DV-2</u>	<u>DV-7</u>
C110	C260	C510
RE110A/B (vapor line)	C270	D501
C111	C580	D502
P112A/B	D270	P500A/B/C
C120	D271	P510A/B
RE120B (vapor line)	P262A/B	R500
P120A/B	RE260A/B (vapor line)	E560
D101	P270A/B	E561
D102	P271A/B	D512
D104	P272A/B	D520
D110	RE270A/B (vapor line)	E520
D112	C140	P250A/B/C (area
D321	RE140A/B	coverage)
D322	2584 GPM	Around R531
D323		1592 GPM
K125		
GK125	<u>DV-3</u>	<u>DV-8</u>
LO125	C240	C560
P100A/B	E332	D540
P104A/B	K215	D541
STR111A/B/C/D	TK215	D550
P101A/B	LO215	D551
Area Coverage (C120	RE230	P550A/B
standby)	RE240	P541A/B
P323	C230	P551A/B
2565 GPM	900 GPM	P540A/B
		2016 GPM

DV-4, DV-5, and DV-6 are all 11350 GPM and are for future use.

DV-9

C540
C550
C570
P530A/B
P542
RE540
RE550
RE570
1386 GPM

DV-10

C130
RE130A/B (vapor line)
C150
RE150A/B
P131A/B
P150
C250
C255
D250
D255
D320
E320A/B
E325
K320
LO320
P250A/B
P251A/B
P256A/B
P255A/B
RE250
RE255
1658 GPM

DV-11

water curtain
(1200) at
1680 GPM/
nozzle 25
psig
noz. res.

DV-12

D130
D140
D260
T130
P260A/B
P132
P140A/B/C
P130A/B
2300 GPM

DV-13

C100
D122
D106
E122
E106
E121
D120
booster pump
870 GPM

DV-14

cover part
of DV-1
1613 GPM

DV-15

cover part
of DV-10
1908 GPM

DV-16

T120
P121A/B
1300 GPM

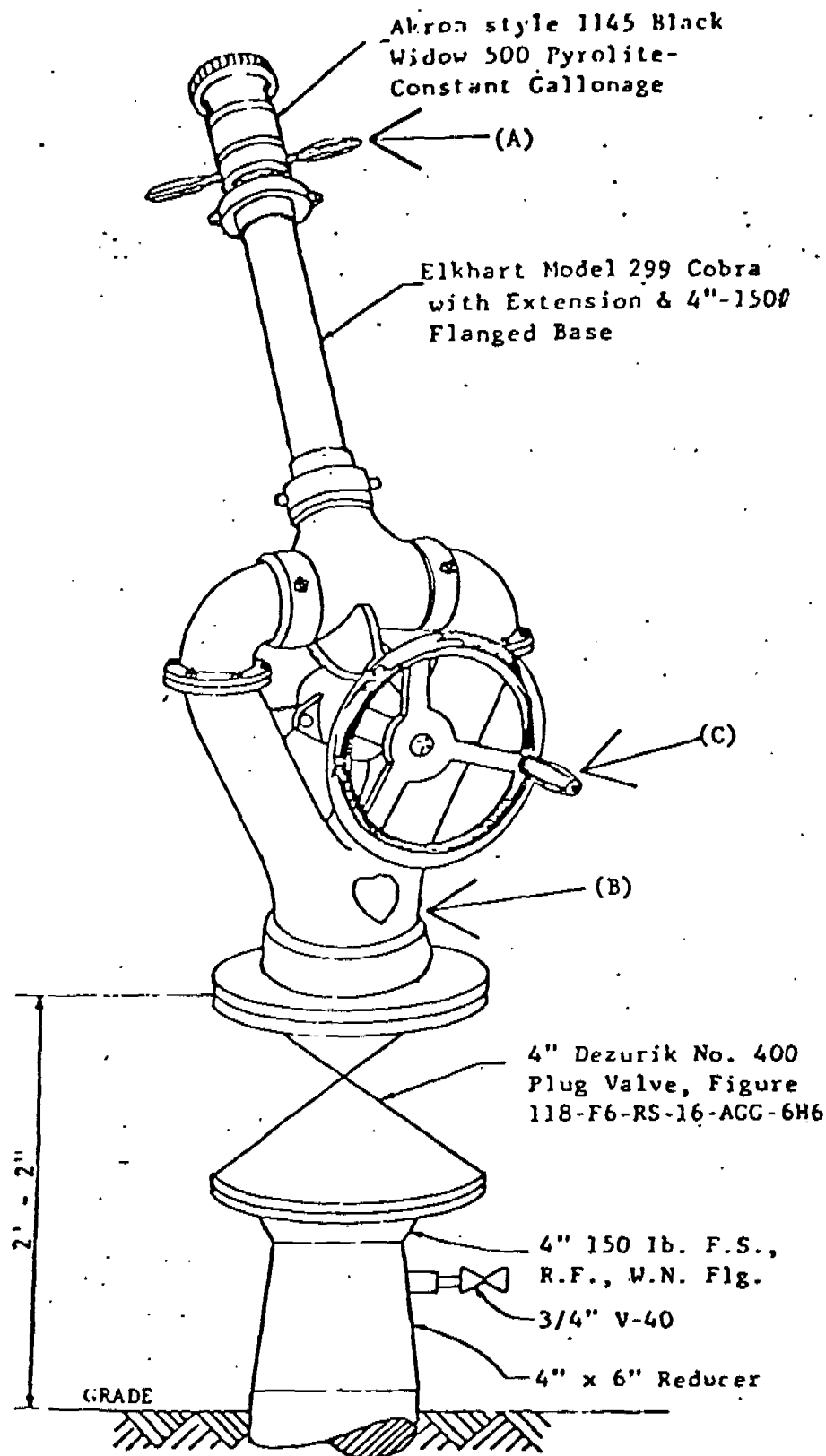
SAFETY SHOWER SYSTEM

In the Vinyl II Plant, we have installed safety showers throughout the area in order to get a convenient means of getting hazardous chemicals off of the body and out of the eyes in the fastest manner before chemicals have time to injure plant personnel.

If any person gets chemicals in their eyes, they should flush the eyes for at least 15 minutes or until medical attention can be obtained.

Each safety shower has an alarm button on it. It is located near the eye-wash fountain water valve. This alarm must be activated

MONITORS



The CHLOROTHENE Block has 24 deluge guns at present time.

Monitors throw a 500 gpm flow 90 - 100 feet. The flow can be adjusted from a spray to a solid stream by changing the position of control marked "A". The 500 gpm flow is constant and does not vary with the type stream used. The monitor swivels 360° around Point B, and the stream can be raised or lowered by moving handle C.

DELUGE GUN

(
whenever the shower is used. If chemicals get on your clothing, get to the nearest safety shower and remove the clothes so the chemical does not have time to penetrate the clothes and get on your skin. The person must wash with water, activate the alarm, and remain under the shower until medical attention arrives.

