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INTER-OFFICE CORRESPONDENCE

TO: T. J. BRONAUGH

OFFICE: WILM. REF.

FROM: D. R. BLADEN

DATE: JULY 6, 1987

SUBJECT: SAFETY & LOSS CONTROL AUDIT - CCR 1987

Attached is a copy of my report for the Champlin Corpus Christi Refinery audit. I thank you for the invitation, and I believe lessons were learned by all involved. Should you have any questions, please advise.

DRB:dmp
2188N

attachment

cc: J. N. Doddy
[redacted]
J. R. Jeter
R. P. Pavletic

RECEIVED
JUL 10 1987
SAFETY & LOSS CONTROL DEPT.

CH/W-000205

[redacted]

CHAMPLIN REFINING COMPANY

CORPUS CHRISTI, TEXAS

SAFETY AND LOSS CONTROL AUDIT

AS CONDUCTED BY DAVID BLADEN

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PREFACE

David Bladen, Ted Meadows, and Mike Kusz visited the Champlin Corpus Christi Refinery from June 16-18, 1987. The purpose of the visit was to be part of a ten member team that conducted a safety and loss control audit of the facilities. The remaining team members were:

Tom Bronaugh (CRC-FW)
Lowell Miller (CCPC-CC)
Chet Orzechowski (CCPC-CC)
Anthony Nagy (CRC-FW)
Dannie Arrington (CCPC-CC)
Joe Gay (UPRC-FW)
Mark Hawkinson (UPRC-FW)

The visit consisted of discussions with members of the refinery staff and members of supervision. The team also toured selected areas of the refinery to identify unsafe conditions, assess the effectiveness of rules and procedures, and observed employees at work to determine how the safety efforts to date have effected the performance of their jobs. During these tours, the team members discussed safety with various supervisors and hourly employees to learn their concerns and opinions.

At a closing meeting with the refinery management on June 18th, the team reviewed their finding's, conclusions and recommendations, answered questions and discussed ideas for improving the safety performance at the refinery.

CHAMPLIN REFINING COMPANY
CORPUS CHRISTI, TEXAS

SAFETY AND LOSS CONTROL AUDIT
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SUMMARY

This was my second audit at the Corpus Christi Refinery; the first being about 5 years ago. If I was asked what would be the major change in the Refinery Safety Program since my last audit, I would have to say the attitude of the hourly employees and supervision. They feel they have a major involvement in the safety of the refinery. They indicated they wanted to work safely, follow all safety procedures and see a major reduction in near misses and work related injuries. During the discussion, most hourly employees indicated that they feel management is concerned for their welfare and safety efforts are genuine. Several employees stated they can now see management is willing to correct environmental conditions even though the corrections cost money.

Some of the current worthwhile safety activities and programs that can serve as building blocks for continued improvement towards establishing a solid safety performance are listed below.

1. Bob Loveless and other members of supervision are reorganizing the Safety Procedures manual and updating procedures.

2. Monthly safety meetings and weekly safety huddles conducted by the Maintenance Supervisors.

3. Training of Maintenance employees on new state of the art equipment.

4. Training the Operations Group on vibration monitoring, this in turn will give the operator a better feel of equipment conditions.

5. Implementing the STOP Program.

SUMMARY (cont'd)

Although I see a great enthusiasm for running a safe, efficient refinery, some elements of a sound safety program are still missing and others need to be developed so that they became part of the routine in managing the business. With a few exceptions, equipment and facilities were found to be in condition and housekeeping appeared to be adequate. Supervisor job knowledge and the way they conduct themselves is excellent. The craftsmen were equally good. The basic challenge to management is to better control the activities of personnel.

As management continues to expand the safety efforts, its members should project themselves in several directions enabling them to achieve an even better safety performance. For example:

1. Management should more fully develop the line organization as the avenue for communicating safety information and administration of programs.

2. Management must establish standards of performance for members of supervision and hold them accountable for meeting them.

3. Management should strive to create greater awareness of safety among the employees. Programs such as monthly safety meetings and weekly safety huddles are a step in the right direction. Other positive efforts would include semi-annual safety discussions by management, special training sessions, day to day contacts by supervisors, and the exercise of discipline when necessary.

SUMMARY (cont'd)

4. Management should develop a formal audit program that would involve every member of management, supervisors and the safety organization. These audits serve as a sample measurement on the level of safety performance on the plant. They also help raise the standard of safety performance by enabling supervisors to apply principles learned in the STOP Program.

5. Management should continue to improve rules and procedures and enforce them as a condition of employement.

6. Management should develop a formal program to improve injury and accident investigation efforts so that those events can be a learning experience for all employees.

7. Management should establish minimum standards of performance for craftsmen. Craftsmen should be tested to ascertain whether they are qualified to make required decisions and knowledgeable to do the work.

8. Management should develop craft training programs for those craftsmen who do not meet the minimum standards.

EVALUATION AND RECOMMENDATIONS

The remaining portion of this report summarizes my assessment of safety at the Corpus Christi Refinery. As mentioned earlier, management has already initiated numerous positive safety steps. Therefore in this section, I will concentrate on the deficiencies I recognized during the audit. Appendix A is the field notes and some of the specific items that were observed.

Develop the Line Organization to Administer Safety. Much of the knowledge about safety efforts and pertinent safety information that could benefit employees does not, in some cases, reach them because some branches of the line organization are not holding safety meetings and properly communicating the information to the employees.

An example of this would be the new HazOp Review Procedure. The Maintenance Supervisors who were to present this procedure to the hourly craftsmen as part of the June Safety Meeting had just received the procedure in the mail. They had not been instructed themselves on the procedure, nor were they given any information as to why the procedure was needed. This approach by management does not convey a feeling of importance regarding the material or papers, nor does it convince them that safety is an important aspect of running the refinery.

