



INTER-OFFICE CORRESPONDENCE

TO: C. G. Barnes
FROM: J. E. Stevens
SUBJECT: Safety Audit
Corpus Christi Refinery

OFFICE: Houston

DATE: August 17, 1978

Attached is a final copy of the report on the subject safety audit, conducted June 13-15, 1978. This has been reviewed by Messrs. Shelton and Gay. Forwarding of the report to any further distribution you might suggest can be done under your cover letter, or I'll be glad to forward it, at your suggestion.

J. E. Stevens
J. E. Stevens

jbs
Attachment
cc: L. Shelton
J. Gay

1978
CORPUS CHRISTI
REFINERY
AUDIT

Jack Stevens

RECEIVED
AUG 1 1978

8/18/78

Joe - Leon released this as of today.

No changes from copy I sent you dated

July 7, 1978.

jbs

AN 000146

CHAMPLIN PETROLEUM COMPANY

FORT WORTH, TEXAS

LOSS CONTROL AUDIT SHEET

Location: Corpus Christi

Date: June 13, 1978

	<u>Name</u>	<u>Location</u>
Members of Audit Team:	1. J. E. Stevens	Houston
	2. Joe Gay	Fort Worth
	3. Dick Andrews	Fort Worth
	4. Bob Prince	Houston
	5. Howard Kreitz	Wilmington
	6. Chet Shockley	Enid
	7. Max Waggoner	Enid
	8. Doug Perryman	Fort Worth
	9. Leon Shelton	Corpus Christi
	10. John Dobson	Corpus Christi
	11. Jim Tansey	Corpus Christi
	12. Brack Routh	Corpus Christi
	13. August Uehlinger	Corpus Christi

champlin

INTER-OFFICE CORRESPONDENCE

GAY
ANDREWS
PERRYMAN TO: 

Leon Shelton

OFFICE: Corpus Christi

FROM: J. E. Stevens

DATE: 7/11/78

RETURN TO
SUBJECT: Loss Control Audit

SAFETY & LOSS
CONTROL DEPT.

Leon, attached is the draft report of the Loss Control Audit performed in June. As promised, this is sent only to you and Joe Gay, pending your review and return to me. When you return this copy, I will prepare the final report for submission to Cal Barnes and whomever else he may elect to distribute it to. The attachments include composited responses to the questionnaire sent out by Joe Gay. Additionally, comments as made by individuals are attached, as received. These latter actually are in the nature of inspection reports. I have placed large (red) dots alongside those I consider the most important of these items.

If you have any questions, call me at the Houston Natural Gas Building in Houston, or I can drop in at the refinery while I'm in Corpus, if you prefer. Let me know.

I'd like to be able to get the final report out no later than July 21, 1978, so please return this draft to me at your early convenience.

JES/em
Attachments (7) 

cc: Mr. Joe Gay

RECEIVED

JUL 19 1978

SAFETY & LOSS
CONTROL DEPT.

AN 000148



INTER-OFFICE CORRESPONDENCE

DRAFT

TO: Leon Shelton

OFFICE: Houston

FROM: J. E. Stevens

DATE:

SUBJECT: LOSS CONTROL AUDIT
CORPUS CHRISTI REFINERY
June 13 - 15, 1978

At the request of Messrs. Cal Barnes and Joe Gay, a Loss Control Audit of the Corpus Christi Refinery and its off-sites was conducted by eight visiting Champlin employees, accompanied and assisted by five resident employees, and aided by numerous others of your refinery staff. Names of those participating are in the attachment.

The audit was performed in two working days at the refinery, both in field and in office. Excellent cooperation was experienced with all refinery personnel contacted; the appreciation of the visitors was expressed to you in our final meeting on June 15 in your conference room.

Any hazards considered to have immediate risk for the refinery or its personnel were reported at once; none were extremely serious. However, in the brief time of the audit, some problem areas of concern were detected, as follows:

1. The group found there to be a lack of awareness and understanding as to where responsibility for safety lies.
2. Risk of accidents in the old plant areas is increased by crowding of units, heavy road traffic, excessive vehicular parking, and poor housekeeping. The newer plant areas have a few spots where housekeeping is less than satisfactory.
3. Inspection programs are not evident (or, if they exist, implementation appears to be questionable) for utility hoses, specialty hoses, respirators and their systems and some fire protection and safety equipment.
4. There is evidently a need for a coatings program for external metal protection, especially in the older areas of the refinery.
5. There were some unconfirmed "suggestions" that welding and hot tapping procedures were being violated at times.
6. (This item came to our attention only as final reports were being assembled.) The use of plant air for breathing purposes was noted. As Joe Gay pointed out in his memo to me, breathing air must meet the requirements of Compressed Gas Association Commodity Specification G-7.1-1066, and compressor temperature and CO alarms or testing are required. However, no safeguard can be assured when breathing air

AN 000149

Memo To: Leon Shelton
Re: Loss Control Audit
Corpus Christi Refinery
June 13 - 15, 1978

6. cont'd.

is cross connected to plant air, as the size and complexity of most plant air systems and their hose connections lead to contamination, in my experience by nitrogen, naphtha, butanol, etc.

The Audit Group as a whole felt that this refinery was too large to cover in a two-day period. Future safety audits would be improved, we believe, by implementing the following:

- a. Increase the number of days for the audit from two to four and a half or five days, more completely to cover the refinery.
- b. Decrease the number of visiting auditors from eight to about five, to reduce the confusion of having too many persons in at one time.
- c. Arrange for as many as eight persons (hourly and supervisory) to be interviewed by each visitor, to increase the personal contact ratio, thus to probe more fully into the safety attitudes and sense of awareness of refinery personnel to hazards in their operations.

If there are any questions regarding the audit on this report, please feel free to ask me.

jme

cc: Messrs. Barnes
Gay



INTER-OFFICE CORRESPONDENCE

TO: Jack Stevens

FORT WORTH, TEXAS

FROM: Joe F. Gay and H. R. Andrews

DATE: June 22, 1978

SUBJECT: Corpus Christi Refinery Safety Audit
June 13, 14, 15, 1978

NEW PLANT

1. Utility Station needs permanent identification.
2. Electrical pigtail adapters should be kept out of unit and treated with hot work permis.
3. Electric flex conduit broken on light above portable building by Merox Caustic Treating PS64 107.
4. Leaking pump at neutralizer sump is eating up conduit to motor.
5. Line for acid at unloading spot north side has been overheated. (What happened?)
6. Caustic leak on bottom of motor valve loop drain valves crows foot connection?
7. Tower skirts should not be used for storage and trash.
8. Need radioactive sign at Sulfur Analyzer Building beside the door so that sign will be visible when door is open.
9. Considerable oil inside tank farm, behind new control room.
10. Electrical switchgear room has storage of flammable materials.
11. Ground wires on pumps 53P-3B are missing.
Fire around C Panel by 41-PM-10A. Is conduit and wiring OK?

BOILER PLANT NO. 1

1. Housekeeping behind panel board is not up to par.
2. Excessive burner noise.
3. Vibration on piping to burner on No. 4 boiler.
4. Scaffold boards not tied down.
5. Fire Pump No. 32 nipple on case to bleed air off case corroded badly.
6. Battery dry on fire pump #32.

AN 000151

BOILER PLANT NO. 1 (Continued)

7. Fire pump #29 has improper RPM setting. Should be reset to proper setting for full pumping capacity.
8. Discharge line from #29 fire pump extremely hot. Would indicate that no water was being pumped even though pump was running.

CAT

1. Clean up behind control board in control room. Open mercury bottle, lighter fluid, etc.
2. Need rag can (additional), paste board box was being used to store greasy rags.
3. Need "Food Only" sign on ice box.
4. Need load limit posted on hoist above FP-1A.
5. Water on walkways from cooling water being applied to pump. (Temporary hook up)
6. Ladder on GV I Interstage receiver needs to be extended to ground.
7. Globe missing on light above GR-GX9.
8. Relief valves needed on simplex pumps (old interstage receiver bottoms) PP-1 & 1A.
9. Clark Compressor building needs clean up. (Hose on floor, cans - fire extinguisher on floor, etc.)
10. Fire blanket blocked by barrels on south end of compressor building.
11. Hand rail missing on platform main column OH cooler.
12. Fire extinguishers sitting by caustic treater. One is in bad shape.
13. Wire used to support piping between caustic treaters.
14. Tubular sight glass on knock out drum for off gas should be replaced with armored sight glass.
15. Railing missing on platform west end of fin fans east of cat fin fans.
16. Utility drops need permanent identification.
17. Head knocker above walkway over piping southeast corner of CO boiler.
18. Block valves beneath relief valves on 40 lb. exhaust steam line to Deaerator need chained and locked.
19. Water on deck at fuel oil system.
20. Drain pipe across sidewalk near fuel oil system should be moved (tripping hazard).

Jack Stevens
June 22, 1978
Page Three

21. Need butt cans in Smoking Pen.
22. Sloppy area around tanks for hot oil storage.
23. Do mixers have vibration shutdown?
24. Flame arrester about rusted off on T-610 spent caustic storage.
25. Housekeeping bad.
26. Piping from duplex pump needs bracing (T-610).
27. Does copper equipment around H_2S need epoxy coating?
28. Blowdown area is really a housekeeping problem (boiling out of ground, hoses on ground etc.)
29. Connection to pressure gauge on float chamber too small. (Condensate drum GR-CV7-40).
30. Piping too small on takeoff on OH vapor line between fin fan and tower #Debutanizer Stabilizer Column GR-5.
31. Need fireproofing replaced on support legs for depropanizer bottoms cooler.
32. No toe board on platform above cooling tower graver filters.
33. Need H_2S sign on road side of sour water charge drum PU-PU15.
34. Fireproofing needs repair several area.
35. Need safety shower around barrels of slimicide loaded southwest corner cooling tower or move barrels next to shower on opposite side of chemical building.
36. Some monorails in bad shape.
37. Corrosion problem on fire line in OH pipe rack southeast corner of cooling tower.

TANK FARM

1. Leaking relief valve on butane dock line 173 near pumps in pipe rack.
2. Pipe supports for foam line to Tank 1029 needs repair.

ALKY UNIT

1. Nitrogen bottle should be secured (by temperature switch box 83-TXB-1).
2. Need reel for air hose to acid suit and hose test program for these hoses.
3. Excessive vibration to small piping and sight glass on acid sample pot.

Jack Stevens
June 22, 1978
Page Four

ALKY UNIT (Continued)

4. Need means of chaining compressed gas bottles.
5. Hose left out in walking areas.
6. Grating cover missing off drain.
7. Needs clean up in heater area. Brooms, cans, fittings, etc.
8. Mark utility stations.
9. No training of operators in use of resusitators.

NO. 1 CRUDE

1. Not pressurized control room with horn.
2. Should mark refrigerator "Food Only."
3. Does first aid kit have inspection schedule (no tag to indicate)?
4. Housekeeping in control room very good even with painting going on.
5. Hose strung out on east side of control room.
6. Wiring on east side of control room should be removed if not in use.
7. Pump house - garbage can overflowing, oil on floor.
8. Lab - Hydrochloric acid stored under bench (no safety shower).
9. Need relief valves on simplex and duplex pumps in pump room.
10. Empty fire extinguisher on ground should be refilled and placed in proper position.
11. Wood support under rafter should be replaced with metal (pump house).
12. Grating on south end of pump room left open.
13. Ammonia storage cylinders should be chained off.
14. There was an open drum by stabilizer bottoms cooler. No one knew contents.
15. The safety shower in chemical house does not operate.
16. Electric does not conform in chem house.
17. LB cover on electric conduit missing by cooling tower sump pump.
18. Abandoned 4" pipe above sump should be removed.