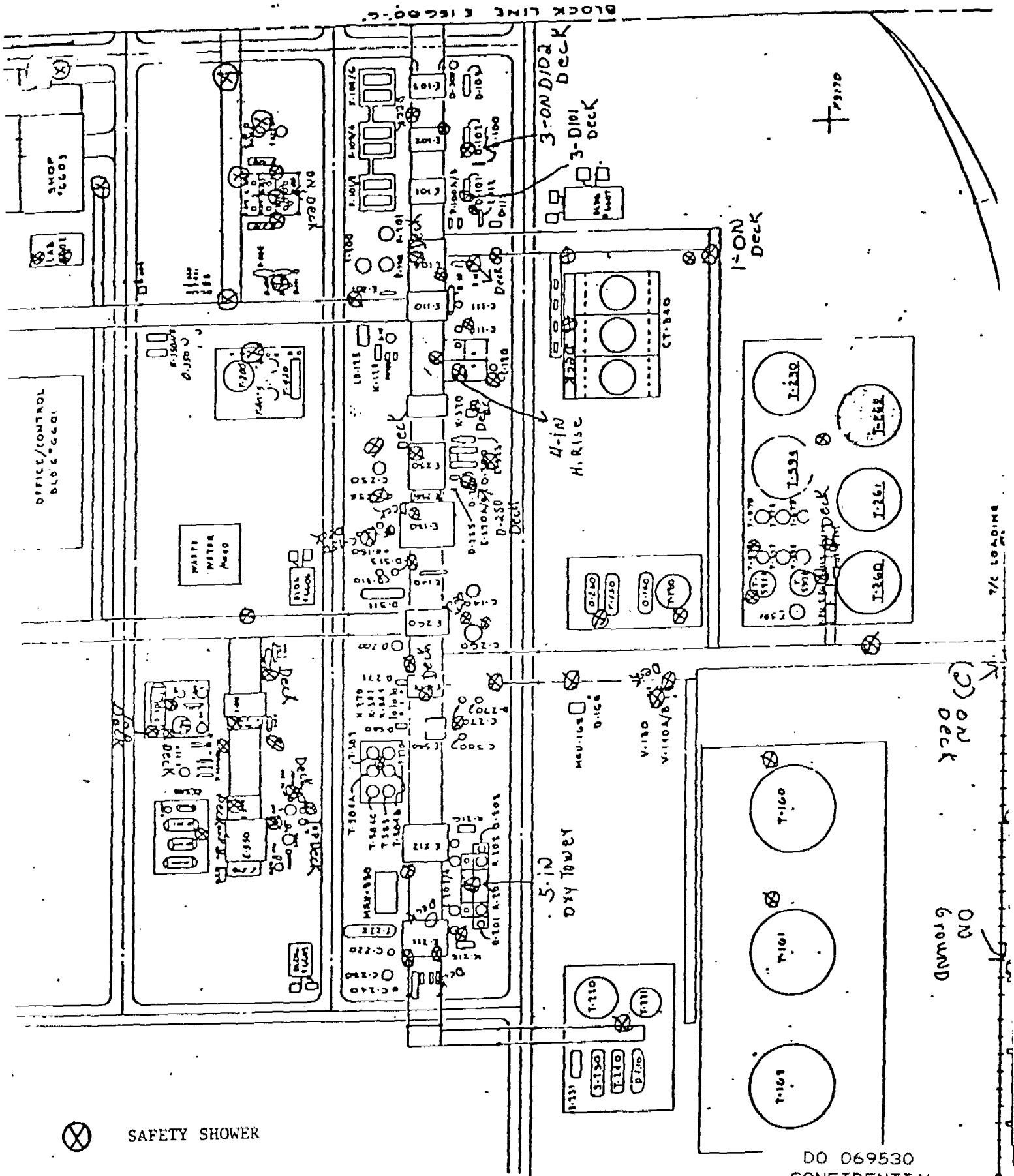
If you see a person get chemicals in his/her eyes or on the clothing, help the person get to a safety shower and flush eyes (if person has chemicals in their eyes), remove the clothing that has chemicals on them, and help the person get the chemical off with safety shower water as quickly as possible. Then call the control room and tell the boardman the problem, what chemical the person has on them, and whether or not the chemical is in the eyes. The boardman will then call emergency 333 and get medical assistance. The boardman will send someone to assist you and also send someone to meet the ambulance at the nearest roadway to help reduce the time it takes for medical assistance to arrive.

If personnel get chemical on them and they are wearing chemical goggles, DO NOT remove the goggles until the person's head and face have been washed, because chemical can be trapped on goggles; and when they are removed before washing the head, face, and goggles, this chemical may drip and fall into the eyes of the person and cause injury to the eyes.

The safety shower system uses potable water. In the Vinyl II Plant, the potable water is preheated in the winter to help make the washing process more bearable. This is a great deal of help because personnel in cold weather hesitate to use a safety shower. This in turn gives the chemical more time to cause injury. REMEMBER: the less time a chemical has to react on your body or in your eyes, the less severe the injury will be.

PLANT OVERVIEW

BOOK LINE 15600-0



SAFETY SHOWER

8. FIRE WATCHING

A. Purpose

To protect a plant and its personnel while potentially hazardous work is being performed.

B. Scope

The term "fire watching" can apply to any job associated with making and keeping an abnormal inplant procedure safe (i.e., welding in or near an area containing flammable materials, vessel entry, a vehicle driving through or into a hazardous area, etc.).

C. Requirements

1. Know how to properly use and test for correct operation of all safety equipment required (i.e., explosion meters, oxygen meters, fire extinguishers, fire hoses, Scott Air Paks, and gas masks). Explosion meters and oxygen meters must be checked in the control room for proper operation before each use and periodically during the day if used for a long span of time.
2. Know the type of flammable materials in the area involved and the proper type of fire extinguisher to use should they ignite. Have these extinguishers readily available, but not so close that a fire would keep you from getting to them.
3. Have service water hose laid out and available to hot work area.
4. Think out an emergency plan of action before a job is started.
5. Be alert to wind direction initially and consider potential upwind sources.

Fire watch personnel must feel secure in their knowledge of the plant and its potential upwind sources:

1. What chemicals are involved? Are they toxic or flammable? Soluble in water? Heavier or lighter than air?
2. Are there any safety valves or rupture discs that may release flammable or toxic materials to the atmosphere?
3. Are there any sample points nearby where a sample may be taken while hot work is being done (flammables are usually purged to the atmosphere when taking process samples)?
4. Dust and powders suspended in air can form an explosive mixture. Be sure this does not exist.
5. Is any flammable stored nearby?

D. Responsibility

During "fire watching" you are responsible for the safety of yourself, the people performing the job for which you are fire watching, all other plant personnel, and the protection of plant equipment associated with the job being performed.

1. Know yourself and point out to the maintenance personnel doing the work the nearest safety shower, eye wash fountain, and intercom phone.
2. Make sure everyone associated with the job will recognize the plant emergency signal and knows what to do if it is sounded (i.e., discontinue all hot work, extinguish all flames/cutting torches, stop all motors or engines, and get out of the plant process area using the most direct path possible by traveling upwind and proceeding to the maintenance warehouse. Make sure all personnel knows the directions (i.e., Down north, south, east, west).
3. Make sure everyone knows that safe work permits are automatically cancelled when the plant emergency signal is sounded and must be re-issued before work can continue.
4. While performing their work, most maintenance personnel (especially welders) cannot see around them. Warn them of any personnel hazards that may develop.

E. Procedures and Consideration

1. When checking an area for an explosive atmosphere for starting of stationary equipment or hot work, pay particular attention for process leaks around valve packing (both manual and control valves), leaks through vent and drain valves, and seepage leaks through flange gaskets.
2. Ditches and drains should be checked for explosive mixture, then covered with a tarp and have water spray applied to keep any hot metal or sparks from getting into them. Be extremely careful to properly do this. Ditch and drain fires are very prevalent.
3. If hot work is overhead, put a tarp underneath with a water spray on it to extinguish all hot metal and sparks.
4. Keep a watchful eye for anyone entering a hot work area. Make sure they are aware of the hot work so they will not release any flammable material.
5. Keep in touch with plant operating personnel so you will be aware of any operating malfunction which might cause a hazardous condition in the hot work area.