All members of management and supervision must become actively involved and enthusiastic about safety. Without enthusiasm there is little chance of involving the employees and motivating them to work safely. Immediate supervisors play a vital role in reducing accidents by being enthusiastic and letting personnel know what is going on thus making them feel they are a part of the team.

EVALUATION AND RECOMMENDATIONS (cont'd)

A number of Maintenance Supervisors did not have safety policy manuals; those who did, had manuals that were outdated. The only updated manual within the department available to the supervisors was in the Planning Department. Again this situation does not convince employees that safety is an important aspect. Management can easily improve the safety performance at the refinery by placing a stronger emphasis on communicating safety information down through the line organization.

It is recommended as part of the monthly safety meetings, that supervisors discuss current injury statistics, key points discussed in the management safety meetings, new safety rules and procedures or other pertinent information that the supervisors may wish to convey. One to one direct safety communication between immediate supervisors and hourly employees should be encouraged. Other pressing items such as facts relating to injuries or near misses, audit observations, and safety related changes in work activities should be discussed with employees on a priority basis during normal day to day activities.

Management should develop a system for occasionally monitoring how thorough and effective line supervisors are in communicating important information. Most craftsmen when interviewed could not tell me what was discussed during last months safety meeting.

Hold Supervisors More Accountable for Broad Aspects of Safety. Most supervisors realize they have a responsibility for safety, and clearly understand that their ability to meet the goals established by management will affect their success on the job. However, many of the deficiencies in the safety efforts at the Corpus Christi Refinery could be overcome by expecting more from supervisors.

EVALUATION AND RECOMMENDATIONS (cont'd)

During some discussions with supervisors, it became clear that not all supervisors believe that all injuries can be prevented. Therefore, they are willing to accept some injuries as a way of running the refinery. One supervisor stated that he had some employees who were "just accident prone", and there was nothing he could do to change small accidents. I believe this is an excuse, it shows that the supervisor has failed to motivate his employees, is inadequate in training personnel, and is unwilling to use disciplinary measure when all else fails.

I recommend that management establish higher standards of performance for supervisors and hold them accountable to those standards.

Management may want to consider adopting the principles stated in the attached literature, "Ten Commandments of Safety Effectiveness". This paper was prepared by the Wilmington Safety Department and is presented on the following pages. These principles should be explained to every supervisor, preferably in a one to one situation by his boss, so everyone will understand clearly what management expects of him.

Additionally it is important that management continually demonstrate its commitment to safety. It is usually better for management to go out of the way to set a good example or prove that safety is a priority. This means not only being enthusiastic and talking positively about safety but also doing such things as observing speed limits, stop signs, and demonstrating through other actions on and off the refinery, that safety is important.

TEN COMMANDMENTS OF SAFETY EFFECTIVENESS

1. As a supervisor, I have in a sense, two families. I will care for my people at work as I care for my people at home. I will make sure each of my people at home and at work understands and accepts his personal responsibility.

2. I will make special efforts to know the rules of safety that apply to the work I supervise. I never want it to be said that one of my people was injured because he/she or I did not know the precautions required on his/her job.

3. I will anticipate the risks that may arise from changes in equipment or methods. I will make use of the expert safety advice that is available to help me guard against such new hazards.

4. I will encourage my people to discuss with me the hazards of their work. I will not permit my job to proceed where a question of safety remains unanswered.

5. I will <u>teach</u> my people at work safety, as I would guide and counsel my family at home, with patience, firmness, and persistence.

6. I will follow up my instructions consistently. I will see to it that my workers make use of all safe guards provided them. If necessary, I will enforce safety rules by disciplinary action. I will not fail my company which has sanctioned the rules, or fail the workers who need them.

7. I will set a good example. I will not appear as a hypocrite in the eyes of my people if I continually demonstrate safety in my own work habits and personal conduct.

8. I will investigate and analyze every accident, however slight, that befalls any of my workers. This is the first step in preventing another accident from the same cause.

9. I will cooperate with those in my company who are actively concerned with employee safety.

10. I will remember that accident prevention not only reduces human suffering and loss, but from a very practical viewpoint, it is good business. Safety, I believe, is one of my prime obligations, not only to my company, my fellow managers and my fellow men, but most especially to me.

EVALUATION AND RECOMMENDATIONS (cont'd)

Improve Injury and Incident Investigations to Prevent Recurrence. Management should develop procedures for investigating all injuries. To some extent, the investigation should be based upon the potential seriousness of the injury. Management should also establish a monitoring technique to ensure that the investigations are thorough and meaningful; require reports of close-call incidents that could have resulted in injury if conditions had been slightly different; and provide a system for communicating lesson values from injuries and incidents to all employees.

One program Management may want to consider requires the Safety Manager to assess the nature and severity of the incident. For example:

1. Minor incidents - The investigation is by the functional supervisor and the Safety Manager. The supervisor is responsible to implement corrections, the Safety Manager is responsible to monitor corrective action.
2. Major and non-technical incidents - The Safety Manager names a committee to investigate. The committee members submit comments, reports, and recommendations to the Safety Manager. The Safety Manager issues only one report on the incident eliminating, where possible, contradictions and departmental bias. The Safety Manager is responsible to monitor corrective action.
3. Major and technical incidents - The Safety Manager notifies the Technical Manager that the Technical Manager will chair the incident investigation committee. The Safety Manager is always a member of the committee. The Technical Manager issues only one report on the incident. The Safety Manager is responsible to monitor the corrective action.

This system assures that only one official incident report is issued, that a competent chairman and committee conducted the investigation, that all relevant opinions are considered, and that departmental bias are eliminated.