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Jack Stevens
June 22, 1978
Page Five

NO. 1 CRUDE (Continued)

19. Step and extension ladders in need of repair.
20. Need guards on fin fan shaft.
21. Utility stations need permanent marking.
22. Hose across walkway by E-41 cooler.
23. Seal missing on extinguisher and inspection tag missing (may be discharged) by E-41 cooler.
24. Fireproofing needs repair or replaced.
25. Some pipe supports need fireproofing.
26. Piping across walkway (low bridge) by U-2.
27. Cover left off drain by #2 fractionator heater and around entire heater area.
28. Mercury switch open on back of control board exposing to shock hazards.
29. Electrical junction box on west side control room badly rusted out.

PLANT GENERAL - COMMENTS

1. One flat bed truck was seen carrying several people on bed with feet hanging over sides.
One "cherry picker" was seen with swamper riding directly over right front wheel with feet hanging over the front end.
Riding on vehicles without proper places designated should be prohibited.
2. Smoking restrictions are not being rigidly enforced.
A number of cigarette butts were observed in areas not designated as smoking areas. Specifically they were noted in front of the new control room, along with several streets and behind the board in the new control room.
3. Vehicle traffic within the plant appears excessive. Management is aware of this problem and is working towards its elimination.
4. Use of firewater for other than firefighting should be restricted as much as possible. Many taps to the fire system were noted where maintenance and/or operations were using firewater. While this practice is not expressly prohibited by NFPA Code, the code does discourage it, as does our Corporate Safety and Loss Control Department and insurance representatives.

Jack Stevens
June 22, 1978
Page Six

PLANT GENERAL - COMMENTS (Continued)

5. Several portable ladders throughout the plant were out of place and/or had some discrepancy. Many were scattered around through the units. Some single sections of extension ladders were noted. It is recommended that specific ladder storage be designated in each unit and a more rigid inspection program be implemented.
6. Some fire equipment was not being properly maintained. Many hand extinguishers were out of place, had seals broken and needed paint. At least two extinguishers had been discharged. It is recommended that a rigid inspection program be implemented to insure the availability of this equipment. The equipment should be inspected at least monthly and the person making the inspection should initial the aluminum tag that is currently attached to each extinguisher. The maintenance and recharge dates must also be recorded on this tag along with the initials or signature of the person who performs this service.
7. Some electrical switchgear rooms were being used for the storage of flammable materials. Heavy fire loading such as cardboard boxes, filter material, etc. should be prohibited.
8. Many drums (full and empty) were noted in the units of the old plant. Some obviously had been there for quite some time and operators were not aware of their contents. It is recommended that unnecessary drums be removed and where possible drums be stored outside the unit where they are not as likely to be involved in a fire.
9. Many operations people appeared confused about the issuance of Hot Work Permits in their areas. It is recommended that this procedure be reviewed with all operations personnel at the earliest possible date.
10. Utility drops (steam, air, nitrogen, fuel gas) were not marked by a standard method. It is recommended that engraved plastic tags attached by stainless steel tie wire be used to identify each drop. Additionally, management should consider the use of a "Cleco" type fitting for breathing air drops and breathing air hoses in lieu of the crows foot connections.
11. External corrosion was noted in several areas. Special attention should be paid to those areas where cooling tower overspray and hydrogen sulfide are present.

Jack Stevens
June 22, 1978
Page Seven

PLANT GENERAL - COMMENTS (Continued)

12. Use of plant air for breathing purposes was noted. Plant air must meet certain specifications if it is used for breathing air. Specifically oil lubricated compressor must have high temperature or CO alarm. If only a high temperature alarm is used, air from the compressor must be frequently tested for CO. Air must meet at least the requirements of the specification for Grade D breathing air as outlined in Compressed Gas Association Commodity Specification G-7.1-1966.

Joe F. Gay and H. R. Andrews
Joe F. Gay and H. R. Andrews

JFG/od

Enc.

IN-HOUSE INSPECTION PROGRAM

1. Plant level Safety Program:

- A. Safety men on full time basis? Yes. Number? Three.
Safety Manager Industrial Nurse
Two Safety Engineers
- B. Method of Safety Personnel Selection -
Employment agency or personal reference and knowledge.
- C. Is there a written scheduled inspection program?
Yes.
- D. Are written reports prepared? Yes. Distribution?
Plant Manager and
Department Managers
- E. Plant Management supervision and follow-up -
Work orders written by recorder and priorities assigned.
- F. To whom does chief Safety Engineer report?
Plant Manager
- G. Liaison with Corporate Director of Safety & Loss Control -
Yes, via phone and personal visits.
- H. Major Areas of Responsibility other than:
 - 1. Fire Protection
 - 2. Safety
 - 3. Equipment Inspection
 - 4. Medical Program
 - 5. Industrial Health and Hygiene
 - 6. Workman's Compensation



INTER-OFFICE CORRESPONDENCE

To: Jack Stevens

Office:

From: Chet Shockley

Subject: Safety & Loss Control Audit

Date: 20 June 1978

PLANT INSPECTION
CORPUS CHRISTI REFINERY
JUNE 13-15, 1978

GENERAL SUMMARY

OLD AREA - F.C.C. UNIT & CRUDE UNIT

1. FIRE PROTECTION EQUIPMENT -- The dry chemical portable fire extinguishers should be inspected on location once a month. Steamer connection on fire hydrant located by 1012 Tk, 1013 Tk, 1014 Tk was half buried into ground level. Maintenance personnel were abusing 1 1/2" fire hose. Fire hose should not be used as maintenance utility and wash hose.
2. CONTRACTOR PERSONNEL -- Contractor personnel were observed breaking safety rules. This has a tendency to make Champlin employees feel they can do as the contractor employees do.
3. HAZARDOUS MATERIAL -- Chlorine containers being used at cooling towers are not well identified. Helper at F.C.C. Unit did not know if a safety data sheet for chlorine was available to him.
4. ELECTRICAL -- An explosion proof electrical plug was connected to a short extension cord ending in a general purpose female receptacle at the old F.C.C. Unit. The chlorinator was plugged into the female receptacle.

Some electrical transformers were leaking insulating liquids. A program should be undertaken to determine if these liquids contain Polychlorinated Biphenyls (PCB's). The rules and regulations of the Environmental Protection Agency subchapter R-Toxic Substances Control Act describes the regulations governing this substance. Old conduit with wires protruding should be removed if no longer in service.

- a. Housekeeping in these areas range from fair to poor.
- b. There appears to be a lack of communications and a training problem from the written safety rules and procedures down to first line foremen and hourly roll personnel.

Chet Shockley
Chester Shockley



AN 000159



INTER-OFFICE CORRESPONDENCE

TO: Jack Stevens

OFFICE: Houston

FROM: Howard Kreitz

DATE: June 21, 1978

SUBJECT: Corpus Christi Refinery Safety Audit

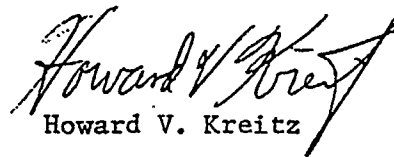
Enclosed is pages 8 through 15 of audit assigned to Jim Tansey and Howard Kreitz.

The general cooperation of on site personnel and visiting inspection team was excellent. Refinery personnel at all levels seemed to be good as to safety attitudes.

Added Observations or Suggestions:

1. At the old cat. cracker
 - a. Guard rail down at exchanger deck - 30' above grade
 - b. Suggest noise level warning sign at charge preheater (FCC-F1)
2. Hot Work Permits:

I understand Maintenance Supervisor issues on new construction -- seems there is some question about who should be involved.
3. Safety Work Requests:
 - a. Only one work request in Maintenance planning indicating good response to safety work requests.
 - b. Suggest copies of work request on safety are acted on, Safety department receive copy to develop total involvement.
4. Lock Out procedure appears not to be completely clear.

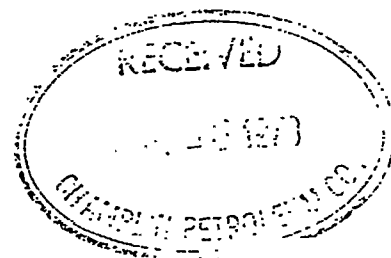

Howard V. Kreitz

HVK:cmq

cc: Jim Tansey

CPC Corpus Christi Refinery

Enclosure



AN 000160

June 15, 1978

J. E. Stevens'

Comments on Brief Tour Walking Through the Corpus Christi Refinery:

Question: Are there labels and check valves on utility drops?

Item: The No. 929 tank stairs are in deplorable condition. •

Item: The old platformer compressor building has a considerable quantity of oil in the basement.

Comment: Pipe rack line identification is not uniform.

Item: Warehouse is in generally very good condition except for the following two items:

1. Chemicals stored all in one place, nitric acid, hydrochloric acid, sulfuric acid, etc. adjacent to carbon tetrachloride which I think is almost a prohibited chemical. •
2. Pallets stacked high above metal shelving have items placed upon the pallets which could roll off while being moved. •

Chemicals Safety Manual; some sheets are undated. No sheets in this manual, or the Safety Manual, identify company or location nor in many cases date of last revision.

Question: Are there leaks in firewater lines in area around tank dikes BTX81-2-3? Much high grass is growing adjacent to fire valves, hydrants, etc.

Comment: An open roadway exists immediately past Pump Pads Nos. 2 and 2-A handling BTX products! •

Item: A deep, approximately six foot, hole has recently been dug next to Pump Pad 2-A without barriers from roadside or pump pad side.

Item: This one reported to Ray Duvall in 4:00 p.m. meeting June 14th. At the No. 1 Dock an 8" loading hose is badly kinked; metal saddles for use in hose lifting were lying on the dock unused. •

AN 000161

June 15, 1978 -- Page 2

Question: Serious questions exists on the understanding and the use of lockout - tagout work procedures for pumps, for example, not including hot work.

Item: The crude and vacuum heaters in the new units have key interlocks; two of these were on bypass with systems in operation. Penciled notation of the panelboard indicated one interlock is permanently to be left bypassed!

Comment: Cheater pigtails in electrical use in the new crude unit thwarting the purpose of the expensive and extensive explosion proof electrical installations.

Item: SPCC Plant update has not been completed since original writing in 1974.

Area of the old cat cracker

Question: Is the tubing used on chlorine cylinder installation acceptable?

Question: Should not the compressor building stairs have hand rails?

Comment: Housekeeping poor in the northeast corner of the compressor building.

Item: Ladder unsecured in recent use.

Item. Fire extinguisher CCl₂ not inspected in 1978. Location; old crude unit. Hoses unnecessarily lying across walkways.



INTER-OFFICE CORRESPONDENCE

TO: Jack Stevens

FORT WORTH, TEXAS

FROM: Doug Perryman/Max Waggoner/August Uehlinger

DATE: June 22, 1978

SUBJECT: Corpus Christi Refinery Safety Audit
June 13, 14, 15, 1978

TEL UNLOADING RACK

1. Lead car chocked on one side with a 2" x 4" board. The appropriate blue sign and metal chock were located nearby, although not properly positioned.
2. Blue sign and metal chock for railroad cars should be removed from the concrete pad at the two safety showers and eye wash.
3. A 1" x 6" wooden board is protruding out of the ground at the base of the stairway. This represents a tripping hazard.