6. Be alert to any wind direction changes. Check out upwind sources.
7. The air monitors, environmental health VPC sample point, must be relocated to inside vessels during any vessel entry. They may be relocated or used as added protection during fire.

9. CHEMICAL HAZARDS IN THE VINYL II PLANT

All chemicals are hazardous. Too much water can kill. Too much air (oxygen) in your body results in hyperventilation; and unconsciousness can occur, which could result in a bad fall, etc. Our body requires sodium chloride (table salt). Many people have experienced a salt deficiency, resulting in heat exhaustion. Most people can tolerate a slight excess of salt in their system, while some with high blood pressure and certain cardiac conditions cannot.

Once again, let's go back to the statement: All chemicals are hazardous. The type and seriousness of the hazards depend on:

1. The chemical
2. Conditions of exposure (duration, repeated, single contact, temperature, concentration).
3. Type of exposure (skin contact, eye contact, inhalation, ingestion)
4. Time before treatment starts
5. Condition of the person(s) involved.

Let's look at Point 4 -- the amount of time before treatment starts. Undoubtedly, we think of professional treatment in relationship to this. This is wrong. If breathing stops, we should apply artificial respiration while waiting for medical help -- four or five minutes delay can make the difference between life and death.

Phenol is rapidly absorbed through the skin. Exposure of a relatively small area of the skin to concentrated phenol will result in a serious and painful burn, and even death. Immediate and thorough water wash can prevent these consequences.

These examples bring out that immediate first aid treatment is important and can be more important than skilled medical help that arrives a few minutes later.

The following write-ups on chemical hazards will help us to help ourselves and to help others in the event of chemical exposure. The following first aid rules are of prime importance in doing this:

1. If breathing has stopped, get the person out of the contaminated area and apply artificial respiration.
2. Skin exposure to chemicals requires immediate flushing with large amounts of water (such as supplied by a safety shower). Subsequent removal of clothing may be required. A minimum of 15 minutes washing time is suggested. Obtain medical attention.

3. In the event of eye exposure (any material foreign to the eye), immediate and thorough flushing with water is mandatory. Proper eye wash procedure is to be used:

- a. Hold eyelids open with the fingers.
- b. Rotate eyeballs continually.
- c. Minimum washing time is 15 minutes.
- d. Always obtain medical attention.

One more important work procedure: Each person will know the location of the closest safety shower and eye wash before starting work on a job. Also, the best pathway to reach the shower and eye wash is to be fixed in your mind before starting the job. It only takes a few seconds to do this. In the event of an accidental exposure to the skin or eyes, a person can "blow his cool." Knowing the location and having a pathway fixed in your mind will help you during the crisis.

A. Chlorine - Cl₂

Chlorine is a gas, under normal conditions, boiling at -30°F. The gas has a yellow-amber color with a pungent, irritating odor. At high concentration, the color is greenish yellow. Chlorine vapor is heavier than air and collects in low spots and low floor levels.

Chlorine gas strongly irritates and burns the eyes, nose, and throat linings. Permanent lung injury can result. It may be difficult to breathe due to the intense irritation. In extreme cases, death from suffocation can occur due to difficulty in breathing. Get into an area where fresh air is available. Keep warm and quiet, and get medical attention. If exposure occurs, effects from inhalation should be looked after and treated first. Use artificial respiration if breathing stops. Flush skin and eyes with water, remove clothing, and continue water flush for 30 minutes. Get medical attention.

A respirator possibly will help a person to get out of an area of chlorine exposure. A full-face mask with an acid canister will give short-time protection up to concentrations of 2%. Above 2% chlorine, a self-contained breathing apparatus is required.

Chlorine is so intensely irritating, that low concentrations in the air are readily detected. At higher concentrations, the severe irritation will drive a person out of the area unless unconscious or trapped. When detected, get out of the area into fresh air (90° to the wind direction).

Do not go back into a contaminated area unless you are adequately protected. Trained personnel using needed protective equipment should close off valves or make needed equipment adjustments to stop the release of chlorine vapors.

Chlorine is very reactive and may cause fire and/or explosion upon contact with ammonia, hydrogen, steel or finely divided metals, and

many organic chemicals. Because chlorine is highly reactive, special gasketing and packing materials are used in chlorine service. Garlock 7130 or teflon packing and oil-free packing are satisfactory.

It is very important to free piping, etc., of chlorine before welding, because at high temperature, the very reactive chlorine will burn on contact with steel. Equipment in chlorine service must be purged with dry air or nitrogen before welding. Before putting new equipment back into chlorine service, it must be cleaned so as to be free of oil, grease, and other materials that will react with chlorine. Trichloroethylene or perchloroethylene are satisfactory for degreasing piping and equipment.

B. Hydrochloric Acid - Aqueous HCl

This is a highly corrosive, colorless solution (trace impurities may impart a yellowish color). At high concentrations, the pungent odor of hydrogen chloride is released, which fumes strongly in moist air. Hydrochloric acid is very corrosive and readily attacks all the common metals to give off hydrogen which in concentration is explosive.

Concentrated hydrochloric acid causes severe flesh burns, and vapors irritate skin, eyes, and mucous membranes unless promptly washed away with copious quantities of flowing water. Permanent impairment of vision or total loss of sight may occur unless immediate action is taken. Prompt washing with water for at least 15 minutes is mandatory. Then get medical help. Intense pain may cause the exposed person to lose all self control, and forceful assistance may be required to get the person under a water shower.

Inhalation of the vapors released from concentrated hydrochloric acid produces severe irritation, resulting in coughing, burning of the throat, and a choking sensation. Prolonged exposure can cause death. Fortunately, irritation is so severe, people get out of the area into fresh air as fast as possible.

If swallowed, concentrated hydrochloric acid causes severe burns of the mouth, throat, and stomach. Intense throat and stomach pain develops; difficult in swallowing, intense thirst, nausea, vomiting, and diarrhea follow. In severe cases, death occurs.

Chemical goggles with a snug fit give good protection to the eyes, and an acid resistant suit and gloves give added protection. Again, in the event of skin and/or eye exposure, immediately wash with water for 15 minutes and get medical attention.

Where possibility of exposure to aqueous or AHCl exists (such as when opening up a line, etc.), a protective suit of rubber or plastic should be worn.

Tanks, lines, and equipment should be drained and thoroughly flushed with water before being repaired.

C. Anhydrous HCl - AHCl

This is a colorless gas which fumes strongly in moist air. It boils at -120°F .

Contact with the eyes, skin, and mucous membrane is painful; and severe burns can result unless promptly washed away with water. A minimum of 15 minutes washing time is recommended. Chemical goggles with a snug fit give added protection. Repeated skin exposure may result in dermatitis.

Inhalation of anhydrous HCl produces severe irritation of the respiratory tract -- coughing, burning, and a choking sensation result. Prolonged exposure can cause death. Exposure to 1500-2000 ppm is lethal in a few minutes.

AHCl vapors rapidly absorb water vapors from the air, and fine droplets of concentrated aqueous acid are formed, resulting in the white fumes associated with the release of AHCl. The body fights breathing in of these fumes in spite of the need for air. Thus, prompt evacuation of the contaminated area is mandatory to prevent unconsciousness. Fortunately, the intense irritation of these fumes gives ample warning and the desire to get out of the contaminated area.

Once out of the contaminated area, get under a water shower and rinse off body, clothing, and eyes all at the same time. Get assistance from others. After adequate and thorough water flush of body and eyes (15 minutes minimum), get medical attention. For further information related to AHCl exposure, see writeup on aqueous HCl.

Leaks of AHCl and concentrated aqueous HCl can be readily located using ammonia vapors which form a dense fog of NH_4Cl on exposure to HCl vapors. All spills of AHCl should be washed with large amounts of water.