EVALUATION AND RECOMMENDATIONS (cont'd)

Management can take a step toward making injury and incident investigations more meaningful in the eyes of lower levels of supervision by requiring the immediate supervisor of an injured employee or an employee involved in a "close-call" incident to come to either the Management Safety Committee meeting or a regularly scheduled staff meeting to review the incident and answer questions. The supervisor should be prepared to discuss how the incident occurred and what corrective actions will be taken to prevent recurrence. When supervisors are required to participate in such a way, they soon begin to realize that management expects high quality investigations; this approach also applies pressure to the supervisor to have good answers and explanations ready for any questions that management may ask.

Management should develop a standard method of communicating this information. One system, requires the safety organization, which usually receives all injury reports, to issue a special summary report consisting of impersonal facts, causes, corrective measures, and lessons to be learned. These reports are sent to supervisors who can then review the details with their employees. Such a system should be considered for the Corpus Christi Refinery.

Review Supervisor to Hourly Employee Ratio. It is recommended that management reassess its policy on the ratio of hourly employees to each supervisor. The Corpus Christi Maintenance Department averages around 18 to 1. In one case a supervisor has 28 full-time employees working under his direction. I do not believe I have to elaborate that these ratios are excessively high. It is recommended that the ratio should be around 10 to 1. This would give the Maintenance Supervisor the opportunity to address safety as discussed in this report and ensure each employee working under his direction follows all rules and procedures.

EVALUATION AND RECOMMENDATIONS (cont'd)

Continue to Upgrade Safety Rules and Procedures. The safety policy manual is currently being updated, efforts should be continued by all departments to provide increasingly better instructions so employees can perform their work more safely. Supervisors should develop procedures for all aspects of safety that are unique to their areas and are not covered by the plant safety manual. Numerous operations in the Maintenance Department are not covered by any type of instructions or procedures. For example, there is no procedure to explain how to maintain grinders.
Injuries have occurred because the wrong grinding wheel was placed on the grinder. Maintenance supervision should critically examine all of their activities and make sure that procedures provide employees with adequate safety instructions.

A review was made of the Work Permit procedures, "Safe Work Performance Permit", procedure # 4, and "Maintenance Safety Work Order System", procedure # 25. It is recommended that management review these policies and consider the following comments.

It is not clear from reading these two procedures which permit is required, or who has the authority to approve each permit. When the maintenance work permit is utilized, it has a one time use only. When one of the area maintenance supervisors was asked what he would do if the permit section of the work order had been used, he stated the second permit would be verbal. Obviously, situations like this cannot be tolerated. My recommendations for improving the work permit system are as follows.

1. Combine both permits into one, discontinue the maintenance permit as described in procedure # 25.
2. Rewrite procedure # 4 entitled "Safe Work Performance Permit" to include all work activities.

EVALUATION AND RECOMMENDATIONS (cont'd)

3. Separate various work activities into groups according to the degree of hazard, and assign minimum approval levels for each group.
4. Assign minimum approval levels for contractor work. This should be a higher level of approval than if a Champlin employee was doing the work.
5. Ensure that all personnel involved fully understand the work scope and permit conditions by writing them down on the permit so there is no misunderstanding. One way of doing this is for all involved to meet at the jobsite, discuss the job in detail, and have the permit made out and approved at that time.
6. Avoid open end permits. Set times for expiration depending on the job, such as shift change, change in job scope, emergency situations, change in maintenance crew, etc.
7. Fully define the responsibilities of each individual from the craftsmen, leadman, supervisor, and superintendent. Each party involved in the permit should know what is expected of him.

Equipment Inspection Program. Management should develop a program to inspect all tools and equipment that employees use to perform their regular duties. This program should include all requirements as outlined by OSHA and other governmental agencies. Employees should be made aware of what is required of them and be trained accordingly so they are qualified to make these inspections. All records of inspections should be documented and retained by the Safety Department. The following is a partial listing of items that should be covered under this program.

Autos and Pickups
Chains and Hooks
Cranes and Cables
Electric Carts
Electric Cords and GFI's
Elevators

EVALUATION AND RECOMMENDATIONS (cont'd)

Emergency Generators

Fire Pumps

Forklifts

Hoists

JLG

Ladders

Hoses

Safety Harnesses

Scaffolding

Trips and Alarms

Wire Rope/Synthetic Slings

Rental Equipment

CHAMPLIN REFINING COMPANY

CORPUS CHRISTI, TEXAS

SAFETY AND LOSS CONTROL AUDIT

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CONCLUSIONS

Management at the Corpus Christi Refinery recognizes the need for a solid safety program. However, there remain some weaknesses that must be overcome before it can be assumed with reasonable assurance that safety is being managed properly.

Management must strive to establish higher standards of conduct for supervisors and hourly employees. To do this, management must hold all members of supervision accountable for such things as setting the proper example, correcting unsafe situations, and communicating safety in an enthusiastic manner. Adequate safety rules and procedures must be provided and employees should be trained to know and understand them.

Management should require employees to adhere to existing rules and procedures and enforce this requirement by using disciplinary measure when necessary. Injury and incident investigation practices should be improved so that all employees can benefit from the information generated by the unfortunate events. Finally, it is advisable that management develop audit procedures and self-critical monitoring programs to assure the effectiveness of all safety activities.

APPENDIX A

FIELD NOTES

FIELD NOTES

The following field notes were taken during my tour at the Corpus Christi Refinery. The list is not intended to include every item or problem I encountered. Comments and suggestions were made for improvements to the members of supervision during the tours. In addition, I received many good ideas and suggestions that I can adopt at Union Pacific Resources Refinery at Wilmington.