OPERATIONS CONTROL ROOM/KNOCK LAB

1. Conclusive evidence found that employee(s) are smoking in the knock lab area.
2. Switchgear equipment doors left open and metal facing to cover circuit breakers is missing.
3. According to local management, an AFE has been proposed to provide for the installation of a Halon fire extinguishing system for the knock lab. What is the current status of this AFE? Do you plan to use Halon 1211 or 1301? Would exhaust fans (external louvers) close automatically? Who is doing the engineering work?
4. Short aluminum ladder was improperly stored. Hooks pointed away from the wall.
5. Fire extinguisher at this location is not properly identified by color background or sign. No monthly inspection noted also.
6. Red-bronze dye (antioxidant MDA) area should have appropriate caution sign as to appropriate personal protective equipment required when pumping this dye from barrels, as specified by Material(s) Safety Data Sheet.
7. Justrite self-closing rinse tank lid should be in the lower position (closed) when not in use.
8. Crows feet connections at Utility Station No. 1 not properly secured (wired).
9. Utility hoses not properly rolled up and stored in this area.

AREA - TANK 996, TANK 995

1. Handrail needed on wooden steps.

AN 000164

Jack Stevens
June 22, 1978
Page Two

AREA - TANK 996, TANK 995 (Continued)

2. The walkway on the east side of Tank 996 should have partially exposed pipe marked with yellow paint to mark this hazard. Walkway could also be built up with asphalt.
3. Scaffold erected in this area of Tank 996 and walkway on east side pipe rack does not comply with recognized federal standards. If this scaffold is no longer in use, it should be torn down and removed.
4. Poor housekeeping noted around entire area of Tank 995--ladders, oil/residue, etc.

CAT CRACKER (OLD)

1. Vertical outside lift on east side of cat cracker does not comply with current federal standards. Some of the violations are the following:

No rated capacity (pounds, passengers)

Limit switch on entry gate

Inspection program - cable/cage not posted

Back open above 4 or 5 feet which should be enclosed if this cage carries personnel only.

Barricaded area to prevent entry into bottom of lift at ground level.

NO. 1 CRUDE UNIT PUMP HOUSE

1. No. 1 crude unit pump house has poor housekeeping.

VEHICLE MAINTENANCE SHOP

1. Garage area where electric scooters are repaired and serviced has battery recharging area without vent hood. Any hot work, etc. should be restricted to an area at a distance of at least 10 feet from the battery recharging area.
2. Bench grinder tool rests should be adjusted to 1/8". Appropriate signs regarding eye protection should also be posted.
3. Parts bath has small pickup tube which would prevent lid from closing tightly. Solvent container and pump should be reviewed for possible upgrading.
4. Smoking signs posted on east side of garage should be more explicit as to where anyone can or cannot smoke.

Jack Stevens
June 22, 1978
Page Three

VEHICLE MAINTENANCE SHOP (Continued)

5. Traffic congestion noted between the garage and parking lot on east side of garage and operations building. A distinct possibility exists that traffic turning into the parking lot could hit electric scooter equipment which is suspended on ramps or pedestals and fall on mechanics. Vehicular traffic from tank farm area as well as street traffic and excess equipment on north side of parking lot make this area hazardous to anyone in the area. Congestion should be investigated thoroughly and resolved as soon as possible.
6. Battery charging area on south side of building noted without proper fume vent hood. Also, according to one comment, "This department has averaged at least one battery exploding per week." Local safety department has been notified of this condition.

NO. 1 PUMP HOUSE

1. Pipe blocking walkway to No. 1 pump house. This should be removed.
2. CO₂ extinguisher T-7 has the horn (nozzle missing).
3. According to local supervision, the UV detection equipment at the No. 1 pump house has not been checked or inspected to their knowledge. Has a maintenance and inspection program been established for UV equipment?
4. The old pump house office (now gasket storage) has a fire blanket case which is empty.
5. The concrete steps on the north side of the old lead building has an unmarked four foot drop off from where the steps stop and ground level. The concrete retaining wall does have two poor steps (rock) protruding out. This is a physical hazard which should either be torn out completely or properly constructed. Temporarily, these steps should be roped or barricaded off to prevent anyone from using the steps. This has been called to the attention of the refinery safety department.

NO. 1 DOCK

1. No inspection tag on extinguisher D-1.
2. Web slings do not have proper identification and inspection requirements according to OSHA sling regulations.
3. Utility hoses with crows feet connections do not have clips or wire to secure these connections.
4. Fire hose valve adjacent to entrance of dock from ramp is leaking and hose is partially charged. Removal of fire hose would be difficult.

Jack Stevens
June 22, 1978
Page Four

NO. 3 DOCK

1. Fire hose reel adjacent to entry ramp should be lubricated thoroughly.

WEST TANK FARM

1. The Scott Air Pak TF-2 has 1,300 psi on the bottle gauge. Consideration should be given to recharging to 2,000 psi. According to plant personnel, once bottle pressure is at or below 1,000 psi, they are replaced with 2,000 psi bottle. It is recommended that any cylinder below 2,000 psi should be recharged. Face piece should be stored in plastic bag.
2. Housekeeping around crude manifold charge pump area should be improved. Water hose, tools and fire extinguisher left at job site instead of the original storage area.

AREA 91 TANK FARM

1. Fire extinguishers have no inspection tags.

CONDENSATE LOADING RACK

1. Ground wire on condensate loading rack is disconnected. By disconnecting these wires, pump will start without tank truck being properly grounded. While loading the condensate transport, a young child was in the truck cab.

PRODUCT TERMINAL RACK

1. The product terminal loading rack extinguisher TR-1 has no monthly inspection tag and rags are laying on it.
2. The Scott fire blanket container is empty at product terminal.
3. Assistant Terminal Manager was observed outside of the terminal office without hard hat and safety glasses.

NEW WAREHOUSE

1. Refrigerant bottles in the new instrument shop should be properly chained.
2. Appropriate clips or wire should be used on all utility hoses in the new warehouse.
3. Oxygen cylinders should be chained securely in the new welding shop and instrument shop.
4. Debris is blocking access to the CO₂ extinguisher TR-6 on the south side of the new electric shop.
5. All appropriate bench/pedestal grinders other than lathe tool bit sharpener should have tool rests adjusted to 1/8" from rock or wire grinder.
6. Also, tongue guards should be installed.

AN 000167

Jack Stevens
June 22, 1978
Page Five

NEW WAREHOUSE (Continued)

7. Suggest management consider ventilation system to remove welding fumes from the new shop building.
8. The extension ladder adjacent to fire extinguisher TR-14 should be tied off if still in use. If work has been completed, ladder should be removed and properly stored.
9. Broken race on 6 foot ladder be replaced in new welding shop.
10. Rated load capacity should be posted on all swivel hoists in machine shop.

NEW UNIT

1. New crude unit should consider posting vehicle clearance signs on south side of unit.
2. Specific boundaries should be established and designated to indicate the extent of the smoking area at new unit control room. Smoking pens should have "butt barrels" to deposit smoking material.
3. Employee observed smoking inside new unit main control room. This was reported to shift foreman.
4. Twelve foot ladder on the south side of 32-E-20A in new crude unit has broken rung and bent race which should be repaired.
5. Algae buildup due to steam leak should be thoroughly cleaned and leak repaired on the south side of vessel 32-E-17 Dryer-Naphtha Dryer-Reboiler.

SULFUR RECOVERY UNIT

1. The fresh air breathing trailer on the west side of the sulfur recovery unit should have all masks thoroughly cleaned and stored in weather proof plastic cases.
2. Temporary electrical panel board for additional power requirements does not have complete explosion-proof equipment. Panel was noted north of Comfort Station No. 20 along west side of roadway.

LP GAS LOADING RACK

1. A sign should be posted at LP gas loading rack with the following information:
Chock blocks required
Ground must be hooked to transport truck before pump will operate
Any additional loading instructions.

Jack Stevens
June 22, 1978
Page Six

NO. 2 PUMP HOUSE

1. Guard should be installed over coupling (No. 6 pump) inside No. 2 pump house.

NO. 1 CRUDE UNIT

1. The air coolers on the southwest side of No. 1 Crude Unit should have guards installed over couplings.

NO. 4 TERMINAL GAUGERS OFFICE

1. Evidence of smoking at No. 4 Terminal Gaugers Office found in ash tray. This is not a designated smoking area. Also, Presto Broiler-Oven on cardboard on top of remote tank gauging equipment. Also, recommend "No Smoking" sign be posted on the outside of this single entry door. Corrective action has been taken.

BTX UNIT

1. Storage shed for BTX unit should have air bottles properly secured. Poor housekeeping noted at this location also.
2. Roadway along the east side of Tank 53, several unmarked excavations were seen which should be properly roped or barricaded off for day and night traffic. Poor housekeeping also noted along both sides of this street.
3. An appropriate warning sign "This equipment starts automatically" on fill pumps to products terminal should be posted.

REFINERY WIDE

1. Inspection and proper maintenance of all portable work platforms and ladders be initiated or reemphasized throughout the refinery.
2. Suggest that an appropriate sign be posted on all vehicles as to the passenger and load limit on all vehicles (scooters, winch trucks, drotts, go-devils, etc.).

VEHICLES

1. Appropriate triangular "Slow Moving" signs should be posted on JLG's and tractors if ever used on public streets.
2. Two of the three company winch trucks should have expanded metal guards over the rear window to protect personnel inside cab should winch line snap.

Jack Stevens
June 22, 1978
Page Seven

VEHICLES (Continued)

3. The dead man switch on one JLG machine was blocked up in down position by a board. This should be removed and specific instructions be issued regarding this matter. Electrician Ramon Dryer was observed operating this vehicle.

OTHER AREAS AND OBSERVATIONS

1. The old resid loading rack should have bottom stairway blocked or barricaded off as walkways are in bad shape. This facility has been out of service for quite sometime. Removal should be considered.
2. Tank 603, approximately 1,000 bbl. tank for blowdown from flare does not have a dike around it.
3. A Browning Ferris Vacuum truck was observed parked on an incline on west side of Tank 2004 with suction hose attached unattended, without chock blocks and not grounded. This was reported to appropriate plant management.
4. Contractor employee (swamper) was observed on top of Tank 212 without safety belt during the application of primer coating.
5. Union president, Mr. M. E. Wilson, was observed walking into the old Cat Cracker Unit without a hard hat.
6. Contract Guards were observed wearing tennis shoes. This is expressly prohibited by plant policy.

Doug Perryman Max Waggoner/DG August Uehlinger/DG
Doug Perryman/Max Waggoner/August Uehlinger

DP/od

24-27

Electronic Data Processing Machine (EDPM) Information

Not covered due to lack of time.



INTER-OFFICE CORRESPONDENCE

GAY
ANDREWS
PERRYMAN

TO: Mr. J. Stevens

FROM: R. N. Prince

OFFICE: Houston

DATE: June 19, 1978

SUBJECT: CORPUS CHRISTI REFINERY SAFETY AND LOSS CONTROL AUDIT JUNE 13-15, 1978.

SAFETY & LOSS
CONTROL DEPT.

Attached is a detailed list of safety and loss prevention related mechanical, operating, and design deficiencies found during the Corpus Christi Safety Audit.

In general, the overall appearance and condition of the plant and the personnel attitude was good. A spot check of instrumentation within the plant did not indicate any problem areas and few were found to be in bad order. There are several areas of concern; however, described below:

1. Towers and vessels in the older section of the plant have scattered failure to meet standards of height without offsets. Ladder guards are up consistently throughout the refinery, and are not installed in the older sections including the new revamps.
2. Work clean-up after shutdown and minor repairs needs to be improved as scaffolding and minor materials have been left.
3. The lockout procedure requires only the repairing party to place his lock on equipment. Only verbal authorization is required from operations, rather than operation locks and lockout boards.