Depressure and purge equipment with dry air or nitrogen prior to working. No water should be added to the equipment before it is purged free of the HCl as aqueous HCl will be formed which will be corrosive to steel equipment and generate flammable and explosive hydrogen gas.

D. Propylene - $\text{CH}_3\text{CH} = \text{CH}_2$

This is a colorless gas at room temperature and pressure, with the characteristic olefin (gassy) odor. In high concentrations, it has an anesthetic action. Inhalation causes mild intoxication, drowsiness, and inability to concentrate. Loss of consciousness results at higher concentrations. The chief concern is asphyxiation due to exclusion of oxygen. Contact with the liquid will cause frost burn due to the rapid vaporization. The odor is too mild to be a guide for noting the presence of propylene.

The primary hazard is possible ignition of vapor resulting from leaks. Leaks are readily detected due to the white frost at the point of the leak, and appropriate action can generally be taken before any large volume of gas or liquid is expelled.

The first thing to do in fighting a propylene fire of any size is to stop the flow of gas, along with cooling metal surfaces of tanks, piping, etc, in the area so rupture does not occur. Dry chemical, CO₂ extinguishers, or a fine water spray are suitable for extinguishing small propylene fires.

E. Sodium Hydroxide - Caustic - Lye - Caustic Soda - NaOH

When dissolved in water, this is a clear solution, readily miscible with water and has a "slippery" feeling. Flake caustic, which is also used in the Vinyl II Plant, is a white hygroscopic solid -- thin, flake-like particles.

Caustic is a strong alkali and can be very dangerous when improperly handled. As a solid or concentrated solution, caustic has a strong corrosive action on body tissues; and unless immediately removed, can result in severe burns, deep ulceration, and ultimately scarring. Signs and symptoms of irritation may not be evident immediately, and injury may result before you realize chemical exposure has occurred. The best action to take is to wear adequate and proper protective equipment.

Speed in removing caustic is of primary importance. The safety shower should be the first step -- clothing can be removed later under the shower. If there is caustic on the head or face, it is generally best not to remove chemical goggles until this has been thoroughly flushed off with water.

Contact with the eyes with caustic (as a solid, liquid, mist, dust) causes severe damage. Immediate and thorough water flushing is mandatory. Wash for a minimum of 15 minutes. Get medical help and guidance before stopping the water flush -- if need be, continue water wash using portable eye bath while going to medical help.

Caustic (as a solution) will penetrate down into the tissues of the eye, and prolonged washing is needed to remove. Inhalation of caustic dust or mist may cause severe damage to the respiratory tract and lung tissue. Discomfort or irritation will occur. Get out of the area and get medical treatment.

If caustic is swallowed, severe burns of the mouth, throat, esophagus, and stomach result. Get medical help. And while waiting, dilute by drinking large quantities of milk or water. Do not induce vomiting. Get medical help.

F. Ferric Chloride - Iron Chloride FeCl₃

This is a red-brown to brown-black solid that is very soluble in water. FeCl₃ is slightly hygroscopic. Water solutions are mildly

(
corrosive to iron and nickel-based metals. An FeCl_3 solution is very, very corrosive to copper metal and alloys. Thus, any spills of the material should be cleaned up, and the area flushed down with water to prevent subsequent corrosion.

FeCl_3 is not toxic. Ingestion will not cause injury. Repeated and prolonged contact with the skin results in irritation and a slight burn. Dust inhalation will result in irritation to nose and throat membranes. Contact with the eyes will result in considerable irritation. Immediate flushing of the eyes with water for 15 minutes is necessary. In the event of contact with the eyes, obtain medical attention.

Normal cleanliness (such as washing or a shower after working with FeCl_3) is recommended. This is especially the case if considerable dust is encountered. Shake out the clothing to remove dust before reusing or use clean clothing. Normal washing returns "dusty" clothing to a condition fit for reuse.

G. CHLOROTHENE® Nu - CHLOROTHENE® VG - (Inhibited Alpha-Tri)

This is a clear, colorless liquid with a slight chloroform-like odor. Inhibited alpha-tri is not highly toxic and presents no serious health problems except for breathing of excessive vapor concentrations. Prolonged skin contact defats the skin tissue, which may result in mild irritation. There is no hazard from skin absorption. If confined to the skin (under a ring or watch band, under a belt or tight clothing) so evaporation does not take place, a burn may result. A water flush along with removal of the confined condition prevents a burn. Do not wear soaked clothing until thoroughly dried.

When splattered in the eye, no serious injury results; but some pain and irritation results. Because of the possibility of impurities, a water flush for 15 minutes, followed by medical attention is good hygiene. Water flush also will reduce the irritation resulting from exposure to pure inhibited alpha-tri.

The odor of the vapors of inhibited alpha-tri are barely detectable at 100 ppm. The odor is slight, but not unpleasant, at 350 ppm, which is also the permissible eight-hour time weighted average. Brief exposures to 800 ppm are acceptable. At 1500 ppm, the odor will be strong and unpleasant, and dizziness may develop in 15 to 60 minutes. Eye irritation will develop at 1000 ppm. Respiratory irritation will rapidly be present at 2000 ppm, and a dizzy feeling and lightheaded reaction develop within five minutes. There are considerable differences in people relative to odor detection and eye and throat irritation, and a person's response level will vary, depending on his condition. However, the presence of a strong, intolerable odor is indicative of gross overexposure. Respiratory protection may be necessary. Concentrations in excess of 500 ppm and approaching 1000 ppm cause anesthetic effects and should be avoided.

Inhibited alpha-tri has no fire or flash point and normally presents no fire hazard, except in a closed or semi-closed container such as when cutting into a CHLOROTHENE® drum with a torch. Like other chlorinated solvents, exposure to hot surfaces and/or open flame results in a decomposition forming hydrogen chloride, carbon dioxide, carbon monoxide, and phosgene -- all hazardous materials. The irritant action of hydrogen chloride signals that such decomposition is taking place before enough phosgene has formed to become dangerous. The primary problem is corrosion of metal surfaces contacted by the decomposition products. Good venting is helpful.

H. 1,1,2-Trichloroethane - Beta-Tri

This is a colorless liquid with a chloroform-like odor which is slightly heavier than water. Beta-tri is highly toxic when inhaled. With a threshold limit value of 10 ppm, respiratory protection is mandatory when cleaning any spill.

Beta-tri may cause appreciable skin irritation when exposure are prolonged or repeated. Wash affected areas of the skin immediately with large amounts of water. Contaminated clothing should be removed promptly while under the shower. Such clothing should not be worn again until thoroughly cleaned and dried. If the liquid gets into the eyes, immediate and thorough flushing with water for 15 minutes should take place. Obtain medical attention.

Beta-tri is not considered flammable under normal usage. Contact with open flames and welding arcs results in breakdown of the beta-tri and the release of hydrogen chloride and small amounts of chlorine and phosgene.

Beta-tri, like other chlorinated organic materials, is insoluble in water and heavier than water. Thus, in the event of a spill, flooding the area with water reduces the release of harmful and irritating vapors by forming a water barrier on top of the beta-tri.

I. Oxygen - O₂

This is a colorless, odorless gas. Oxygen is a strong oxidizer. Oxygen is not toxic. Prolonged and repeated inhalation of pure oxygen might cause adverse effects. One adverse effect is hyperventilation and possible loss of consciousness. Gross contact with 100% gaseous oxygen should be avoided. Oxygen will absorb in clothing, and intense fire can result if lighted. The area should be evacuated and entered only with self-contained air mask. In the event of exposure to 100% oxygen, no smoking is permitted for 30 minutes.