1. It is recommended that management reassess its policy of the maintenance group performing gas testing for doing welding and entry work. It is advisable that these tests be performed by the Operations group. The Operations group is in a better position to know unit condition, changes in environment, and provide a good balance and check for the Maintenance group.

2. It is recommended that management reassess the Inspection group reporting to the Maintenance Department. The Inspection group needs an environment where it can provide unbiased feedback to management. It is advisable that the Inspection group report to the Manager of Technical Services.

3. Although the level of housekeeping in the Maintenance Shops was good, various shops had materials stock-piled on the shop floor. It is advisable that these materials be placed on racks or stored in the warehouse.

4. During the tour of the operating units, it was observed that bull plugs were missing from various process valves and fittings. It is advisable that all bull plugs be re-installed as soon as possible.

5. It is recommended that the Technical Services group review its policy of allowing threaded fitting and tubing on hot oil and high pressure service. It is advisable that all pipe and fitting be back-welded with break-out flanges and tubing eliminated where feasible.

FIELD NOTES

6. It is recommended that supervisors enforce its scaffold tag policy. Various scaffold did not have safe and operable tags attached to notify personnel it was OK to use.

7. It is recommended that management review the "Nomex" clothing policy. Various Maintenance Supervisors had shown an interest in the "Nomex" jackets worn by the Wilmington team members.

8. It is recommended that the Maintenance Department review the P.M. program to include the testing of turbine overspeed trips and routine oil changes in rotating equipment. The predictive vibration monitoring program is excellent for predicting vibration related problems. However, it is still advisable to change oil just as we would do in any automobile.

9. It is recommended that management reassess its policy on deviations from procedure. It is advisable that whenever a deviation occurs, it is documented and approved by management.

10. A tour of the Maintenance Shops and Control Room gave evidence that employees were not familiar with the MSDS program. Although employees were given training one year ago, when asked where the MSDS manual is located, very few knew where it was and no one could find the MSDS sheet they needed. It is recommended that a retraining program be initiated and the MSDS manual index be updated.

APPENDIX B

AUDIT CHECK LIST

5. What specific items are covered?

6. Is there a documented routine inspection program for remote operating pumps and other rotating machinery?

▷ P.M. Group check vibration on pumps in the tank farm each week and documentation is kept. Did not have time to find out if the operations group routinely checks these pumps.

7. Are signs posted indicating remote starting on applicable machinery? Are these signs properly located and in satisfactory condition?

▷ Very few signs were posted to indicate remote starting. This is an area that needs improvement.

8. What remote machinery is equipped with vibration sensors and shutdown fire detectors?

▷ No pumps in the tank farm were equipped with vibration or fire detection. The reliability group indicated a study was underway to determine whether to do chronic equipment.

9. Is there a documented periodic inspection of foam chambers, foam piping, and foam connections?

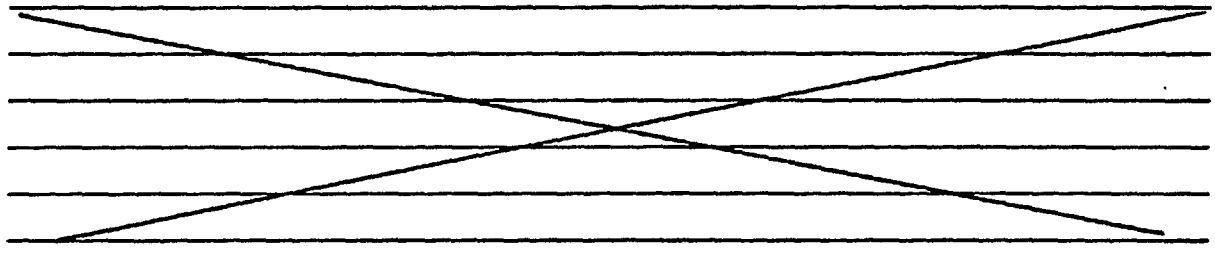
2. Do all electrical installations comply with the appropriate area classification?

▷ The majority of electrical installations do comply with the appropriate classifications. Especially in the new plant. There is an ongoing program to bring the remaining plants up to standards.

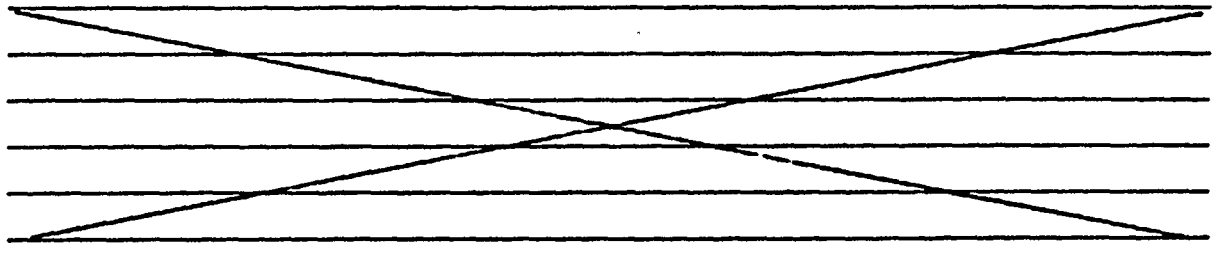
3. Are there clearly defined exits in case of emergency?

▷ In most cases.

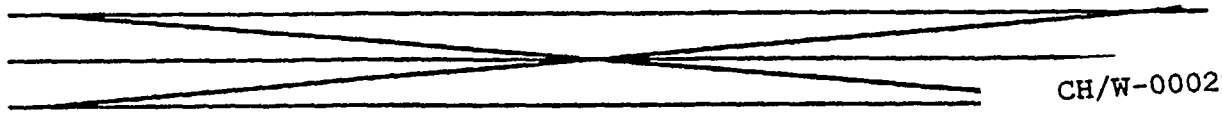
4. Are there any flammable or toxic products piped into control room?



