

FINAL Audit
Recommendations

DO A 027798
CONFIDENTIAL

Solvents/EDC MOC Training Signoff Sheet

MOC TITLE: Consolidated Audit Review

DATE: 12/12/97

Mark the box next to the appropriate individual that the communication/training is intended to reach.

Engineering Staff	Master	Signature	Date
✓ Taylor, D.	434501		
✓ Haney, J.	091506	<i>James V. Haney</i>	1/29/98
Young, Barry.	433620		
Storm, C.	249497		
✓ Hunt, L.C.	088600	<i>Larry Hunt</i>	1/7/98
✓ Rolke, R.W.	097946	<i>Richard Rolke</i>	12/18/97
✓ Stallcup, J.S.	240558	<i>J.S. Stallcup</i>	12/18/97
White, W.S.	434499		

A/B Team Personnel	Master	Signature	Date
✓ Templet, T.V.	433366	<i>T.V. Templet</i>	1-7-98
✓ Chustz, G.P.	433899	<i>G.P. Chustz</i>	12-24-97
✓ Lafleur, D.J.	434384	<i>D.J. Lafleur</i>	12-24-97
✓ May, G.R.	433625	<i>G.R. May</i>	1-7-98
✓ McQuarter, J.L.	433944	<i>John McQuarter</i>	12-18-97
✓ Bruce Lewis	Bruce Lewis 225068		2/24/98

Day Personnel	Master	Signature	Date
✓ Hotard, Sr., R.J.	431516	<i>Ronnie Hotard</i>	1/7/98
✓ Miller, W.A.	431555	<i>Walter Miller</i>	1/7/98
✓ Rachal, G.W.	432421	<i>G.W. Rachal</i>	1/7/98
Brown, M.S.	433928		
✓ Butler, R.W.	433623	<i>Ralph Butler</i>	1-7-98
✓ Carville, G.M.	432419	<i>G.M. Carville</i>	12-12-97
✓ James, C.E.	432928	<i>C.E. James</i>	12/12/97
✓ Vaughn, R.P.	432882	<i>R.P. Vaughn</i>	12/12/97
Carrier, B.P.	085908		
Witt, J.	241996		
Vavasseur, T.	434160		
Landry, C.P.	434292	<i>C.P. Landry</i>	2-12-98

S	Master	Signature	Date
✓ Davis, H.S.	432619	<i>H.S. Davis</i>	1-29-98
✓ Hebert, D.M.	434243	<i>D.M. Hebert</i>	2-12-98
✓ Jones, J.T.	099295	<i>John Jones</i>	1-7-98
✓ Mayfield, H.	432761		
✓ Washington, H.J.	433555	<i>H.J. Washington</i>	12-11
✓ Young, Jr., R.R.	431633	<i>R.R. Young</i>	12/24

Site Logistics	Master	Signature	Date
Clebert, J.	432385		
Mathis, J.	432997		
Bergeron, B.	098995		
Prestonback, S.K.	433945		

C/D Team Personnel	Master	Signature	Date
✓ Arnold, B.E.	434037	<i>B.E. Arnold</i>	2-11-98
✓ Bourgeois, Jr., E.O.	431530	<i>E.O. Bourgeois</i>	12-12-97
✓ Daigle, J.L.	432627	<i>J.L. Daigle</i>	1/7/98
✓ Duck, W.C.	433122	<i>W.C. Duck</i>	12-12-97
✓ Hearn, S.A.	432873	<i>S.A. Hearn</i>	12-24-97
✓ Thibodeaux J.G.	432959	<i>J.G. Thibodeaux</i>	1-7-98
✓ Cooper, J.L.	434258	<i>J.L. Cooper</i>	2-20
✓ Jackson, A.L.	433106	<i>A.L. Jackson</i>	12-24
✓ Jackson, J.	433511	<i>Jerry Jackson</i>	12-12
✓ Landry, M.D.	241688	<i>M.D. Landry</i>	1-29-98
✓ Landry, R.W.	434061	<i>R.W. Landry</i>	1-7-98
✓ Lee, Jr., E.	432722	<i>E. Lee</i>	1-29-98

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SOLVENTS/EDC PLANT, LAO

Date of Report: 9/26/97

Superintendent: Don Taylor, Bldg., 4601 LAO

cc: Buck Bailey, Bldg. 3301W, LAO

Enclosed are the recommendations from the various audits for your response. According to the Dow U.S. Area Consolidated Audit Program Guidelines and the OSHA Process Safety Management (PSM) standard 1910.119, you must develop an implementation plan as a response to the recommendations. **The plan must include the name(s) of the employee(s) assigned to each action item along with an expected and actual completion date for each item.**

Please note that efforts have been made by the Functional Audit Teams to help prioritize each recommendation. They will be identified as: M = Must Do, (based on compliance issues, government regulations, Dow policies or S&LP) and HR = Highly Recommended, (necessary to mitigate an anticipated or potential hazard).