Oxygen does not burn, but it does support combustion. The burning that takes place in 100% oxygen is very intense. For example, hot powdered iron will burn rapidly (oxidize) with a white hot flame in 100% oxygen. Organic material may ignite when exposed to 100% oxygen. All fires that develop in an oxygen atmosphere burn at a fast rate, and extreme difficulty is encountered in putting such a fire out.

J. Dowtherm G (30% Dowtherm A + 70% Biphenyl Phenyl Ether)

This is a high boiling off-white liquid. Dowtherm G is not highly toxic. Amounts which may be swallowed related to industrial handling will not cause injury. Single, prolonged skin exposure causes no effects. Slight irritation may develop after several repeated prolonged exposures.

Dust or mist cause no irritation of nose or throat. Slight irritation may develop to the eyes or respiratory passage on exposure to the vapors. Contact of the liquid to the eyes requires immediate water flush for 15 minutes. No injury to the eye is expected, but medical attention should be obtained to relieve the slight irritation expected and to assure complete removal of the liquid Dowtherm from the eye and eyelids.

Gross skin contact of liquid Dowtherm A requires a shower, and wash with soap and water to remove the Dowtherm. Clothing should not be reworn until decontaminated by thorough washing. Prolonged and extensive skin contact may result in absorption of toxic amounts of Dowtherm A. Good practices always dictate that chemical on the skin be removed.

If Dowtherm is sufficiently hot, it will burn. This very hot burning Dowtherm, if sprayed with water, will cause the water to rapidly evaporate with sufficient force to explode droplets of hot Dowtherm around the area. Such fine mists of Dowtherm can explode with considerable violence. Use a carbon dioxide extinguisher to put out Dowtherm fires.

K. Vinyl Chloride - V-1 - $\text{CH}_2\text{-CHCl}$

This is a colorless gas at normal conditions, with a fairly sweet odor. Vinyl chloride is stored as a liquid under pressure. There are several hazards relative to handling and exposure to vinyl chloride other than liver cancer.

Exposure to vinyl chloride vapors can deaden the small sensing ability. Concentrations greater than 500 ppm may cause dizziness, disorientation, and disturb equilibrium and coordination. This will be similar to drunkenness. Higher concentrations may very rapidly cause helplessness and unconsciousness. Remove to an uncontaminated area, and obtain medical help.

Liquid vinyl chloride on the skin may cause irritation. Frostbite and freezing of skin tissue due to rapid vaporization can occur. Any skin area splashed with vinyl chloride should be immediately washed with large amounts of water. If liquid vinyl chloride is splashed into the eyes, they should be immediately flushed with water for at least 15 minutes and medical attention obtained as soon as possible. Clothes wet with vinyl chloride should be removed immediately. Do this under a shower. Such clothing should not be worn again until thoroughly washed and dried.

Vinyl chloride is volatile and very flammable and can form explosive mixtures with air. In the event of a leak, eliminate all sources of ignition. Even an automobile operating downwind of a vinyl chloride release can be an ignition source. Most small vinyl chloride fires are readily extinguished with carbon dioxide or dry chemicals if properly applied.

Water spray from deluge systems and monitor guns control vinyl chloride fires and provide protection to equipment and vessels. The tremendous volume of small droplets of water from a deluge system will usually control and put out a vinyl chloride fire. Of course, valving off lines to stop the source of vinyl chloride feeding the fire is also mandatory with large fires. Vinyl chloride floats on water, which adds to the difficulty in putting out a fire that involves large quantities of vinyl chloride. The flush water containing vinyl chloride is a source for re-ignition.

Hydrogen chloride, phosgene, and carbon monoxide are some of the products released when vinyl chloride burns. These add to the downwind hazard of a vinyl chloride fire. The water spray is a great help to remove these gases.

L. Ethylene

This is a colorless gas. Explosive hazards are extreme at proper concentrations. Open flame, sparks, local hot spots, and static electricity are to be avoided. Breathing vapors may cause dizziness or drowsiness. Effects are generally temporary, and relief is obtained shortly on return to fresh air. High concentrations with oxygen depletion will cause unconsciousness and death.

Carbon dioxide or dry chemicals handle a small fire. Stop the flow of gas to extinguish a large fire. Copious, large amounts of water spray cool and protect equipment; and cooling disperses the ethylene vapors.

Boiling Point = -155°F
Explosive Limits = 3% - 34% by volume
Faint odor similar to acetylene

M. Ethylene Dichloride (EDC)

EDC is a flammable liquid. Vapors are moderately explosive. Open flames, sparks, and local hot spots are to be avoided. Combustion products include hydrogen chloride and phosgene. EDC irritates the skin and mucous membranes when exposed. Systematic damage occurs with long exposure. Short exposure to vapors will cause tiredness, lethargy, and nausea.

Water spray or fog foam readily put out large EDC fires when properly applied. Carbon dioxide and dry chemicals are effective and normally are used to put out smaller fires. Gently smothering an EDC fire

with water and allowing the heavier EDC to settle and layer-out is very effective. Self-contained breathing equipment must be used when exposure to combustion products or EDC vapors at higher than 2% is likely.

EDC, if left on the skin and covered with clothing (i.e., socks, shirt, pants), can result in a severe burn or blister. Contaminated clothing should be removed and the affected area washed. Clothing should not be reused until thoroughly washed and dried. A contaminated belt or shoes if reused before removal of EDC, can cause severe painful blisters to form on the skin under the belt or shoes.

N. Fuel Gas (Methane)

This is a colorless gas and presents extreme fire and explosive hazards. Open flames, sparks, local hot spots, and static electricity are to be avoided. Methane is a colorless and odorless (unless odor-producing materials are added), and exposure can occur without knowledge. Dizziness and drowsiness can readily occur. Relief is obtained shortly on return to fresh air. High concentrations with oxygen depletion will cause unconsciousness and death.

Carbon dioxide or dry chemicals will handle a small fire. Stop the flow of gas to extinguish large fires. Use water spray to protect equipment.

O. Nitrogen - N₂

This is a colorless gas, colorless liquid, and non-flammable. The only danger from inhalation of nitrogen lies in diluting the oxygen of the air to a point so low that it can no longer support life. Therefore, nitrogen acts as a simple asphyxiant. In a pure nitrogen atmosphere, there is no warning; and unconsciousness develops rapidly -- in seconds. Immediate removal to fresh air is mandatory. If breathing has stopped, use artificial respiration.

When nitrogen is shipped, it is stored in steel cylinders under high pressure. If these tanks are dropped or otherwise broken, metal pieces will fly at great velocity away from the point of impact and endanger personnel at work nearby. Cylinders of nitrogen gas under high pressure should be transported carefully. They should not be dropped and should be stored in a cool place. They should be chained to walls. If a tank of nitrogen should break in an enclosed place, such as a room with no ventilation, the presence of so much nitrogen gas could dilute the oxygen present to a point where it would no longer support life.

P. Calcium Chloride - CaCl₂

Calcium chloride is a white to off-white solid (pellets). It is very hygroscopic; and when exposed to the atmosphere, it picks up water to

form a solution that is corrosive to metals. Such a strong solution will irritate the skin and eyes and possibly yield transient corneal injury and superficial skin burns.

When handling calcium chloride pellets, use a dust respirator and long-sleeved clothing. Tight fitting monogoggles prevent dust from getting into the eyes. Gloves and face covering may be required, depending on the severity of the dust problem. Calcium chloride is very soluble in water, and a water flush readily removes materials. In the event of eye contact, flush with water for 15 minutes and obtain medical help.