Mr. J. H. Dobson is receiving a copy of these notes and will edit these for any mistakes.

Robert N. Prince

RNP/tls

cc: Messrs: J. H. Dobson
✓J. F. Gay

RECEIVED
JUN 22 1978
SAFETY & LOSS
CONTROL DEPT.

AN 000172

CORPUS CHRISTI REFINERY INSPECTION FIELD NOTES:

No. 3 Platformer - Udex

1. Raffinate sample bottle in corner of control room.
2. Control room is pressurized.
3. Shovels, tools, bottles, and other materials are piled on floor behind control room and blocks one access door.
- \ 4. Pressure seal should be installed at North end control rooms around new instrument tubing.
5. Junction box for thermocouple wire is open behind control panel. Modification work should be completed.
- \ 6. Battery lights for emergency lighting is not present. Plant uses spare emergency power generators which are field checked once per week.
7. Electrical pigtail on desk immediately next to pH solution. This is a potential spill-shocking hazard in control room.
8. Chain down on N₂ cylinder rack full of bottles. Cylinder head missing.
9. There is a water boot located on a H₂SO₄ drum. Drain on boot is a screwed valve. This is a potential corrosion hazard if moisture is prevalent or dessicant failure.
10. There is no acid collection sump or curbing around H₂SO₄ drum.
- \ 11. Acid (H₂SO₄) overfill relief is immediately adjacent to safety shower with splash hazard.
12. Maintenance work platform on H₂SO₄ tank is slanted backwards.
13. Loose hose on ground next to H₂SO₄ drum.
14. Process area is not curbed, neither is process heaters.
15. Ladder to separator drum adjacent to compressor building requires individual to step into hole prior to climbing. Back adjacent to 3/4" leaking steam valve.
16. Ladders exist to main unit pipe rack for shutdowns and instrument maintenance. There are no rack walkways and instrument maintenance is performed from ladders. There are no ladder guards.
17. Control valve loop for 40 psig letdown steam is inaccessible in piperack.
18. Bleed and drain hose on ground to a dry area from the H₂O still reflux pump.

19. Fire extinguisher inaccessible behind structure pipe station H₂O still reflux pump.
20. Ladder to high without required off-set xylene column.
21. Level assembly valving on xylene column must be operated from ladder.
22. Instrument splice junction box open in piperack. Work apparently is not complete.
23. Oil lubrication required on governor end spare reactor charge pump. Oil glass is empty.
24. Naphtha samples left open to atmosphere on wood box in main aisle of BTX unit. These have discolored with time.
25. Main piperacks are not fireproofed.
26. Scaffolding at V-1 column at two levels uses single boards - scaffolding is not tied down or wired off. Operator did not know status of work - in progress, complete, etc.
27. Hot oil sprinklers over pumps are tested during T/A.
28. No tag on fire extinguisher located at base of toluene column.
29. Oil leak and draining on ground evident from ground condition and odor at S end H₂O accumulator.
30. Personnel protection insulation may be required on channel head solvent stripper reboiler.
31. Load ratings not evident of trolley bars throughout unit.
32. Wood ladder left on platform above solvent stripper reboiler.
33. 8" hole cut into platform nest and above solvent stripper. Exchanger is located immediately above and is out-of-service. If the exchanger is removed the hole should be fixed. No toe plate is present now.
34. General trash on platforms solvent stripper.
35. Air conditioning inlet to control room adjacent to solvent stripper and fin fan.
36. Ladder guards do not exist through out the plant, including the revamp area.
37. It is not know whether lightening mixers have vibration switches.
38. Grounding not attached to new exchange.

Amine and Sulfur Unit

1. Manhole open DEA slop pit.
- \ 2. Fireproofing absent throughout entire unit.
3. Maintenance work platform left in piperack.
- \ 4. Load ratings not marked on trolleys.
5. Loose H₂S warning sign not on stand but hanging on the valves North end of unit.
6. Ladder guards left up throughout unit.
7. Ladder guards missing DEA regenerator and storage tank.
8. Slipping hazard with water and slime on pavement near sulfur storage pit.
9. Glass bottles left throughout unit.

Fuel Gas Treater

1. Chemical reagent bottle left on lower platform 43V-3.
2. Rainsuits on floor chemical lab building.
3. Bleed line piping from level float 43V-3 left out of sewer.
4. 2" piping recently installed on ground.
5. Thermocouple wire disconnected from damper operators at heater North end of LPG Merox at roadway.

Fluid Catalytic Cracking Unit

1. Turnaround platform, scaffolding, and rope remaining at flue gas cooler. Many ropes are left hanging throughout new area condition appears questionable also.
2. Broken wooden ladder near flue gas cooler.
3. Exhaust steam relief valve vent from waste heat boiler adjacent to ladder. Should be relocated or extended. Insulate for personnel protection.
4. Lube oil console for expander has a lot of oil on surface and base plate. May have lubrication loss problem.
5. Tugger has been broken from concrete. Needs to be removed. Cable storage is also poor.

6. Wooden ladder has broken rung on back.
7. Ladder laying on concrete pad.
8. FCCU feed vs slurry exchangers may require personnel protection insulation on channel head.
9. Slurry pump seal cooling water or jacket cooling water piped to concrete not to sewer. Oil on concrete.
10. Betz corrosion chemical bulk storage tank hard piping to day tank is blocking access to day tank and pump motor. Piped backwards.

MEROX - FCCU Gas Plant - UNIBON

1. Wood left on electric cable tray.
2. Caustic storage tank should be more prominently marked. Signs on tanks rather than piping.
3. Eyewash should be painted to existing standards. Sign noting it is a safety shower is broken with jagged edges.
4. Lemonade can left on fire extinguisher.
5. Valve handle left off stem pump, 21-P-2: liquid enrichment pump.
6. Man cleaning and washing down pavement with shirt open to waist.
7. Exxon chemical inhibitor uses trial bulk storage tank. 3/4" pipe is gravity feed from bulk tank to inhibitor pump running on concrete pad. May need to consider relocating inhibitor pump.
8. Rope from top platform UNIBON heater to grade.

New Crude Unit

1. N₂ cylinder not wired or chained at top. It is wired at the base.
2. Steam hose laying on pad at heater; not coiled and not on stand.
3. Wire bracing on inhibitor piping.
4. Safety shower inoperable: handle missing on pulldown, not well identified, piping on pad immediately in front of shower.
5. Chain at base of stairway vacuum tower should be tied to foundation. It could be awkward for someone carrying materials.
6. Inhibitor drum decomposed and sealed. Drum is not identified and is under pressure.

7. Scaffolding left at receiver North of electrical building.
8. Scaffolding left in piperack, not wired down, above control valve loop asphalt to storage.
9. Loose aluminum jacketing, insulation, and scaffold on DMO extractor.
10. Snuffing steam heater located too close to asphalt heater.
11. Caustic signs were not readily apparent at the spent MEROX caustic storage tank. I did not see either a safety shower or eyewash near this location.
12. Portable scaffolding installed to operate block valve East of asphalt cooler. Valve stem is located pointed down, should be rotated. If this valve needs to be operated, a permanent valve platform or chain wheel should be installed.
13. The dilute water make-up to the API trap is presently a hose connection; this should be changed to hard piping.
14. Trash drum immediately adjacent to the demineralizer area safety shower is completely full of oily rags.
15. Concrete grout failed on water pumps in the H₂O demineralizer area.
16. Damper control arrows should be located on the asphalt heater.
17. The acid fuel line to the 98% acid storage tank should be identified.
18. Contractor ladder not tied off at new boiler. Champlin man observed walking under same ladder, with a man working above, while carrying a portable wood ladder. The walking area was about 2 feet wide.
19. Caustic and acid unloading spots via tank car are adjacent. The acid fuel line has had paint burned out in about a 3 feet section. Either caustic or water has been introduced into the acid fuel heater as a reaction has taken place. Both spots have hose connected both with same fitting. The hoses should be tagged and use different fitting, if possible.
20. Small bore piping installed at the new boiler requires bracing. This pipe has sagged, contractors are using as work steps, etc.

HF Alkylation

1. Breathing air cylinder not tied off and does not have head installed at control room entrance.
2. Pipe on ground and general clean-up required in old area.
3. Ladder left on ground; should be put up.
4. Sewer rags, loose aluminum jacketing left at grade East side of unit.

5. New 2" piping installed on ground from ASO drums to lineneutralization pit. This piping runs in front of a safety shower entrance SE corner neutralization pit. Hose down at same location.
6. Head obstacle at entrance to safety shower SE corner neutralization pit.
7. Pipe support at stantion PS 83-8 holding a 3/4" line has been hit by a crane or vehicle and needs repair.
8. Platform grating at ground level at base 83v15 needs to be thrown away. This was left from construction.
9. Evidence of corrosion on depropanizer and piping, with possible acid pocket behind nipple and valve.
10. Steam hose beneath HF Alky reboiler heater on ground.
11. Need to finish personnel protection insulation work pump discharge piping East of ISO-Stripper. Aluminum jacketing left over air inlet to motor shields.
12. Air breathing hose left on ground, valving needs to be better identified. Operations only tests these hoses.
13. A safety shower may be required at the acid circulation pumps, Operator comment.
14. Rain suits behind control panel in control room.
15. Cigarettes were on floor of clean room.
16. Fireproofing should be considered on main piperack NW corner HF Alky battery limits North of the ISO-Stripper.
17. Ladder access to acid contractor area. Access to 2nd platform can be stepped through to grade. This will require complete re-work. Valve stems may also be in way from 3rd platform.

No. 1 Boiler

1. There is an extreme noise problem with no signs prevalent or protective gear evident.
2. Platform guards were not installed on top platforms of East boilers.
3. Load ratings on trolleys were not posted.
4. Ladder guard not present nor cage installed at South end East boilers.
5. Boiler house operators log data for the HYDPAR and the operational control is in the No. 3 Boiler house. If this is the only reasonable way to control this function; close attention must be maintained to convey information, and some redundant critical instrumentation may need to be considered.

6. Water plunger pump at KOH treater has a leak on the plunger fitting.
7. Wood platform (supports) in sewers rather than grating or steel plate. The wood has rot potential.
8. Eating area near chemical testing bench in control room.

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Plant Overhaul or Turnaround Practice

(General)

1. Frequency Determination - Established based on:

(1) equipment condition (2) process condition, (3) lead time for meyer equipment and catalyst (4) scheduling to avoid peak contractor demand with others (5) marketing requirements (6) raw material supply and distribution with resulting storage, and (7) financial position. Ultrasonic inspection is used for basis for unplanned shutdowns.

2. In contract labor used? If so, how employed.

Almost all T/A work is performed on contract. Contract labor is used also as swing maintenance crew. Contractor is responsible to operations for conduct. Shift foreman will spot heavy equipment. If an emergency situation occurs, each area has own alarm horn, contractor is instructed to leave the immediate area. T/A planning and scheduling establishes work requirements, job scope, and schedule.

3. Is plant safety engineer active in planning?

Only to a limited step. Job lists are prepared by operations, maintenance, inspection, and tech. service. The scope of work depends upon the critical path. Safety reviews the finish job scope and work lists, then will make written comments where necessary. Hazards are listed with handling recommendations. The safety engineer does participate in the daily T/A meeting.