It is the responsibility of the plant/department supervision to communicate the results of the consolidated audit to all employees. Communication must include the results of the Process Hazard Analysis. PHA's include the Reactive Chemicals, Chemical Exposure Index (CEI), Process Safety and Loss Prevention/Fire/Burner Management audit. This must be completed within 90 days after the audit report date and documented.

Please send your approved implementation plans to Connie Kalencki, Bldg. 3502W by **November 7, 1997**. We will forward a copy to members of the Core Audit Team and the appropriate section to the Functional Team Leaders.

Enclosed Audit Recommendations:

- | | |
|---|-----------------------------------|
| 1. Process Hazard Analysis | 2. Occupational Health Audit |
| 3. Laboratory Audit | 4. Electrical Reliability Audit |
| 5. Reactive Chemical Audit | 6. Security Audit |
| 7. Loss Prevention/Fire Audit | 8. Safety Audit |
| 9. Hazardous Materials Transportation Review (not included) | 10. Process Control Network Audit |

Howard Wilkinson, Administrator
LAO Consolidated Audit Program

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LAD PROCESS HAZARD ANALYSIS (PHA's)

Recommendations:

- M 1. Communicate results of the Consolidated Audit to plant personnel within 90 days after the audit report date and document

Guidelines For Communicating Process Hazard Analysis (PHA's) To Employees

The OSHA Process Safety Management (PSM) Standard (29CFR 1910.119) requires that facilities covered by this standard perform a formal process hazard analysis, communicate the results of this analysis to plant employees whose work assignments are in the process and who may be affected by the recommendations or actions.

Currently the LAO Consolidated Audit Process include PHA's (reactive chemical reviews, hazardous materials transportation reviews, chemical exposure index audits, fire & explosive index reviews).

The following guidelines can be used to communicate the Process Hazard Analysis (PHA's) to plant employees. Communication to employees may be done in a regular scheduled safety meeting or during a safety training day and documented.

REACTIVE CHEMICAL REVIEW:

- A. Review all worst case scenarios identified by the plant and LAO Reactive Chemicals Committee. Make sure that plant personnel have a thorough knowledge of the reactive chemicals potential. Discuss the safe operating limits and consequences of deviation. Discuss the reactive chemical control systems including hardware, software and procedures. Discuss all other safeguards or action plans that are aimed at avoiding and mitigating the consequences of each scenario.
- B. Review the recommendations from the LAO Reactive Chemicals Committee and the plant action plans to correct the recommendations.
- C. Review the results of the employee interviews which are done by the LAO Reactive Chemicals Committee during the Consolidated Audit and the plant follow-up actions to address any deficiencies.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Richard Rolke	1/31/98	

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M = Must-Do

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HR = Highly Recommended

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CHEMICAL EXPOSURE INDEX REVIEW:

The Chemical Exposure Index (CEI) provides a simple method of rating the relative acute health hazard potential to people in neighboring plants or communities from possible chemical release incidents. Absolute measures of risk are very difficult to determine, but the CEI system will provide a method of ranking one hazard relative to another.

- A. Review the list of plant hazardous chemicals that were evaluated by the plant.
- B. Review the worst case scenarios and calculated CEI value. This shall include dispersion data and charts that were developed from the plant CEI review.
- C. Review all actions required to prevent the worst case. It may be a simple case of reviewing employee job responsibilities from an existing plant emergency drill. Any preventive maintenance, thickness checks, Technology Center recommendations, visual inspections and recommendations from the consolidated audit team should be reviewed also.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Richard Rolke	1/31/98	

FIRE & EXPLOSION INDEX:

The Fire & Explosion Risk Analysis System is a step-by-step objective evaluation of the realistic fire, explosion and reactivity potential of process equipment and its contents. The purpose of the F&EI system is to: 1) Quantify the expected damage of potential fire, explosion and reactivity incidents in realistic terms. 2) Identify equipment that would be likely to contribute to the creation or escalation of an incident. and 3) Communicate the F&EI risk potential to management.

- A. Review the plant F&EI process units and classified hazard levels ("heavy", "moderate" etc.). See Table 6, pg. 38 - F&EI Guide, 7th edition.
- B. Review the list of process units in your plant that were reviewed.
- C. Review the evaluation of realistic fire, explosion and reactivity potential of the process unit and its contents. (Depending on the level of hazard, certain process equipment spacing, process equipment/piping standards and loss prevention principles are applied to the process to minimize the hazard level).