Q. Methylene Chloride - CH_2Cl_2

This is a colorless, volatile liquid soluble in alcohol and ether. This material is very dangerous to the eyes. Except for its property of inducing narcosis or a numbing effect, a stupor, and unconsciousness, it has little toxic effects. Its narcotic powers are quite strong, and in view of its great volatility, care should be taken.

Experiments have shown that 25000 ppm concentrations for two-hour exposures were not lethal. Concentrations of 7200 ppm after eight minutes caused pricking-tingling of the extremities. At 2300 ppm, there was no feeling of dizziness during one-hour exposures; but nausea did occur after 30 minutes of exposure. The limit of perception by smell is 317 ppm. This gives adequate warning and should be heeded by personnel exposed to methylene chloride. Also, the ability to smell the product is reduced in longer exposure.

Methylene chloride is very irritating to the eyes as strong vapors or as a liquid. Immediately flush with water for 15 minutes and obtain medical help. Methylene chloride defats the skin tissues, and prolonged or repeated exposure can result in irritation and sores. Methylene chloride under a ring, wristwatch band, a belt, or held in close proximity to the skin by clothing is very irritating and eventually will cause skin burns unless washed thoroughly. In the event of gross contact, copiously flush with water and remove clothing and such items that prevent thorough flushing. Obtain medical help.

It will not form explosive mixtures with air at ordinary temperatures; however, it can be decomposed by contact with hot surfaces and open flame, and it can then yield toxic fumes, which are irritating and will give warning of their presence. To fight fires of this material, water (fog or spray), foam carbon dioxide, carbon tetrachloride, or dry chemicals may be used.

10. SAFETY CHECKLISTS

WEEKEND SAFETY CHECKLIST

DAY SHIFT

Safety Showers - check alarms, flush, and check mechanical condition.

Fire Extinguishers - check condition, seal, hanger & paint.

Intercoms - visual inspection, check all 3 channels.

Deluge guns - flush and check condition.

Sprinkler system deluge valves - make sure block valves are unblocked and record supervisory pressure on system.

NOTE: WRITE MMR'S ON EVERYTHING THAT NEEDS REPAIRING.

COOLING TOWER AREA

OK
Y N

DV 11A Block valve open
Supervisory Press. _____ oz.

DV 11B Block valve open
Supervisory Press. _____ oz.

Intercom in Sub #3
75# CO₂ in Sub #3 ()
15# CO₂ in Sub #3
20# DC east of CT-340
20# DC at P-340B (#84)
Safety Shower at P-340B
Intercom at P-340B
Deluge Gun north P-340B
Deluge gun south of K-320
DV 10 (NW of CT-340) block valve open
Supervisory Press. _____ oz.

Intercom top deck CT-340
20# DC top deck east side CT-340 (#83)
20# DC top deck west side CT-340 (#82)
Safety Shower bottom of V-260's
Safety Shower deck of V-260's
Intercom at FS 170
20# DC at FS 170 (#87)

WEEKEND SAFETY CHECKLIST - DAY SHIFT (Continued)

			OKAY	
			<u>Y</u>	<u>N</u>
<u>STORAGE TANK AREA</u>				
<u>Type</u>	<u>Location</u>	<u>Comments</u>		
Safety Shower	West T260		—	—
Intercom	West T260		—	—
Fire Extinguisher	North T260 #73		—	—
Safety Shower	North T260		—	—
Fire Extinguisher	North T261 #74		—	—
Intercom	North T261		—	—
Safety Shower	South T594		—	—
Fire Extinguisher	South T230 #75		—	—
Intercom	E232 Fan Deck		—	—
Safety Shower	E232 Fan Deck		—	—
Safety Shower	T160		—	—
Intercom	T160		—	—
DV 6	South T160 Valve Unblocked		—	—
	Supervisory Pressure _____		—	—

REFLUX STORAGE AREA (V-140 AREA)

<u>Type</u>	<u>Location</u>	<u>Comments</u>	<u>Y</u>	<u>N</u>
Fire Extinguisher	West D260 #69		—	—
Safety Shower	West T130		—	—
Safety Shower	P121		—	—
Intercom	West D130		—	—
Fire Extinguisher	West D140 #70		—	—
Safety Shower	D165		—	—
Deluge Gun	West E165		—	—
Deluge Gun	West V140		—	—
Safety Shower	Ground V140		—	—
Intercom	P160		—	—
Safety Shower	V140 deck		—	—
DV 16	East E142 Valve Open		—	—
	Supervisory Pressure _____		—	—
Fire Extinguisher	South T120		—	—
DV 12	North D260 Valve Open		—	—
	Supervisory Pressure _____		—	—
Intercom	V140 Deck		—	—

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WEEKEND SAFETY CHECKLIST - DAY SHIFT (Continued)

T-220 STORAGE AREA

<u>Type</u>	<u>Location</u>	<u>Comments</u>	<u>Y</u>	<u>N</u>
Deluge Gun	South R201		—	—
Deluge Gun	South K215		—	—
Deluge Gun	Oxygen Regulator		—	—
Ladder	Oxygen Regulator		—	—
Spanner Wrench	Oxygen Regulator		—	—
Fire Extinguisher	East T240		—	—
Fire Extinguisher	West T220		—	—
Safety Shower	West T220		—	—
Intercom	West T220		—	—

OXY AREA

<u>Type</u>	<u>Location</u>	<u>Comments</u>	<u>Y</u>	<u>N</u>
Intercom	Analyzer House		—	—
Fire Extinguisher	K215		—	—
Spanner Wrench	K215		—	—
Intercom	K215 Deck		—	—
Safety Shower	South C211		—	—
Safety Shower	Southeast Ground		—	—
Intercom	Ground by Stairs		—	—
Safety Shower	2nd Deck		—	—
Intercom	2nd Deck		—	—
Fire Extinguisher	2nd Deck		—	—
Spanner Wrench	2nd Deck		—	—
Safety Shower	3rd Deck		—	—
Intercom	3rd Deck		—	—
Fire Extinguisher	3rd Deck		—	—
Safety Shower	4th Deck		—	—
Intercom	4th Deck		—	—
Fire Extinguisher	4th Deck		—	—
Spanner Wrench	4th Deck		—	—
Safety Shower	Top Deck		—	—
Intercom	Top Deck		—	—
Fire Extinguisher	Top Deck		—	—
Spanner Wrench	Top Deck		—	—

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WEEKEND SAFETY CHECKLIST - DAY SHIFT (Continued)

C-230 AREA

<u>Type</u>	<u>Location</u>	<u>Comments</u>	<u>Y</u>	<u>N</u>
Fire Extinguisher	E332 #38		—	—
Deluge Gun	E332		—	—
DV 3	T222 Valve Open		—	—
	Supervisory Pressure	—	—	—
Safety Shower	E332		—	—
Safety Shower	C220		—	—
Fire Extinguisher	South C230		—	—
Intercom	C230		—	—
Spanner Wrench	C230		—	—
330# CO2 Fire Ext.	Analyzer House		—	—

D-270, C-270, K-270, & T-270 AREAS

<u>Type</u>	<u>Location</u>	<u>Comments</u>	<u>Y</u>	<u>N</u>
Safety Shower	South D270		—	—
Safety Shower	West D270		—	—
Fire Extinguisher	D270 40#		—	—
Deluge Gun	North D271		—	—
Fire Extinguisher	D200 45#		—	—
Safety Shower	D271		—	—
Intercom	D584		—	—
Safety Shower	T270		—	—
Fire Extinguisher	T584		—	—

FAN DECK

<u>Type</u>	<u>Location</u>	<u>Comments</u>	<u>Y</u>	<u>N</u>
Fire Extinguisher	Top Stairs D200 50#		—	—
Safety Shower	E271		—	—
Fire Extinguisher	Top Stairs T584 50#		—	—
Safety Shower	E211		—	—
Safety Shower	E220		—	—
Intercom	E211		—	—
Fire Extinguisher	West E230		—	—

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SAFETY CHECK LIST

Fire Extinguishers - check seal, paint, type and visual inspection.