4. Are operating procedures relating to shutdown and start-up reviewed before taking unit off steam?

Procedures are reviewed before each T/A blinding and equipment entry procedures are established. New installation tie-in points are identified. Operating logs are maintained for both start-ups and shutdowns and are critiqued prior to the next scheduled T/A.

5. Records and Reports on Overhaul or Turnaround Findings -

Reports are prepared on each shutdown which include identification of uncorrected potential problems to be corrected during the next T/A.

Distribution -

Plant Manager, Operating Manager, Maintenance Manager, Operating Area Superintendent, Technical Service Manager, Process Engineer, Inspection.

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Work Order Priority Covering High Hazard Equipment Repairs

1. Priority given high hazard equipment repair -

Each leak, failure etc. is analyzed by the top operator. Based upon situation at hand whether critical service, single train, or spared immediate action is taken.

2. Plant Records -

Repair logs are maintained by planning and scheduling along with T/A inspection records.

3. Authority for priority and work -

Top priority is given to any item designated a safety work order. These are immediately given to planning and scheduling each morning and work is assigned. Top operator will prepare work order and countersigned by shift foreman. Should a conflict arise regarding solution, the work order goes to next higher level of authority with those requiring a plant change, modification, or capital expenditure being reviewed by Operations Manager and Technical Service Manager.

4. Management Supervision -

Once per week the are supervisors working with maintenance planning and scheduling review the work order backlog and prioritize: work orders are signed by the top operator both on initiation and completion.

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Startup and Shutdown Procedures

1. Does plant have a formal (written) startup/shutdown for all units?

Formal procedures exist for each process unit. procedures are adjusted

for the situation at hand, i.e., whether a section is to remain pressurized, in service. Procedures are reviewed for corrections formally after each shutdown.

2. Does Plant employ the critical path (arrow diagram) method for startup/shutdown, supplemented by detail check lists?

Detailed check lists are prepared with estimated times. No determined whether critical path charts are used.

3. What arrangements are made for communications between shifts? Is there a supervision overlap?

There are verbal communication between each hourly employee and his relief both daily routine and startup/shutdowns. Detailed written logs are maintained. Not determined whether there is a supervision overlap.

4. What provisions are made for coordination between the unit and other units, power station, tank fields, pump houses, etc. on startup/shutdown.

No determined

5. Are practice or simulated startups performed before actual startup?

Not determined.

6. Does startup procedure include the following phases:

- a. Preliminary preparations - Yes
- b. Preparation of auxiliary equipment and services - Yes
- c. Elimination of Air - Yes
- d. Tightness testing - Yes
- e. Introduction of fuel gas - Yes, after steaming or purging.
- f. Elimination of water - Yes, but not detailed potential problems
i.e. reflux lines etc.
- g. Bringing unit on steam - Yes

Would recommend steam pressure testing on fin fans be eliminated if practical and possible. These should be hydrotested.

7. Shutdown procedures should include the following phases:

- a. Cooling and depressuring - Yes
- b. Pumping out - Yes
- c. Removal of residual hydrocarbons - Yes
- d. Removal of poisonous or corrosive material - Yes
- e. Disposal of water - Yes
- f. Blinding and opening - Yes. Operation turns in blind list for each vessel or piece and unit isolation blinds. Blinds are tagged both in field and permanent record board in unit. Operations has final responsibility for blinds in and out. It was not determined whether each the maintenance and operations installers sign the blind sheets. Location of blind points are not painted at the flanges in the field.

- g. Removal of pyrophoric iron sulfide - Not determined
- h. Inspection for entering - Safety performs gas checks. Permits are signed by the operator and either maintenance or safety.

8. What records are maintained of these activities?

Operations log

9. What communication equipment is available for startup and shutdown?

Radios, telephone, and shift change status reports

10. Operator Training Program

- A. Initial training - Employee is generally hired into plant pool. After initial period, employee is allowed to bid into either maintenance or operation training pool. Assigned to operating area and works through entire area. There is an establish apprentice program over a four (4) year period. Cross bidding is not allowed. Safety department does not handle employee on initial work day.
- B. Refresher training, frequency - Weekly safety training
- C. Training program records - Formal apprentice program
- D. Are procedures posted at unit - Available in book form. Emergency condition procedures are included with the operating startup/shutdown manuals. Fire call out procedures are posted.

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Utilities Reliability

1. Electrical Power -

- A. Public Utility - Corpus Christi Refinery uses 100% purchased power from Central Power and Light except for emergency for the old plant control room lighting, EDPM, lighting in the new plant, boiler control logic, aeration pumps, and some critical pumps.
 - (1) There are six feeders from CPL. The Corpus Christi area is in a tie-grid. There are two(2) 138 KV feeds and four(4) 12,500 volt feeders. There is a manual tie breaker in the old plant and an automatic tie breaker on the new plant.
 - (2) Construction of Poles - The old plant uses both cable trays and poles (wood). The new plant uses cable trays.
 - (3) Exposure to transmission lines and transformers - exposure is minimal to light traffic. Some exposure to cherry pickers on feeder that serves old API trap and #1 pump house.
 - (4) Reliability history - Old plant poor, new plant good.

B. Plant Electrical Generation

- (1) Capacity - Described above
- (2) Power source - Diesel fuel generation
- (3) Protection - Enclosed in building in new area. They are checked once per week by operations.
- (4) Exposure - Slight

C. Plant Transformers

- (1) Protection from physical damage - Yes
- (2) Exposure - Minimal

2. Steam Generation

A. Boiler capacity (pounds per hour and pressure). Are boiler permits posted.

New area: 3 boilers + waste heat generation @ 650 psig operating demand 300 M#/H, capacity 530 M#/H

Old area: #1 Boiler area (6) + CO boiler @ 250 psig operating demand 275 M#/H, capacity 395 M#/H.

B. Fuel Source

- (1) Old area - Fuel gas
- (2) New area, #1 Boiler, CO Boiler - fuel gas and fuel oil

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Water and Air Entrapment

- 1. Spot check plant practice for location drums at low points and vents at high points for process lines, vessels and equipment.

Requests 1" drains on each side of control valve loops on all new construction. New area has permanent drains old area has some temporary drains. Vents probably do not have plugs, prefer capped nipples. Did not observe in field.

- 2. Check plant program for draining water from bottom of vessels, low points of lines and exchangers during steaming and startup.

These are covered in the detailed startup check lists; however, specific startup reflux line drains in heavy oil service are not identified; i.e. vacuum units.

- 3. Plant practice for draining water from feed tanks

This is the responsibility of the Pumping and Gauging Departments, and is done once per shift. Permanent records not determined.

AN 000183

CHAMPLIN PETROLEUM COMPANY
FORT WORTH, TEXAS
LOSS CONTROL AUDIT SHEET

Location: Corpus Christi

Date: June 13, 1978

Members of Audit Team:	<u>Name</u>	<u>Location</u>
1.	J. E. Stevens	Houston
2.	Joe Gay	Fort Worth
3.	Dick Andrews	Fort Worth
4.	Bob Prince	Houston
5.	Howard Kreintz	Wilmington
6.	Chet Shockley	Enid
7.	Max Waggoner	Enid
8.	Doug Perryman	Fort Worth
9.	Leon Shelton	Corpus Christi
10.	John Dobson	Corpus Christi
11.	Jim Tansey	Corpus Christi
12.	Brack Routh	Corpus Christi
13.	August Uehlinger	Corpus Christi

ADMINISTRATION

1. General Care (Maintenance)

Paint

Very good

Warehouse Storage

Adequate

Pump Leaks

None observed

Stabilized Surfaces - Gravel - Grass - Weeds

Very good

Plant Drainage

Good

Fire Equipment

Very good

2. Cleanliness (Housekeeping)

Process Areas

Excellent (New)
Fair - Good (Old)

Control Rooms

Good (New)
Fair (Old)

Shops

Still in process of setting up after moving to new shop

Warehouses

Good - orderly

Fire Equipment Stations

Etc.

Administration - con't

3. Supervision (General Attitude)

Cooperation of Employees

Very good

Cooperation of Safety Personnel

Very good

Cooperation of Management at Closing Meeting

Excellent

4. General Remarks on interest and responsiveness to Fire Protection and Loss Prevention.

Fire training conducted annually for employees

Each area checked by inspection team at least 4 times a year

Equipment for fire protection is checked and kept in operating condition

GENERAL PLANT INFORMATION1. Type of Plant

Fully integrated Petroleum Refinery

2. Feedstock or Charge Stock -

Various domestic sweet crudes

Various foreign sweet and sour

Source

Varies

Characteristics - Physical Properties

26 to 45 gravity API

H₂S up to 500 ppm

.01 to 2 wt. % Sulfur

Shipping and Receiving Methods

Vessel and pipeline, Barges, Trucks

Throughput (Barrels per day) - Use Per Day

Average 150,000 BPD

3. List major production units -

160 M Bbl. Crude Units (2 units)

60 M Bbl. Vacuum Units

15 M Bbl. Demex

50 M Bbl. Unibon

25 M Bbl. Platformer (Motor)

6.2 M Bbl. Platformer (Motor)

45 M Bbl. FCCU

12 M Bbl. FCCU

15 M Bbl. Alkylation

Sulfur Recovery Unit 150 tons

Steam 350 MPPH

General Plant Information - con't4. Plant layout (General comments) -

Office should be outside to eliminate traffic and unauthorized personnel and for safety of office personnel.

Spacing

New plant and Alkylate Units excellent

Old units fair

Old C. U. poor

Office location very poor. Control room location old CU & FCCU, BTX are poor locations.

Utilities unexposed?

No, all types electrical and process water overhead. Firewater unexposed and main unexposed.

Flood Exposure -

No heavy rain exposure. No flood exposure except docks and portion of waste treatment (Hurricane)

Outside exposure or adjacent plant exposure

Border with Southwestern Refinery

Access under emergency conditions

a. Two gates East side; b. One South side; c. 4 gates from Lawrence and d. Four side access and water access (fireboat available).

Security (fencing, lighting, guards, etc.)

Probably OK in normal times; should be improved if radical encounters increase.

5. Fireproofing -Process vessels

Yes

Pipeway supports

Some

General Plant Information - con't

6. Flammable liquid pumps

Protection

New, yes

Old, no

Exposure

Inherent

7. Cooling Towers

Protection

Some (where needed)

Exposure

No, except old FCCU borderline

8. Water Pollution

Location of Plant with reference to waterways, marshlands, natural or man-made drainage facilities:

Exposed to ship channel

If exposed to water pollution, comment on:

A. Distance from plant to waterway

Immediately adjacent

B. Dike Capacity

Adequate

C. Spill Prevention/Containment Plan

Yes, but need annual update

Valving

A. Pipelines pass beneath waterway

6" crude line across ship channel, valved both sides

B. Fill & Unloading Lines

None

General Plant Information - con't

9. Principal Products Produced

Gasoline 3 grades

Jet A Fuel

#2 Fuel

#6 Fuel

Asphalt

Sulfur

Cyclohexane

Toluene

Xylenes, mixed

Propane

How shipped from plant

Vessel, barge, pipeline, truck, rail

Shipping containers

No drums

10. Business Interruption Potential

Feedstock and Source

Vulnerable foreign and all tankers. Crude only. P.L. not vulnerable
but low volume 28 M BPD

Single Train Operation

No

Critical Process Equipment (Identify bottlenecks)

New CU	1 wk. furnaces	#3 Platformer	1 wk. Recycle - spare
New FCCU	1 wk. blower - spare		
Alky	3 days		

Interdependency with other company operations

Nothing critical

General Plant Information - con'tStorage Facilities - con'tc. Drainage

Poor, in some tank diked areas

d. Weed Control

Yes - recent rains probably made it look doubtful at time of inspection

e. Exposure

Depending on wind conditions

f. Pollution Exposure (make specific comments on exposure to waterways, marshlands, natural or man-made drainage facilities, etc.)