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Richard Rolke	1/31/98	

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M = Must-Do

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HR = Highly Recommended

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OCCUPATIONAL HEALTH AUDIT

(Tuesday, September 2, 1997)

AUDIT TEAM: Maralee Marchant, Charles Douglas

PLANTCONTACT: Charles Douglas

WRITER: Howard Wilkinson, Maralee Marchant

GENERAL INDUSTRIAL HYGIENE/MEDICAL

The OSHA form #2203 and VPP detailing the worker's rights under OSHA were posted.

Recommendations:

None at this time.

HAZCOM PROGRAM

The written program is current. It was audited and revised in February, 1997 .

Recommendations:

None at this time.

HEARING CONSERVATION

The written program is current. Hearing protectors were readily available. The noise regulation was posted. The program was audited in February, 1997.

Recommendations:

None at this time.

RESPIRATORY PROTECTION

The written program is current. The program was audited in February, 1997.

Recommendations:

None at this time.

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M = Must-Do

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HR = Highly Recommended

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PERSONAL PROTECTIVE EQUIPMENT

The written program is current. The program was audited in February, 1997.

Recommendations:

None at this time.

ERGONOMICS

Plant personnel attended the Save-A-Back presentation. Some Office Evaluations were conducted for priority users.

Recommendations:

None at this time.

THERMAL STRESS

Recommendations:

None at this time.

VENTILATION

Hood surveys were current.

Recommendations:

None at this time.

WELDING

Health hazard and welding rod hazard signs were posted.

Recommendations:

None at this time.

ASBESTOS

Recommendations:

None at this time

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M = Must-Do

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HR = Highly Recommended

RADIATION

Recommendations:

None at this time.

LOSS PREVENTION/FIRE/BURNER MGMT./CEI REVIEW

(Tuesday, September 12, 1997)

AUDIT TEAM: Buck Bailey

ATTENDING: Richard Rolke

PLANT CONTACT: Richard Rolke, Gerald Wagener, Joe Schell, Buck Bailey

WRITER: Buck Bailey

This Consolidated Audit was conducted as a joint review including the Reactive Chemicals representatives and Loss Prevention. This is in response to the newly developed audit protocol for conducting Process Hazard Analysis reviews. It involved the use of a new questionnaire which is quite different from the previous one. We appreciate the plant's cooperation in the transition to this new format.

OPERATING DISCIPLINE

Recommendations:

- M 1. A revision of Section V of the Operating Discipline process, requires the compilation of a package of PHA information to be kept in a permanent plant file. The content is very much the same as the "Insurance Package" that is a part of the Consolidated Audit. Get with Loss Prevention for more information on the content.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Richard Rolke	10/31/97	

PROCESS HAZARD ANALYSIS/HAZOP

Recommendations:

None at this time.

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M = Must-Do

HR = Highly Recommended

CHEMICAL EXPOSURE

Recommendations:

None at this time.

PROCESS HAZARD ANALYSIS/HAZOP

Recommendations:

None at this time.

FIRE PROTECTION SYSTEMS

Recommendations:

- HR 1. The R-1D structure does not currently have any fire proofing on the structure columns. It had been decided earlier to fireproof this structure, but no schedule has been assigned. Review this project and determine when it can be done.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Jim Haney	1/31/98	

CRITICAL INSUTREMENT SYSTEMS

Recommendations:

None at this time.

PRESSURE VESSELS

Recommendations:

None at this time.

INSURANCE PACKAGE

Recommendations:

None at this time.

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M = Must-Do

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HR = Highly Recommended

REACTIVE CHEMICAL AUDIT REVIEW

(Tuesday, September 2, 1997)

AUDIT TEAM: Gerald Wagener , Buck Bailey, Joe Schell
PLANTCONTACT: Richard Rolke
ATTENDING: Buck Bailey, Joe Schell, Gerald Wagener
WRITER: Gerald Wagener

A separate sit down reactive chemical review was not done during this consolidated audit. The recent new superintendent reactive chemical review fulfilled that requirement. All concerns that were identified at the new superintendent review have been adequately addressed. The combination Reactive Chemicals/Process Hazard Analysis questionnaire was filled out by Richard Rolke and reviewed by the review team. There are no outstanding issues from the questionnaire.

During the "walk-through" inspection, a spot check of the plant's procedures and IPT modules was done. Also, random interviews of the operations personnel were done to check the deployment of reactive chemical knowledge.

Recommendations:

- M 1. The scores from the random interviews of plant employees indicate that the level of deployment of reactive chemical knowledge needs be enhanced. (The testing results are available from Joe Schell).

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Jeff Stallcup	1/31/98	

- M 2. The IPT testing for reactive chemicals which consists of 33 questions appears to be quite adequate, however, the training resource information and the IPT training module could not be located. Also, Vital Process Safety Requirements for the Solvents/EDC plant could not be located. These resources need to made available to all plant employees.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Jeff Stallcup	1/31/98	

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M = Must-Do

HR = Highly Recommended

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Craig Landry	12/31/97	

SECURITY AUDIT SUMMARY

(Tuesday, September 2, 1997)

AUDIT TEAM: Howard Wilkinson, Joe Goodwin

PLANT

CONTACT: Richard Rolke

WRITER: Joe Goodwin, Howard Wilkinson

Employees challenge strangers in their work areas. A sign-in/out log is available for visitors to the plant in the Control Room. Emergency communications and alert systems are in place and working well.