Intercoms - Check all 3 lines working, visual inspection

Safety Showers - Check alarm, working condition, paint and visual inspection.

NAME	NO.	TYPE	LOCATION	OK?	COMMENT
Fire Extinguisher	11	10# DC	West Wall 13KV RM		
Fire Extinguisher	10	CO2	North Wall 13KV RM		
Protective Suit & Rubber Gloves			Coat Rack 13KV RM		
Intercom			13 KV Room		
Fire Extinguisher		75# CO2	Outside West 13 KV RM		
Fire Extinguisher	30	DC	Entrance to Parking Lot		
Fire Extinguisher	13	DC	Pipe rack west of cont. rm.		
Fire Extinguisher	12	DC	Pipe rack by fish pond		
Fire Extinguisher	35	CO2	Sub #2		
Fire Extinguisher	36	CO2	Sub #2		
Intercom			Sub #2		
Safety Shower			T-400		
Fire Extinguisher		DC	T-400		
Intercom			K-350		
Fire Extinguisher	24		K-350		
Safety Shower			D-430		
Intercom			E-431		
Fire Extinguisher		DC	E-431		
Intercom			F-420		
Safety Shower			F-420		
Fire Extinguisher		DC	F-420		
Intercom			P-450		
C-110 H2O curtain unblocked?			Air Pressure?		
Deluge Gun			T-422		
Safety Shower			C-423		
Fire Extinguisher	32	DC	P-423		
Safety Shower			D-411		
Fire Extinguisher	31	DC	P-412		
Deluge Gun			P-412		
Fire Extinguisher	29	DC	B-412		
Safety Shower			B-412 Deck		
Fire Extinguisher	30	DC	North end of deck		
Safety Shower			R-400		
Fire Extinguisher	20	DL	Shop		
Fire Extinguisher	19	DC	Shop		
Intercom			Shop		
Fire Extinguisher	15	DC	Warehouse		
Fire Extinguisher	14	DC	Warehouse		
Fire Extinguisher		DC	Truck Loading Rack		
Safety Shower			Truck Loading Rack		
Intercom			Maint. Office		
Intercom			Elect. Office		
Intercom			Inst. Shop		

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WEEKEND SAFETY CHECKLIST - DAY SHIFT (Continued)

HAMMER BLIND CHECK LIST

Is hammer blind installed properly?
Is lock and cable installed properly?

WRITE MMR ON ITEMS THAT NEED REPAIR.

	<u>Y</u>	<u>N</u>
D200	—	—
E165	—	—
V141 A/B	—	—
V140 A/B	—	—
V130	—	—
E142	—	—
E143	—	—
E164	—	—
D160	—	—
T120	—	—
C140	—	—
C130	—	—
D320	—	—
E325	—	—
C100	—	—
E106	—	—
C120	—	—
E120	—	—
E121	—	—
E122	—	—
D112	—	—
D300	—	—
D101	—	—
D102	—	—

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WEEKEND SAFETY CHECK LIST

NIGHT SHIFT

Safety Showers - check alarms, flush, and check mechanical condition.

Fire Extinguishers - check condition, seal, hanger and paint.

Intercoms - visual inspection, check all 3 channels

Deluge guns - flush & check condition

Sprinkler system deluge valves - make sure block valves are unblocked and record supervisory pressure on system.

NOTE: WRITE MMR'S ON EVERYTHING THAT NEEDS REPAIRING.

	OK	
	YES	NO
1. Intercom - southwest of P-311	___	___
2. DV-2 - north of P-311 block valve open Supervisor Press. ___ oz.	___	___
3. Deluge gun north of C-130	___	___
4. Safety shower west of C-130	___	___
5. Safety shower reboiler deck C-130	___	___
6. Safety shower south of D-313	___	___
7. 20# DC fire extinguisher south of D-200	___	___
8. Safety shower south of C-260	___	___
9. Intercom south of C-130	___	___
10. Safety shower 2nd deck east of E-256	___	___
11. 20# DC Fire Extinguisher E-320 deck	___	___
12. Safety shower south of D-320	___	___
13. Safety shower north of C-255	___	___
14. DV 14 & DV 15 north of C-250	___	___
15. Deluge gun north of K-125	___	___
16. Safety shower east of C-250	___	___
17. 20# DC fire extinguisher north side pipe rack and elevator	___	___
18. Intercom north of E-325	___	___
19. 20# DC fire extinguisher top K-320 deck	___	___
20. Intercom north side K-320 deck	___	___
21. Safety shower K-320 deck	___	___
22. 20# DC fire extinguisher southeast corner K-320 deck	___	___
23. Deluge gun south of K-320	___	___
24. DV-10 south of D-320 block valve open Supervisory Press. ___ oz.	___	___
25. Deluge gun south of C-140	___	___
26. Safety shower north of elevator	___	___
27. Safety shower south of K-320 suction line	___	___
28. Intercom - east of C-120	___	___
29. Safety shower south of C-110 & C-111	___	___

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WEEKEND SAFETY CHECK LIST - NIGHT SHIFT (continued)

	OK	
	YES	NO
30. DV 11 A & DV 11 B northeast corner cooling tower block valve open. Supervisor Press _____ oz. _____ oz.	_____	_____
31. Fire extinguisher west of D-112	_____	_____
32. Safety shower west of D-112	_____	_____
33. Safety shower D-104 deck	_____	_____
34. 20# DC fire extinguisher D-104 deck	_____	_____
35. Safety shower north of C-111 strainers	_____	_____
36. Safety shower southeast of D-111	_____	_____
37. 20# DC fire extinguisher top K-125 deck	_____	_____
38. Intercom - K-125 deck.	_____	_____
39. Intercom - northwest corner of K-125 lube oil console	_____	_____
40. 20# DC - Fire extinguisher northwest corner of K-125 oil console	_____	_____
41. DV 1 & DV 13 north of D-125 block valves open Supervisory Press. DV-1 _____ oz. DV-13 _____ oz.	_____	_____
42. Safety shower south of D-125	_____	_____
43. Intercom north of F-101	_____	_____
44. 20# DC fire extinguisher bottom stairs north F-103	_____	_____
45. 20# DC fire extinguisher under pipe rack north D-300	_____	_____
46. Deluge gun south of D-300	_____	_____
47. 150# DC fire extinguisher south of D-102	_____	_____
48. 20# DC fire extinguisher bottom ladder under D-102	_____	_____
49. Intercom north of P-102	_____	_____
50. Deluge gun - south of D-101	_____	_____
51. 20# DC fire extinguisher bottom stairs under D-101	_____	_____
52. Safety shower northeast of E-112	_____	_____
53. Intercom - north of P-100A	_____	_____
54. Intercom - south of F-101	_____	_____
55. 20# DC fire extinguisher reheat deck north F-104	_____	_____
56. 15# CO ₂ fire extinguisher reheat deck north F-104	_____	_____
57. 20# DC fire extinguisher reheat deck north F-102	_____	_____
58. Intercom reheat deck south F-101	_____	_____
59. Intercom reheat deck south F-104	_____	_____
60. Intercom top deck of furnace area	_____	_____
FIN FAN DECK		
61. Safety shower east of E-102 fans	_____	_____
62. 15# CO ₂ fire extinguisher north hand rail E-102 fans	_____	_____
63. 15# CO ₂ fire extinguisher south hand rail E-101 fans	_____	_____
64. Safety shower 2nd & 3rd deck of D-102	_____	_____
65. Intercom top of D-101 east hand rail	_____	_____
66. Safety shower top of D-101 southwest corner Safety shower 2nd deck D-101	_____	_____