The only potential exposure would involve flooding by bay waters via the ship channel. Elevation of most storage facilities is sufficient to preclude flooding except under excessive storm conditions. The ballast tank, sulfur barge-loading tank, oil sludge holding pits are most vulnerable.

g. Visual Inspection conducted on all tanks annually?

Yes - all are visually inspected quarterly by inspection team.

Comment on use and condition of shunts installed on floating roof tanks.

Inspected at least once every 6 months to 1 year depending on the service.

PLANT MAINTENANCE PRACTICES

General Observations

1. Are dikes and drains well maintained?

The dikes are in fair condition. There is some erosion, but there are no holes through dikes. They are grass covered and require constant mowing.

A. Are dike drains normally kept closed?

Yes.

B. Is there a regular inspection program?

No - drains are normally closed. For repairs, Terminal Department Operators write work orders for maintenance repairs.

2. Plant practice on hydrocarbon valve lubrication -

A. Is there a set program? (Emphasis to be made on remote, little used, valves.)

No, rely on work requests from operators.

B. Responsibility for the above -

Should be an operations function. If beyond their capabilities, Operations should initiate maintenance work order.

3. Fireproofing

A. General Condition -

Generally very good condition. The exception is older units (such as #1 Crude) in which fireproofing could be improved. Recent repair to Old FCC and Hydrar fireproofing improved situation in these units.

B. Responsibility -

Safety & Inspection groups should monitor status and initiate requests.

4. Plant drainage system -

A. Does it appear effective -

Yes.

Fireproofing - con't

B. Indications of back-up or stoppages.

Recent heavy rains have caused some problem at effluent skimmer ponds.

CONTROL HOUSES

1. Basic design -
Window size (relative) and type of glass-or-block house no window type -

There are various design control rooms at the C. C. Refinery - New control room is block house without windows. Older units have standard window sizes, of plain glass.

2. Location (with regard to exposures) -

New control room, #4 Platformer, and New Alky control rooms are removed from exposure. #1 Crude, Old FCC, BTX/Udex are located in high exposure area.

3. Is control house pressurized - or - are all ignition sources properly protected (explosion-proof electrical service, etc.). If control house is pressurized, does air come from safe source?

~~#1 Crude and Old FCC Control room are not pressurized.~~ #4 Platformer unit is pressurized but unit is not functioning due to elevated vent sucks abnoxious fumes from neighboring Southwestern refinery's Alky unit. BTX, Alky and New Control room are properly pressurized from a safe source.

4. Are pneumatic or electric signals used in control rooms? (Flammable or toxic fluids or vapors must not be piped into control rooms for instrumentation.)

~~Both pneumatic and electric signals are used depending on which unit. #1 Crude does have fluid piped into control room.~~

5. Are instrument tubing bundles, instrument ducts and conduit equipment with vapor seals and vents to prevent process vapors from entering control rooms and instrument cases?

~~Yes, with the exception of #1 Crude and BTX control room.~~

6. Is Electronic Data Process control used in connection with any plant processes? If so, how is data process control equipment protected?

Yes, in New Control room - Data Processing equipment room is part of Control room. Control room is a pressurized block house and a good location with regard to exposure.

Control Houses - con't

7. Do instrument audible alarms in critical instrument loops sound loud enough and long enough to insure being heard? (Examples listed below).

A. Low pressure in instrument air, cooling water, or fuel gas systems.

Yes

B. High liquid levels - in fuel gas, compressor suction, relief valve, or blowdown knockout drums.

Yes

C. Failure of control room ventilation in pressurized control rooms.

No, they are not alarmed, except in some new units.

D. Other system failures affecting safe and continuous operation.

Yes, such as temperatures, pressures, and vibrations.

INSTRUMENT INSPECTION PROCEDURES

1. Plant inspection and repair facilities -

Instrument facilities are adequate for Electronic and Pneumatic instrument repairs. New shop facilities are well equipped.

2. Inspection program -

Most instrument work initiated by operators by work order system. Operators man equipment 24 hours a day, and when they are aware of equipment malfunctions write a maintenance work order for repairs. There are routine checks required for EPA for opacity meters, H_2S and SO_2 .

3. Inspection frequency of pressure vessel gages (how tested) -

~~We do not regularly test pressure vessel gages. There is normally a redundancy of pressure devices around a pressure vessel (including safety relief valves.)~~ Pressure gages are calibrated and repaired when requested by Operations via the Maintenance Work Order system.

4. Program records -

None on pressure gages. Meters as required by EPA.

5. Program responsibility -

Operations and Maintenance

6. Management supervision -

Instrument supervisors and above for quality of work.

7. Does instrument failure cause controlled equipment to automatically remain in position - open, close, start, stop, or do whatever has been predetermined as necessary to assure fail-safe unit operation.

The equipment is installed as per Engineering design.

METALS INSPECTION PROGRAM1. Scope of program -

All piping, pressure vessels, exchangers, fired heaters, storage tanks is in the scope of the metals inspection program. ~~The program is to control corrosion and to predict service life.~~ Old records are being updated.

2. Tanks, pipe, and vessels inspected -

Yes

3. Instruments used -

Visual sight, ultrasonic inspection for non-destructive thickness measurement, Ultra-violet for temperature, hammer testing, hardness testers, fiber optics, cameras, X-ray, and metalurgical etching and microscopic equipment.

4. Inspection frequency - 5 years or less?

~~Setting up program to inspect all equipment every 5 years or less.~~

5. Deficiency correction procedures -

Formal written recommendations to management and maintenance work order system.

6. Plant records -

Yes - setting up files by equipment.

7. Management supervision -

Inspection supervisor reports to the Technical Manager.

8. On stream inspections made by Inspection section -

Yes - Scheduled for critical area. According to Inspection supervisor every unit will be inspected once a year.

9. Vessels, pipe and tanks - instrument inspected - separate record of each.

Yes - Not all pipes have separate record as this would not be feasible. Spools of piping inspected are filed.

Metals Inspection Program - con't10. Use of pilot or telltale holes -

This is not a recommended practice. Non-destructive testing is industry practice.

11. Retirement Thickness Determination

Yes - All equipment is recalculated.

A. Action taken -

Replacement when recommended.

12. Welder Qualification Procedure & Use of Qualified Welders

All welders used in refinery are qualified and all procedures are qualified.

13. Use of outside services for welding inspection & quality control

Yes - Use of various companies.

RELIEF VALVE INSPECTION PROGRAM

1. Inspection frequency - Maximum interval 5 years -

Relief valves on boilers are only valves that are reliably scheduled. Normally during turnarounds all relief valves are tested. Inspection is developing a methodical schedule to eliminate the possibility of not checking a valve every five years.

2. Type of tests conducted -

Disassembled, cleaned, and bench tested.

3. Are block valves installed below relief valves -

Few

Are they normally sealed in an open position -

Not all but will be

Block valves below relief valves sealed with car seal -

Yes, some chain and padlock, yes, some.

4. Use of rupture disks under relief valves.

No

5. Program records -

Records have historically been kept in the machine shop. New refinery records are good - older units are not complete. Inspection is building files, when complete, ~~Inspection will maintain relief valve records~~

6. Deficiency correction procedures -

When relief valves are repaired, they are tagged by state approved relief valve repairman.

7. Implementation responsibility -

Inspectors.

PLANT PROCESS EQUIPMENT INSPECTION RECORDS

1. What records are maintained - (Those relating to property loss control not already covered under Instrument, Metals, and Relief Valves)

Vibration readings and signatures for major rotating machinery, records of corrosion probes, Engineering files of equipment drawings, machinery history records, and others.

2. Availability to plant personnel -

Yes

3. Record distribution -

Maintenance engineering and production.

4. Record protection -

Maintenance files are in maintenance shops. Engineering files are in fireproof vaults in main office.

5. Deficiency correction -

Work order system.

6. Emergency shutdown logic -

Testing frequency -

Shutdown.

Records -

Instrument and machine shops.

PLANT OVERHAUL OR TURNAROUND PRACTICE(General)1. Frequency Determination - Established based on:

(1) equipment condition, (2) process condition, (3) lead time for major equipment and catalyst, (4) scheduling to avoid peak contractor demand with others, (5) marketing requirements, (6) material supply and distribution with resulting storage, and (7) financial position. Ultrasonic inspection is used for basis for unplanned shutdowns.

2. Is contract labor used? If so, how employed?

Almost all T/A work is performed on contract. Contract labor is used also as swing maintenance crew. Contractor is responsible to operations for conduct. Shift foreman will spot heavy equipment. If an emergency situation occurs, each area has own alarm horn, contractor is instructed to leave the immediate area. T/A planning and scheduling establishes work requirements, job scope, and schedule.

3. Is plant safety engineer active in planning?

Only to a limited extent. Job lists are prepared by operations, maintenance, inspection, and technical service. The scope of work depends upon the critical path. Safety reviews the finished job scope and work lists, then will make written comments where necessary. Hazards are listed with handling recommendations. The safety engineer does participate in the daily T/A meeting.

4. Are operating procedures relating to shutdown and start-up reviewed before taking unit off stream?

Procedures are reviewed before each T/A blinding and equipment entry procedures are established. New installation tie-in points are identified. Operating logs are maintained for both start-ups and shut-downs and are critiqued prior to the next scheduled T/A.

5. Records and Reports on Overhaul or Turnaround Findings -

Reports are prepared on each shutdown which include identification of incorrected potential problems to be corrected during the next T/A.

Distribution -

Plant Manager, Operating Manager, Maintenance Manager, Operating Area Superintendent, Technical Service Manager, Process Engineer, Inspection.

WORK ORDER PRIORITY COVERINGHIGH HAZARD EQUIPMENT REPAIRS1. Priority given high hazard equipment repair -

Each leak, failure etc. is analyzed by the top operator. Based upon situation at hand whether critical service, single train, or spared, immediate action is taken.

2. Plant Records -

Repair logs are maintained by planning and scheduling along with T/A inspection records.

3. Authority for priority and work -

Top priority is given to any item designated a safety work order. These are immediately given to planning and scheduling each morning and work is assigned. Top operator will prepare work order and countersigned by shift foreman. Should a conflict arise regarding solution, the work order goes to next higher level of authority with those requiring a plant change, modification, or capital expenditure being reviewed by Operations Manager and Technical Service Manager.

4. Management Supervision -

Once per week the area supervisors; working with maintenance planning and scheduling, review the work order backlog and prioritize: work orders are signed by the top operator both on initiation and completion.

HOT WORK AND ENTRY PERMITS

1. Responsibility for authorization - (written?)

Yes.

2. Plant supervision of such work -

A. Gas free responsibility - maintenance/operations

B. Elimination of exposing flammable material - maintenance/operations.

C. Supervision of Hot Tapping - Is Hot Tapping procedure written?

Yes X No

3. Plant records of permits - original - posted at job site - thrown away when job is completed (original and copies).

Copy - 1 in Control Room

Copy - 1 left in book

4. Responsibility for clearance - Supervision - maintenance & operations

Hourly roll employee can input as he sees fit.

5. Provisions for "on site" fire protection -

Maintenance provides if needed.