5. Is computer in safe location free from unnecessary hazards?



6. What types of fire protection and detection have been provided for the control house and computer equipment?



7. Is there an uninterruptible power supply system capable of emergency shutdown needs in the event of the failure of the primary power supply?

▷ Yes. There are various emergency generator and UPS systems throughout the plant ranging from 50K.W. to 200K.W.

COMMENT/RECOMMENDATIONS

▷ Did not have time to review system in its entirety.

F. Instrumentation

1. Which equipment shutdown devices are checked on a definite schedule?

▷ Boiler every 6 months - All other equipment during turnaround. There is no other routine schedule other than turnarounds. Fidel Velazquez is currently developing a list of alarm and shutdown settings for all equipment, see a need for checking more often.

2. What type programs are provided to assure that records are maintained and up to date on checking and setting shutdown device?

▷ Instrument group keep manual card system of all checking and setting, transferring over to computer sytem. Yield Accounting receives some records on meters etc. Could not find any procedure for keeping records etc.

3. What type of inspection and repair facilities are available currently?

▷ Facilities are more than adequate.

a. Are they adequate for current needs? Future needs?

▷ Yes.

4. Are safety or shutdown devices on equipment operable and being utilized?

▷ An area I needed more time on. I was told the Alky Heater is in byepass may be an area to investigate.

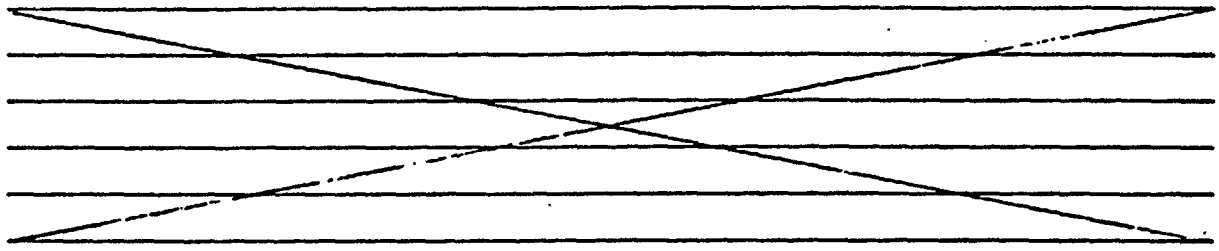
5. Are the operators aware of what the settings are for safety and shutdown devices?

▷ Operator's have manuals, but there is concern about them not knowing the settings did not have time to ask operations.

6. Is there a reliable back up system for critical instrument power? (Battery for electronic air for pneumatic).

▷ Yes see item E-7.

7. Are instrument spaces behind control panel free of debris and dirt?



8. What alarm systems acknowledge buttons or automatic shutdown devices are being defeated or by-passed at this time?

▷ Alky Heater, checked major rotating equipment all appears to be functional.

9. Are alarm functions checked periodically, or only when failure is noted?

▷ Only boilers checked every 6 months. All others during T/A.

III. PLANT MAINTENANCE PRACTICES
F. Instrumentation

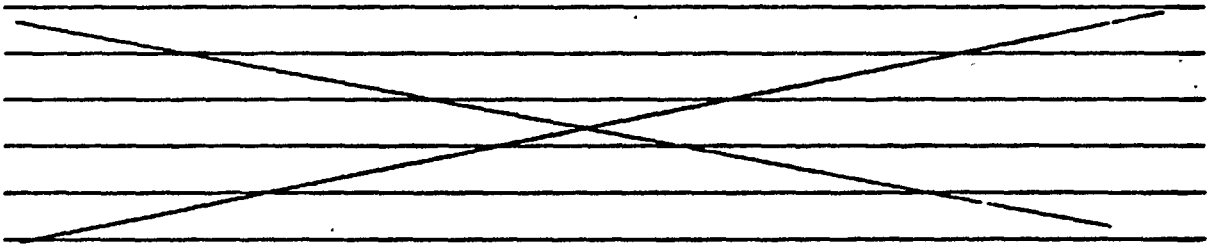
10. How often are back-up and parallel power supplied checked for proper operation?

▷ Switchgear during turnarounds. There is infra-red scanning done periodically.

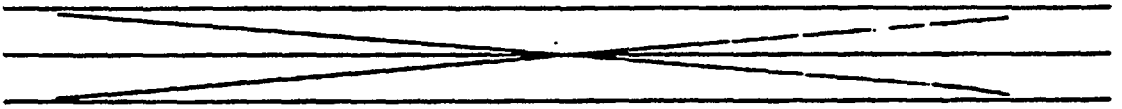
11. Does alarm system notify operator of backup failures in power supplies?

▷ Alarms at TDC and main control rooms.

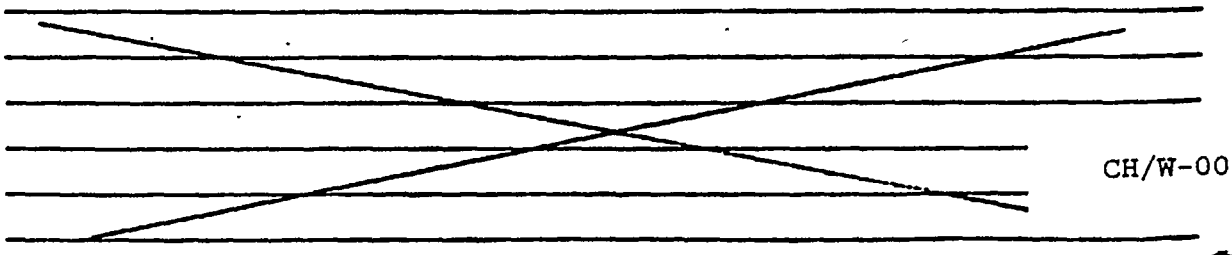
12. Are control valves stroked periodically to full open or closed to check ability to fail in proper direction during instrument air failure?



a. On what basis and by whom?