WEEKEND SAFETY CHECK LIST - NIGHT SHIFT (continued)

	OK
	YES NO
67. 20# DC fire extinguisher 3rd deck stairs D-101	_____
68. 15# CO ₂ fire extinguisher south hand rail E-104 fans	_____
69. 15# CO ₂ fire extinguisher south hand rail E-110 fans	_____
70. Intercom north hand rail E-110 fans	_____
71. Safety shower north hand rail south C-250	_____
72. Intercom north hand rail south of C-250	_____
73. Safety shower north hand rail south C-130	_____
74. 20# DC fire extinguisher north hand rail north E-140	_____
75. Intercom north hand rail north of C-260	_____

HIGH RISE AREA

76. Intercom top deck west side	_____
77. 20# DC fire extinguisher top of stairs	_____
78. Safety shower north hand rail	_____
79. Intercom 4th floor	_____
80. Safety shower 4th floor	_____
81. 20# DC fire extinguisher 4th floor	_____
82. Safety shower 3rd floor	_____
83. 20# DC fire extinguisher 3rd floor	_____
84. Safety shower 2nd floor	_____
85. Safety shower east of C-120 intermediate deck	_____
86. Intercom - stairway between ground and 2nd deck	_____
87. 20# fire extinguisher - stairway between ground and 2nd deck	_____
88. Intercom in elevator	_____
89. Check and lube as necessary all escape doors on elevator shaft	_____

CONTROL ROOM SAFETY CHECK

Remote dump valves - check & record pressure

<u>NAME</u>	<u>PRESSURE</u>	<u>COMMENTS</u>
DV-1		
DV-11		
DV-14		
DV-13		
DV-15		
DV-10		
DV-2		
DV-3		
DV-9		
DV-7		
DV-8		
DV-12		
DV-6		
DV-16		

INTERCOM CHECK

<u>LOCATION</u>	<u>OK?</u>	<u>COMMENTS</u>
Control board east	___	
Control board center	___	
Control board west	___	
Console east	___	
Console west	___	
S.S. Office	___	
Behind control board east door	___	

FRESH AIR SUPPLY & GAS MASK

Check air supply with mask. Block air check alarm. Check gas mask cylinder & visual inspection.

<u>LOCATION</u>	<u>OK?</u>	<u>COMMENTS</u>
Control board east	___	
Control board center	___	
Control board west	___	
Gas mask (3 ea.)	___	

WEEKEND SAFETY CHECK LIST - NIGHT SHIFT (continued)

SCOTT AIR PACK

Check cylinder pressure, alarm and visual inspection

<u>LOCATION</u>	<u>OK?</u>	<u>COMMENTS</u>
Scott Air Pack #1	_____	
Scott Air Pack #2	_____	
Scott Air Pack #3	_____	
Scott Air Pack #4	_____	
Scott Air Pack #5	_____	
Scott Air Pack #6	_____	
Extra Cylinders (6 ea.)	_____	

FIRE EXTINGUISHERS

Check for broken seals - damage or needing paint

<u>LOCATION</u>	<u>TYPE</u>	<u>NO.</u>	<u>OK?</u>	<u>COMMENTS</u>
East exit door	20# DC	7	_____	
West exit door	CO2	6	_____	
Hall to locker rooms	10# DC	8	_____	

FIRE SUITS

Check for worn spots or any damage.

Fire suits (2 ea.) OK? _____ COMMENTS -

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CONTROL ROOM SAFETY CHECKLIST - NIGHT SHIFT (Continued)

COMBUSTIBLE GAS MONITORS

An MMR should be written on any alarm that is off, reading sub-zero or over 10 or on by-pass.

<u>NAME</u>	<u>NUMBER</u>	<u>IN-SERVICE Y OR N?</u>	<u>BY-PASS Y OR N?</u>	<u>ZERO READING</u>	<u>COMMENTS</u>
F101 & F102	7 A&B				
F104 & F106	8 A&B				
K125 & F110	6 A&B				
D111 & D104	9 A&B				
D101 & E112	10 A&B				
D101 & D102	11 A&B				
D102 & D103	12 A&B				
Hi Rise Grade	34 A&B				
C250	17 A&B				
K320 Deck	33 A&B				
K320 Grade	32 A&B				
F110	46 A&B				
F201	47 A&B				
F101 & F103	48 A&B				
Upper D101	49 A&B				
Upper D102	50 A&B				
Upper Upper D101	52 A&B				
Upper Upper D102	51 A&B				
C250 & C230	22 A&B				
C203 & P330	21 A&B				
Oxy Storage	14 A&B				
Top R201	36 A&B				
C260 & C270	19 A&B				
T270	20 A				
Upper High Rise	35 A&B				
C130 & C150	18 A&B				
Reflux Storage	38 A&B				
Vinyl Filters	37 A&B				
T160	39 A&B				
Loading Rack West	43 A&B				
Loading Rack East	42 A&B				
Inhibitor Storage	40 A&B				
T261	41 A&B				
T400	2 A				
Oxidizer F410	3 A&B				
F420	4 A				
Pit450	5 A				
K350	1 A&B				
Rain Water Pond	31 A				
T161	55 A&B				
Sub #2	27 A				
Sub #3	26 A				
Control Room	38 A				
Ctrl. Room Air In	24 A				
Lab	44 A				
Lab Air In	45 A				
Maintenance Shop	16 A				
Warehouse	15 A				

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OFFICE SAFETY CHECK LIST

Fire Extinguishers - check seal, paint, right type, visual inspection.

Intercoms - check all 3 lines, working, visual inspection.

<u>NAME</u>	<u>NO.</u>	<u>TYPE</u>	<u>LOCATION</u>	<u>OK?</u>	<u>COMMENTS</u>
Fire Extinguisher	5	CO ₂	Behind board east end	___	
Fire Extinguisher	4	CO ₂	Behind board west end	___	
Fire Extinguisher	1	CO ₂	Hall	___	
Intercom			Instrument Office	___	
Intercom			Ashe Office	___	
Intercom			Bennett's Office	___	
Intercom			Secretary's Office	___	
Intercom			Paul's Office	___	
Fire Extinguisher	2	10# DC	Hall	___	
Intercom			Hank's Office	___	
Intercom			Heard's Office	___	
Intercom			Nevill's Office	___	
Intercom			Ramon's Office	___	
Intercom			Pat's Office	___	
Fire Extinguisher	3	10# DC	Lunch Room	___	

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SAFETY CHECK LIST (continued)

<u>NAME</u>	<u>NO.</u>	<u>TYPE</u>	<u>LOCATION</u>	<u>OK?</u>	<u>COMMENTS</u>
Safety Shower			By Shop	—	
Fire Extinguisher	36		Walkway to Shop	—	
Fire Extinguisher	16		Cataly's Room	—	
Fire Extinguisher			Model Room	—	
Fire Extinguisher	31		Block valve 235# steam	—	
Safety Shower (2 ea)			Lab	—	
Eyewash (5 ea.)			Lab	—	
Fire Extinguisher	12	CO ₂	Lab	—	
Fire Extinguisher	13	CO ₃	Lab	—	
Fire Extinguisher	22	DC	Walkway Lab	—	
Breathing Air Bottles		Check Press.	Walkway Control Room	—	

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