6. Management supervision -

Champlin Petroleum Company

PLANT CONTROL OF CONTRACTOR PERSONNEL

1. Type of pre-entry briefing given contractor (written, oral - or both).
Written - Copy of contractor's safety rules.
Oral - Talk with contract supervision.
2. Plant safety supervision of contractor personnel.
Project Engineer or other Champlin representative, according to contract work being performed.
3. Plant hazard orientation given contractor personnel.
Yes (same as 2.)
4. Program records.
Copy of contractors safety rules in bid package
5. Director responsibility for program.
Champlin management.
6. Management supervision.
Champlin Petroleum Company

STARTUP AND SHUTDOWN PROCEDURES

1. Does plant have a formal (written) startup/shutdown for all units?

Formal procedures exist for each process unit. Procedures are adjusted for the situation at hand, i.e., whether a section is to remain pressurized, in service. Procedures are reviewed for corrections formally after each shutdown.

2. Does plant employ the critical path (arrow diagram) method for startup/shutdown, supplemented by detailed check lists?

Detailed check lists are prepared with estimated times. Not determined whether critical path charts are used.

3. What arrangements are made for communications between shifts? Is there a supervision overlap?

There are verbal communications between each hourly employee and his relief both daily routine and startup/shutdowns. Detailed written logs are maintained. Not determined whether there is a supervision overlap.

4. What provisions are made for coordination between the unit and other units, power station, tank fields, pump houses, etc. on startup/shutdown?

Not determined.

5. Are practice or simulated startups performed before actual startup?

Not determined.

6. Does startup procedure include the following phases?

- a. Preliminary preparations - Yes.
- b. Preparation of auxiliary equipment and services - Yes.
- c. Elimination of Air - Yes.
- d. Tightness testing - Yes.
- e. Introduction of fuel gas - Yes, after steaming or purging.
- f. Elimination of water - Yes, but not detailed potential problems
i.e. reflux lines etc.
- g. Bringing unit on stream - Yes.

Would recommend steam pressure testing on fin fans be eliminated if practical and possible. These should be hydrotested.

7. Shutdown procedures should include the following phases.

- a. Cooling and depressuring - Yes.
- b. Pumping out - Yes.
- c. Removal of residual hydrocarbons - Yes.

- d. Removal of poisonous or corrosive material - Yes.
- e. Disposal of water - Yes.
- f. Blinding and opening - Yes. Operation turns in blind list for each vessel or piece and unit isolation blinds. Blinds are tagged both in field and permanent record board in unit. Operations has final responsibility for blinds in and out. It was not determined whether each of the maintenance and operations installers sign the blind sheets. Location of blind points are not painted at the flanges in the field.
- g. Removal of pyrophoric iron sulfide - Not determined.
- h. Inspection for entering - Safety performs gas checks. Permits are signed by the operator and either maintenance or safety.

8. What records are maintained of these activities?

Operations log.

9. What communication equipment is available for startup and shutdown?

Radios, telephone, and shift change status reports.

10. Operator Training Program.

- a. Initial training - Employee is generally hired into plant pool. After initial period, employee is allowed to bid into either maintenance or operation training pool. Assigned to operating area and works through entire area. There is an established apprentice program over a four (4) year period. Cross bidding is not allowed. Safety department does not handle employee on initial work day.
- b. Refresher training, frequency - Weekly safety training.
- c. Training program records - Formal apprentice program.
- d. Are procedures posted at unit - Available in book form. Emergency condition procedures are included with the operating startup/shutdown manuals. Fire call out procedures are posted.

UTILITIES RELIABILITY

1. Electrical Power -

- a. Public Utility - Corpus Christi Refinery uses 100% purchased power from Central Power and Light except for emergency for the old plant control room lighting, EDPM, lighting in the new plant, boiler control logic, aeration pumps, and some critical pumps.

- (1) There are six feeders from CPL. The Corpus Christi area is in a tie-grid. There are two (2) 138 KV feeds and four (4) 12,500 volt feeders. There is a manual tie breaker in the old plant and an automatic tie breaker on the new plant.
- (2) Construction of Poles- The old plant uses both cable trays and poles (wood). The new plant uses cable trays.
- (3) Exposure to transmission lines and transformers - exposure is minimal to light traffic. Some exposure to cherry pickers on feeder that serves old API trap and #1 pump house.
- (4) Reliability history - Old plant poor, new plant good.

b. Plant Electrical Generation.

- (1) Capacity - Described above.
- (2) Power source - Diesel fuel generation.
- (3) Protection - Enclosed in building in new area. They are checked once per week by operations.
- (4) Exposure - Slight.

c. Plant Transformers

- (1) Protection from physical damage - Yes.
- (2) Exposure - Minimal.

2. Steam Generation.

- a. Boiler capacity (pounds per hour and pressure). Are boiler permits posted?

New area: 3 boilers + waste heat generation @ 650 psig operating demand 300 M#/H, capacity 530 M#/H.

Old area: #1 Boiler area (6) + CO boiler @ 250 psig operating demand 275 M#/H, capacity 395 M#/H.

b. Fuel Source

- (1) Old area - fuel gas.
- (2) New area #1 Boiler, CO Boiler - fuel gas and fuel oil.

WATER AND AIR ENTRAPMENT

1. Spot check plant practice for location drains at low points and vents at high points for process lines, vessels and equipment.

Requests 1" drains on each side of control valve loops on all new construction. New area has permanent drains, old area has some temporary drains. Vents probably do not have plugs, prefer capped nipples. Did not observe in field.

2. Check plant program for draining water from bottom of vessels, low points of lines and exchangers during steaming and startup.

These are covered in the detailed startup check lists; however, specific startup reflux line drains in heavy oil service are not identified: i.e. vacuum units.

3. Plant practice for draining water from feed tanks.

This is the responsibility of the Pumping and Gauging Departments, and is done once per shift. Permanent records not determined.

ELECTRONIC DATA PROCESSING MACHINE (EDPM) INFORMATION

Not covered due to lack of time.

IN-HOUSE INSPECTION PROGRAM

1. Plant level Safety Program:

- A. Safety men on full time basis? Yes. Number? Three.
Safety Manager, Industrial Nurse and Two Safety Engineers
- B. Method of Safety Personnel Selection -
Employment agency or personal reference and knowledge.
- C. Is there a written scheduled inspection program?
Yes.
- D. Are written reports prepared? Yes.

Distribution?
Plant Manager and Department Managers
- E. Plant Management supervision and follow-up -
Work orders written by recorder and priorities assigned.
- F. To whom does chief Safety Engineer report?
Plant Manager
- G. Liaison with Corporate Director of Safety & Loss Control -
Yes, via phone and personal visits.
- H. Major Areas of Responsibility other than:
 - 1. Fire Protection
 - 2. Safety
 - 3. Equipment Inspection
 - 4. Medical Program
 - 5. Industrial Health and Hygiene
 - 6. Workman's Compensation

UNIT EMERGENCY SHUTDOWN PROCEDURE

1. Does each unit have a pre-planned emergency shutdown procedure?

Formal shutdown procedures exist for each process unit. These are written procedures included with the operating manuals. A variety of operating conditions are covered for its separate condition.

2. How are emergency shutdown procedures posted?

- A. Contained in separate section of operating manuals in new plant.
- B. Not determined in old plant.

3. Are emergency shutdown procedures rehearsed?

Not determined specifically but from general comments, no.

4. Are units equipped with Blowdown facilities?

- A. New plant -- Yes.
- B. Old plant -- Yes.

Can blowdown controls be remotely operated?

- A. New plant -- Not determined
- B. Old plant -- Not determined

5. What facilities are provided for blowdown discharge?

Flare system - Yes

Blowdown tank - Pressure vessels included in flare systems only.
No atmospheric tanks.

6. Depressuring Systems (A vapor-depressuring system designed to reduce vessel pressures to one-half the relief valve set pressures in 10-15 minutes should eliminate most vessel failure hazards during a fire).

- A. New plant -- Yes
- B. Old plant -- Not determined

Is system provided with remote control valves?

Not determined

PLANT EMERGENCY PROCEDURES

1. Is written manual available?

Yes.

Date of last review:

Six (6) months

Does it include:

Public Relations Plan With -

a. Assigned P.R. Representative

E. L. Sample and Jim Hubenak

b. Facilities for News Media

Conference room

c. Legal Support

Houston Legal Department

d. Plan for Distributing News Releases

Yes, Plant Manager releases all information

2. Mutual Aid

a. Plant participate in a mutual aid plan?

No (Terminal fire company)

b. Is inventory of equipment and supplies available and current?

Yes.

c. Call-out Procedures established?

Yes.

FIRE BRIGADE

1. Number of paid full time members: (Background and years experience)
None
2. Number of employee members -
42, part time
3. Coverage on each shift and weekends -
5 each shift
4. Liaison with:
 - A. Public fire department
Fair
 - B. Industrial fire brigades
Primary source (direct with Safety Manager)
5. Training Program (drills - frequency - records - outside help) (Drills at least annually)
1 per year.
6. Supervision
3 safety men and terminal fire company
7. Pipe, Equipment, and Adapters for public fire department -
None (use same size and thread) (1-1/2" and 2-1/2" NST)
8. Plans for additional fire fighting support (additional men, foam, fire trucks hose, etc.)

Future plans, as soon as training room constructed, fire truck garage, A & M training for potential fire brigade members; all personnel will receive.

PLANT EMPLOYEE FIRE PROTECTION TRAINING PROGRAM

1. Which employee Groups receive training -
All
2. Frequency of training - (live fire training at least every 2 years)
Each year
3. Scope of training -
Dry chemical, water hose (1-1/2") and fire truck that contains H₂O,
Drychem and AFFF.
4. Training facilities - description
New facilities under construction.
5. Records of employees training -
Yes
6. Employee Groups not receiving training - Why?
Office workers at Anchor Building
7. Who is responsible for training program -
Safety Manager
8. Are professional schools on fire protection being utilized -
Texas A & M Industrial Fire Training.

FIRE LOSS INVESTIGATION AND RELATED RECORDS

1. Describe plant fire loss investigation program -
Safety engineers, along with maintenance, terminal, operations and whoever is involved.
2. Check fire/loss reports -
Recorded
3. Investigation responsibility -
Safety Department
4. Loss report distribution -
Corporate, plant manager, insurance and other designated people.
5. Action taken on Information Gained from Investigation -
Immediately, if possible.
6. Plant management supervision -
Excellent.

FIRE PROTECTIONPrivate Outside ProtectionWater Supply:Source -

16" City water at East and West side.

Distribution System (Including sectional control) -

Through refinery

Sectional Valaves checked at least weekly -

No.

Hydrants - (type and spacing)

Mueller, American Darling and self made.

Monitor Nozzles -

Stationary monitors with nozzles.

Fire Hose -

Fire boxes at strategic locations and supply room

Tested annually -

Tested annually at 200 psig for 5 minutes. Changed every four years or sooner if needed.

Fire Pumps:

<u>Model or Type</u>	<u>Driven by</u>	<u>Rated Capacity</u>	<u>Rated Discharge-psi</u>	<u>Rated Speed</u>	<u>Manual or Automatic</u>
4-Gardner Denver Diesel	Diesel	1500 gpm	150 psi	1500 RPM	Manual
2-Detroit V-71	Diesel	2000 gpm	150 psi	1500 RPM	Auto & manual

Pump stated (at least weekly) using automatic or remote means -

Yes, pump mechanics responsible for this.