COMMENT/RECOMMENDATIONS



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G. Rotating Machinery

1. Is there an active preventive or predictive maintenance program for rotating machinery? Are the records up to date?

▷ Pretty good predictive program for checking all rotating equipment for vibration related problems, the records are up to date. No other apparent programs such as oil changes or overspeed trip of steam turbines. Needs improvement in this area.

2. Is critical rotating machinery equipped with adequate sensing devices? (Vibration, bearing temperature, axial displacement, etc.)

▷ Yes, all major equipment appears to be adequate protected

3. Is there a scheduled/documented vibration monitoring program?

▷ Yes, excellent program.

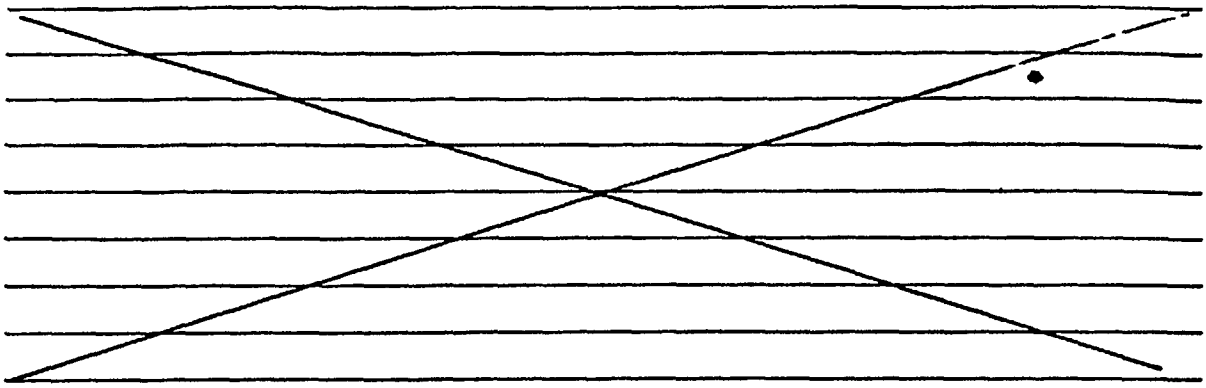
4. What type machinery history program is being utilized?

▷ RMAPS computerized sytem and some card files. Eventually all will be on computerized system.

a. For what machinery?

▷ N/A

COMMENT/RECOMMENDATIONS



H. Electrical

Is there a documented program to check important switch gear settings?

▷ Yes, Card files eventually will be putting into be RMAPS system. These checks are done during turnaround. No program to routinely check overloads, overcurrent, loss of voltage etc.

2. What type of electrical lock-out, tag out procedure is utilized?

▷ Lock out procedure appears to be adequate all crafts were installing locks along with the operation group.

a. Is it widely understood and implemented?

▷ Yes, all employees I asked stated they understood the program and was being implemented, also they felt good about it.

b. Are there any known incidents to indicate inadequacies in the program?

▷ I did not read the procedure at the time of writing this report.

3. Are substation and switch gear rooms inspected at regular intervals? Are these rooms free of debris and dirt? Are they equipped with adequate detection/protection?

▷ Electricians check on scheduled P.M. program. There are no smoke detectors, loss of pressure only 50% is A/C. There were desks in the MTBE substation.

4. Is the emergency power backup system operational?

▷ Yes, in good condition.

5. Is the battery system properly installed and provided with necessary personnel protection?

▷ No eye wash facilities, some battery systems were vented others were not.

6. Are switchgear and motor center buildings pressurized where required?

▷ Yes.

a. Are pressurized buildings provided with adequate pressure loss alarms?

Yes.

7. Is any critical high voltage equipment exposed to impact hazards that are not protected with guard post or other protection?

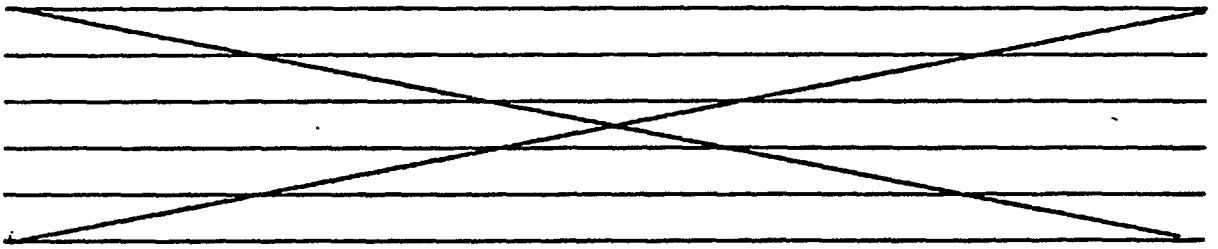
▷ Transformers at the wet gas compressor and power train do not have guard posts.

8. Is there adequate documentation of the impedance testing of the grounding grid system? Underground electrical distribution system should be inspected for flooding of manholes on a periodic basis.