Fire Protection - Con't

Public Protection

Public Water Supply -

City main

Source -

16" line on East and West side

Volume -

40-50 psig

Distribution System and Hydrants -

None

Public Fire Department -

Paid or Volunteer -

None

Distance -

Automatic Sprinklers -

Water Supply -

Fire lines

Alarms -

None

Dry or Wet Systems -

Wet

Portions Not Sprinklered -

Yes

Age of AS Heads -

2 years

Water Spray -

Manual -

Yes

Fire Protection - Con't

First Aid Fire Appliances

Extinguishers -

514

Standpipe and Hose -

20-1-1/2"

Type -

Water, Halon, CO₂, 20# dry chemical, 30# dry chemical, 150# wheeled and 350# wheeled

Motorized Equipment -

Trucks, Trailers, etc. -

2 fire trucks; 300 gal. of water, 100 gal. of AFFF, 2-150# dry chemical chambers

2 foam trailers (ea.); 300 gals. XL-3 foam

Fire Alarm Systems -

Telephone control. Local alarm system for minor fires, follow-up call to fire company as needed.

Special Hazard Protection -

Deluge System -

Yes

Monitor Nozzles -

Yes

Carbon Dioxide -

Yes

Foam -

Yes

Fire Protection - Con't

Dry Chemical -

Yes

Halon 1301 -

Computer Building

Watchman and/or Security Guards -

Number -

17

Own Employees or Outside Agency -

Advanced Industrial Security

Area Covered -

Entire Champlin property

Patrol Frequency -

24 hour surveillance

Patrols Recorded -

2 radio equipped patrols

Radio Equipped -

5

Private Fire Brigade

(See Separate Report)

WATER TEST DATA SHEETS

Fire Pump Tests are recorded on the Water Test Data Sheets which are part of the inspection report.

Each fire pump is tested flowing close to rated discharge, preferably at the test header or from the hydrant used in previous tests.

The most recent five (5) test results are retained on the report. When a sizable change from previous tests is observed, the appropriate corrective recommendation should be made.

Where multiple fire pumps are involved, capacity flow tests should be made, concentrating on area of high value and/or greatest fire water demand.

CHAMPLIN PETROLEUM COMPANY
SAFETY AUDIT

Date: June 13, 1978

Plant Name: Corpus Christi Refinery

Location: Corpus Christi, Texas

Number of Employees: 439

Senior Management Official: Leon P. Shelton (Refinery Manager)

Nature of Business: Petroleum refining

Principal Problem Areas: (1) New hired employees (training for same - H₂S - benzene etc.)
(2) Fire training/brigade update
(3) Expansion of safety meetings; program and supervisors involvement in same.

Accident Experience:

This Year to Date

Total Reported Injuries: 40 OSHA Recorded Med. Cases: 2 L.T.I's 0

Man-hours to date: 414,229 Freq. Rate: N/A Sev. Rate: N/A SII: .96

Property Damage: -0- Down Time: -0-

Last Year

Total Reported Injuries: 67 OSHA Recorded Med. Cases: 9 L.T.I's 3

Man-hours to date: 966,078 Freq. Rate: N/A Sev. Rate: N/A SII: 1.86

Property Damage: Not known Down Time: -0-

Previous Year

Total Reported Injuries: 54 OSHA Recorded Med. Cases: 12 L.T.I's 4

Man-hours to date: 851,254 Freq. Rate: N/A Sev. Rate: N/A SII: 2.4

Property Damage: Not known Down Time: -0-

Fire & Explosion Experience:

This Year to Date

Total Reported: None Injuries: - Property Damage: -

Business Interruption Loss: -

Fire & Explosion - Con'tLast Year

Total Reported: 1 Injuries: -0- Property Damage: \$159,228

Business Interruption Loss: None

Previous Year

Total Reported: -0- Injuries: - Property Damage: -

Business Interruption loss: None

Principal Causes of Fires: (1) Pump seals and packing

A. Administrative

1. Safety Policy and Attitude

- a. Is there a written accident prevent policy? Yes
- b. Is it oriented toward injury prevention only? No
- c. Is it oriented toward accident prevention? Yes
- d. Is it oriented toward total loss control? Yes
- e. Are all supervisory personnel familiar with it? Yes
- f. Are hourly workers familiar with it? Most: (1) all older employees are,
(2) new employees need more on job training from supervisors.
- g. How does management support the policy? Nominal support
- h. General Attitude toward safety

Workers	Good
Supervisors	Good
Management	Good
- i. Do senior management meetings include safety? Yes
- j. What are the safety objectives? Total commitment without accidents
Five year plan --

A. Administrative - con't

k. Is success in accident prevention recognized?

Promotions No

Appraisals No

Other No

l. Is responsibility for safety defined in writing? Yes

Do those responsible understand? Yes (assumed)

Do all levels understand their responsibilities? Yes (assumed)

m. Is safety included in job descriptions? Not to safety department's knowledge

n. Are accidents and their costs charged against the department? Yes

o. Are first line supervisors required to submit periodic safety reports to management? Not to safety departments knowledge (monthly inspections)

2. Safety Organization

a. Is there a safety director designed for the operation? Yes

Time spent on safety? 100%

b. Other members of his staff: 2 safety engineers, 1 R.N.

c. Safety Committees

Senior management? Central Safety Committee

Supervisory? None

Other? None

d. How often do they meet? Monthly

Report to? -

Chairmen? Leon Shelton

Agenda Prepared? Yes

Are serious accidents and near miss accidents reviewed by this committee?
Yes

How effective are they? Reviewed (effectiveness unknown)

A. Administrative - con't

3. Safety Education and Training

- a. Is there a formal safety orientation program for newly hired employees?
Yes
- b. Are job methods prepared for each job? no
- c. Are JSA's prepared for each job? No Are they used in training programs? Unknown
- d. What other job training programs are there? HF acid, H₂S, explosion meters
- e. Is there a planned safety training program? Yes
Who conducts the training? Supervisors (not in all areas)
What is the nature of these programs? Safety action monitor (copy attached)
- f. Is there a training program for industrial power trucks? In planning stage.
Who attends? All I.P.T. operators
- g. How is safety publicized within the plant?
Bulletin Boards: Yes Post near misses: No
Post serious accidents? No Newsletters? No Other? Safety Meetings
- h. Have there been any special educational programs conducted within the last 12 months? Yes - CPR, First-aid, DuPont S.T.O.P. Program, salaried hourly, defensive driving - to employees and family after work hours.
- i. To what extent are the preventive and predictive aspects of safety emphasized in these programs? Preventive
- j. Safety award programs? Yes, yearly awards to all employees
- k. Are safety rules posted? No - available in control rooms and during safety meetings.
- l. Is there a safety handbook? Yes, safety manual

B. Inspection and Enforcement

1. Are regular inspections made of plant areas, facilities, building, machinery, equipment, tools and work methods for accident hazards? Yes
By Whom? Management How Frequently? Monthly and weekly
How extensively? All areas How processed? Work orders
2. Is a check list used in making inspections? Not at all times
3. Are recommendations for correction of accident hazards acted upon promptly? Work order written and processed according to priority.
4. Do supervisors report hazards and advise management of unsafe conditions beyond their control? Yes (engineering work order)
5. Is there a safety suggestion program? No How is it processed? --
6. Are local safety rules and regulations including those pertaining to the use of personal protective equipment administered in accordance with the plant's current instructions? Yes
7. Is disciplinary action taken towards supervisors who tolerate unsafe conditions or practices? Safety department not involved
8. Is disciplinary action taken toward employees who refuse to conform with the plant safety rules and regulations? Yes For failure to use protective equipment? Yes
9. Do good housekeeping conditions prevail? Hopefully
10. What special permits are enforced?
Hot work? Yes Vessel Entry? Yes Lock out? Procedure used (no permit)
Other? None

C. Statistics, Reporting and Accident Investigations

- a. Are injury statistics being kept and posted in accordance with OSHA requirements? Yes

C. Statistics - con't

- b. Is a record made of all injuries? Yes
- c. Is the cost of property damage, material loss and business interruption recorded? Yes, safety department not totally involved.
- d. What use is made of these statistics? Unknown
 Broken down into types and causes? N/A
 Analyzed and reviewed periodically? N/A
 Other? N/A
- e. Is there a standardized system for reporting accidents and emergencies?
 Yes
- f. Is there an emergency plan? Yes What does it cover? Fire, storms, blackouts, bomb threats, evacuation.
- g. Who investigates fires and accidents? Supervision reporting to central safety committee.
- h. Do supervisors prepare accident reports? Yes

D. Medical Program

- a. Pre-employment physical? Yes Other examinations? Yes
- b. Are medical and hospital services readily available? Yes
- c. Are dispensary facilities available on premises? Yes
- d. Is it open on every shift? No (night supervision has access)
- e. Is there a plant doctor or nurse on duty? Nurse Company Doctor? No
- f. Are there trained First Aid people on every shift? Yes
- g. Are environmental health hazards being monitored? Yes
 Fumes? No Dust? No Noise? Yes

E. Personal Protective Equipment

- a. What protective equipment is available to employees?
- Eye glasses? Yes
- Safety footwear? Yes
- Goggles and face shields? Yes
- Airline respirators? Yes
- Gas masks? No Respirators? Yes
- Ear muffs and plugs? Yes
- Other? Other protective equipment is provided as needed.
- b. What instrument are available to check environmental conditions?
- Combustible Gas Analyzer? Yes
- Toxic gas analyzer? Yes
- Oxygen meter? Yes
- Noise meter? Yes
- c. Who is responsible for equipment, inspection and maintenance?
- Safety department
- d. Are there maintenance sterilization facilities? Yes (respirators)

F. Engineering Controls

- a. Is the safety department notified upon requisition and installation of new equipment regarding safety in design and/or alteration of plant facilities, building and layout of machinery or facilities? Not in all cases.
- b. Are there special committees to evaluate the impact of changes in environmental conditions that might be brought about by plant alterations and/or expansions? Unknown
- c. What equipment and materials are purchased under the direction of the safety department? Fire protection, safety and medical.

F. Engineering Controls - con't

- d. Is the fault tree or any other system safety technique used for the purpose of presenting a graphic presentation of parallel or sequential events of the principal hazards? Not to safety department's knowledge.
- e. What other special accident predictive techniques are employed? None
- f. Is there an industrial engineering section (job evaluation, methods of improvement, work simplification, quality control, etc.)? No
- g. Is there a planned maintenance program in effect? Somewhat
Are priorities set for safety items? Somewhat

G. Unsafe Conditions

- a. Major structural deficiencies, exists, fire doors, etc.? No
- b. Adequate control of fumes, dust, gases, heat and noise? Yes
- c. Safety valves - Periodic inspections made of heat activating devices, automatic releasing devices, audible or visual warning systems, gas analyzers and other devices pertaining to fire and/or accident presentation? Somewhat
- d. Are ANSI Codes employed as a guide to providing safety devices and machine guards for hazardous operations? Yes, where applicable
- e. Color Coding? Yes, somewhat
- f. Specific problems noted:
 - 1. Too much vehicle traffic
 - 2. New plant fire alarm system needs debugging
 - 3. Eroding of tank fire walls (dikes)
 - 4. Foam protection on tanks needs updating
 - 5. Old transite fire line needs to be replaced
 - 6. Need adequate employee safety training facilities

H. Unsafe Work Methods

A. Specific

1. Water Treating

- a. Handling 100# soda ash and 50# lime sacks - manually
- b. Carrying same over pipes, curbs and up stairs (E.W.O. turned in)

2. Sulfur plant

- a. Rod out intake pipes to sulfur pit
- b. Standing on top of 40' structure with no platform. (E.W.O. turned in)