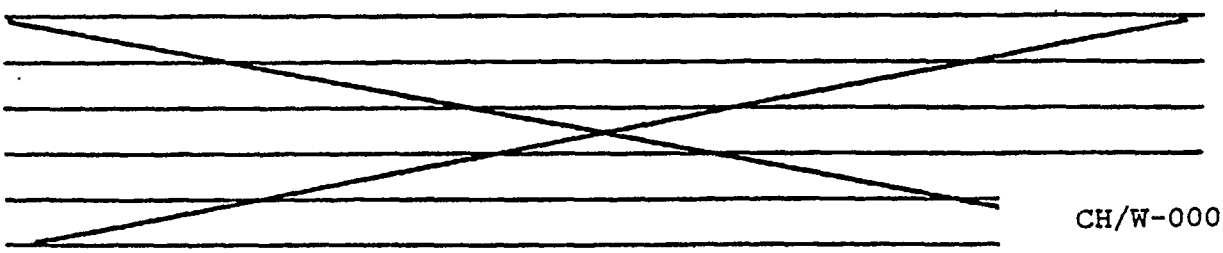
▷ TDC grounds are checked. Distribution system is not done. Electricians check the systems after a major storm.

I. Inspection

1. Are the equipment inspection files in order? Are all inspection of refinery vessels, heaters, exchangers, boilers and important piping well documented with specific follow-up procedures established?



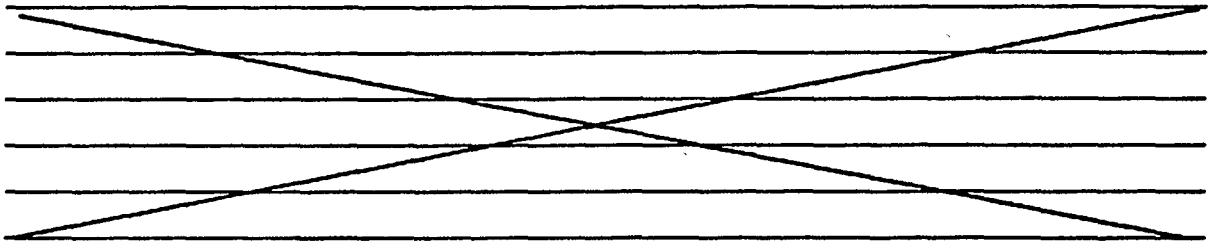
2. Is there a current onstream inspection program and does it cover all major refinery components?



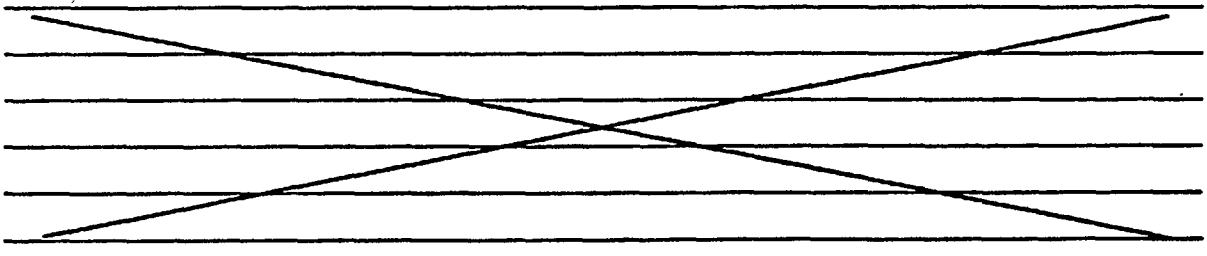
7. Is there a cathodic protection system in service? Who monitors the system? Who maintains the documentation?

▷ Yes, on tanks, firewater system and pipelines. The rectifier is checked monthly and an annual inspection is performed by outside contractors.

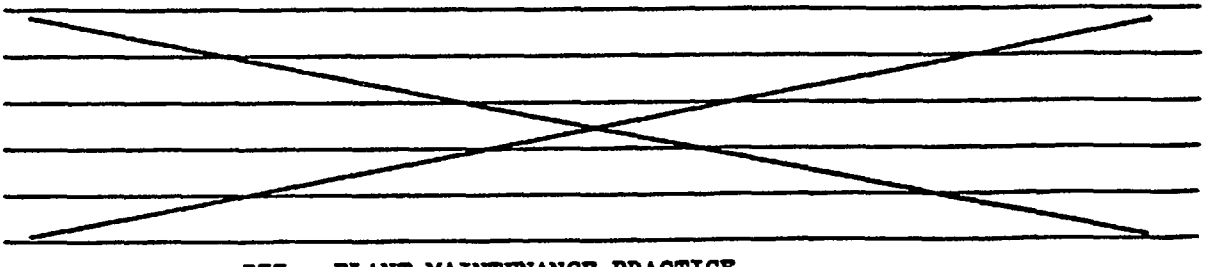
8. Are purchases of new pressure vessels reviewed by competent technical personnel? Are shop inspections performed to assure quality? Is adequate and current documentation maintained at each step of process?



9. Is material selection for new equipment reviewed by competent technical personnel?

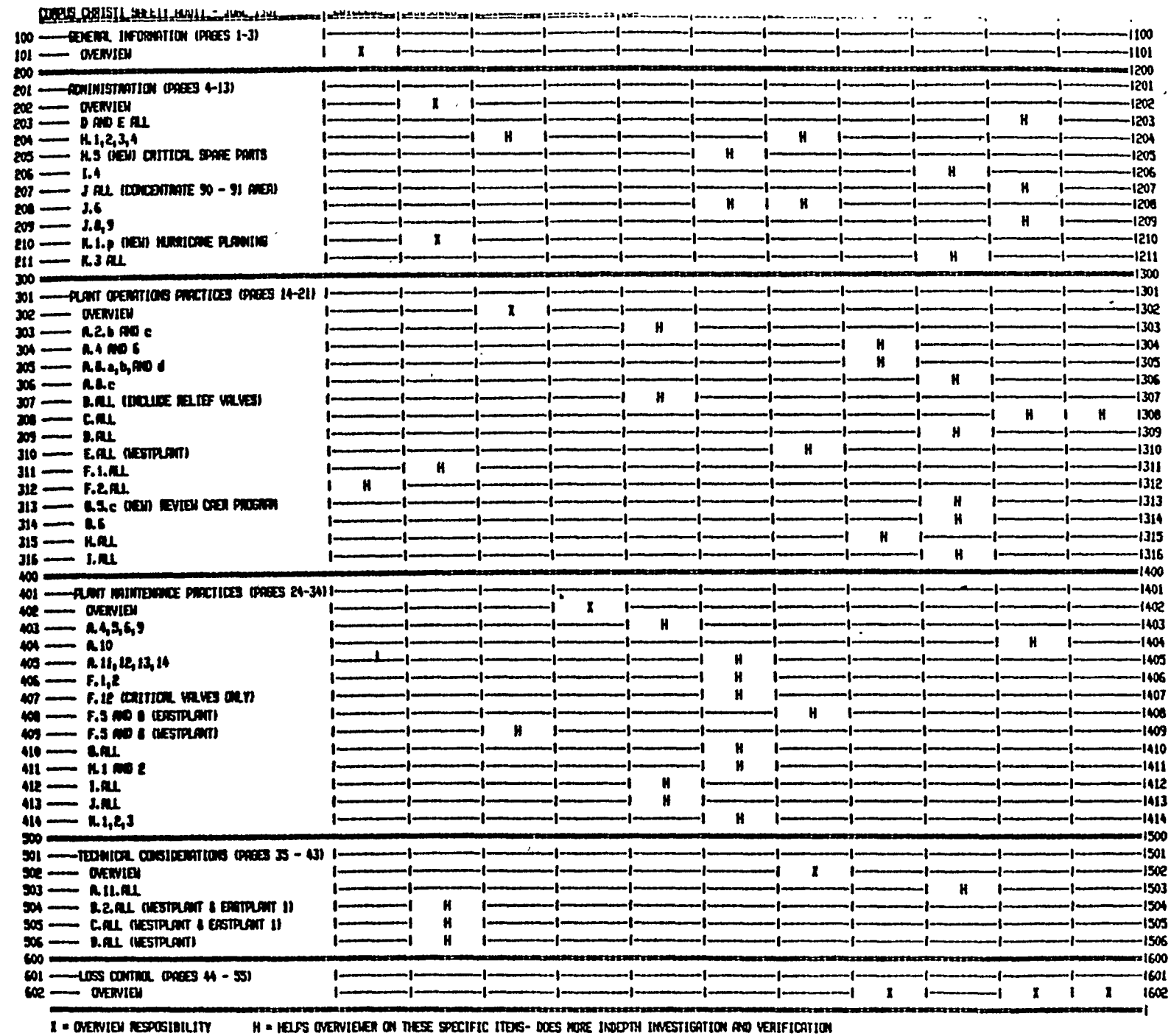


10. Are outside services used for welding inspection and/or quality control, if so, who is responsible for results?



APPENDIX C

AUDIT TEAM ASSIGNMENTS



CORPUS CHRISTI SAFETY AUDIT - JUNE 1991

100	GENERAL INFORMATION (PAGES 1-3)											100
101	OVERVIEW	X										101
200												200
201	ADMINISTRATION (PAGES 4-13)											201
202	OVERVIEW		X									202
203	D AND E ALL										H	203
204	H.1,2,3,4			H				H				204
205	H.5 (NEW) CRITICAL SPARE PARTS						H					205
206	I.4									H		206
207	J ALL (CONCENTRATE 90 - 91 AREA)										H	207
208	J.6						H	H				208
209	J.8,9										H	209
210	K.1.p (NEW) HURRICANE PLANNING		X									210
211	K.3 ALL									H		211
300												300
301	PLANT OPERATIONS PRACTICES (PAGES 14-21)											301
302	OVERVIEW			X								302
303	A.2.b AND c					H						303
304	A.4 AND 6								H			304
305	A.8.a,b,AND d								H			305
306	A.8.c									H		306
307	B.ALL (INCLUDE RELIEF VALVES)					H						307
308	C.ALL										H	H 308
309	D.ALL									H		309
310	E.ALL (WESTPLANT)							H				310
311	F.1.ALL		H									311
312	F.2.ALL	H										312
313	G.5.c (NEW) REVIEW CAER PROGRAM									H		313
314	G.6									H		314
315	H.ALL								H			315
316	I.ALL									H		316
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401	PLANT MAINTENANCE PRACTICES (PAGES 24-34)											401
402	OVERVIEW				X							402
403	A.4,5,6,9					H						403
404	A.10										H	404
405	A.11,12,13,14						H					405
406	F.1,2						H					406
407	F.12 (CRITICAL VALVES ONLY)						H					407
408	F.5 AND 8 (EASTPLANT)							H				408
409	F.5 AND 8 (WESTPLANT)			H								409
410	G.ALL						H					410
411	H.1 AND 2						H					411
412	I.ALL					H						412
413	J.ALL					H						413
414	K.1,2,3						H					414
500												500
501	TECHNICAL CONSIDERATIONS (PAGES 35 - 43)											501
502	OVERVIEW							X				502
503	A.11.ALL									H		503
504	B.2.ALL (WESTPLANT & EASTPLANT 1)		H									504
505	C.ALL (WESTPLANT & EASTPLANT 1)		H									505
506	D.ALL (WESTPLANT)		H									506
600												600
601	LOSS CONTROL (PAGES 44 - 55)											601
602	OVERVIEW								X		X	X 602

X = OVERVIEW RESPOSIBILITY H = HELPS OVERVIEWER ON THESE SPECIFIC ITEMS- DOES MORE INDEPTH INVESTIGATION AND VERIFICATION