Keep up the good work.

Recommendations:

None at this time

**HAZARDOUS MATERIALS TRANSPORTATION REVIEW (HMTR) AND
DISTRIBUTION FACILITIES ASSESSMENT (DFA)**

(Tuesday, September 23, 1997)

AUDIT TEAM: Ken Kates,

PLANT CONTACT: Julie Clebert, John Mathis

WRITER: Ken Kates

Recommendations:

- M 1. Addressing DFA question #3 in regard to training on specific functions of their job responsibilities for employees handling hazardous material. All employees handling hazardous material must have "function specific" training pertaining to the job responsibilities every 3 years (49 CFR 172.704). Need to change sign-up sheet to include trainer name and location of trainer.

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M = Must-Do

HR = Highly Recommended

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Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Julie Clebert	03/31/98	

- HR 2. Addressing DFA question #4 in regard to loading/unloading written procedures. Need to include documentation that procedures are reviewed periodically. This would include name of person who reviewed and date review was completed.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Julie Clebert	03/31/98	

- HR 3. Addressing DFA question #10 in regard to having a system in place to ensure containers meet D.O.T./UN specifications for a HazMat regulated shipment. Need to add D.O.T. specification number to the checklist or procedures for tank truck shipments. (i.e. MC 307 or the proper one for the product).

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Julie Clebert	03/31/98	

- HR 4. Addressing DFA question #16 in regard to inspection of containers before loading for leaks and securement and results documented. Need to develop checklist to ensure the tank truck is in compliance before loading product.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Julie Clebert	03/31/98	

- HR 5. Addressing DFA question #21 regarding written procedures and checklist having "25 ft. Attendance" requirement during the loading/unloading process of a regulated material for tank trucks. Revise procedure and checklist to specify the "25 ft. Attendance" requirement when loading/unloading a D.O.T. regulated material.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Julie Clebert	03/31/98	

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M = Must-Do

HR = Highly Recommended

- HR 3. The type of Molecular Sieves (3A, 4A, 13X etc.) is not specified in the procedures for recharging MS-96A/B. Consider adding this information to the procedure.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Ricky Vaughn	12/31/97	

SAFETY AUDIT

(Tuesday, September 2, 1997)

AUDIT TEAM: Howard Wilkinson, Roddey Peebles, Carl James

PLANT

CONTACT: Carl James

WRITERS: Howard Wilkinson, Roddey Peebles

SAFETY QUESTIONNAIRE

- A. Program Structure and Planning**
No Recommendation
- B. Employee Participation**
No Recommendation
- C. Contractor Safety**
No Recommendation
- D. Accident/Incident Investigation and Reporting**
No Recommendation
- E. Audits**
No Recommendation
- F. Safe Work Practices**
No Recommendation
- G. Emergency Planning and Means of Egress**
No Recommendation

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- H. Employee Training**
No Recommendation
- I. Safe Operation of Motor Vehicles and Motorized Handling Equipment**
No Recommendation
- J. Off-The-Job Safety**
No Recommendation

DOCUMENTATION REVIEW

Recommendations:

Pre-start-up audits are documented with attendance. Good closure on PSM piping follow-up documentation.

All items from the documentation review were completed by the OSHA VPP Audit Team as part of our OSHA VPP re-certification.

FIELD AUDIT INSPECTIONS

The field audit inspections were completed by the OSHA VPP Audit Team in April as part of our VPP re-certification.

Recommendations:

None at this time.

LABORATORY AUDIT

(Tuesday, September 2, 1997)

AUDIT TEAM: Howard Wilkinson

PLANT CONTACT: Richard Rolke

WRITER: Howard Wilkinson

All action items from the previous audit have been completed.

Recommendations:

- HR 1. Mercury thermometer use in lab. We highly recommend using gauge thermometers where possible. If you chose to continue the use of mercury thermometers a clean-up kit is required to clean up mercury in the event one break.

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M = Must-Do

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HR = Highly Recommended

- HR 6. Addressing DFA question #27 in regard to having checklist and procedure specify the "attendance" requirement for loading/unloading a rail car. Revise procedure and checklist to specify the "attendance" requirement when loading/unloading a D.O.T. regulated material.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Julie Clebert	03/31/98	

ELECTRICAL RELIABILITY AUDIT SUMMARY
(August 19, 1997)

AUDIT TEAM: Charlie Emonet

PLANT CONTACT: Jimmy Jumonville, Steve Barlow

WRITER: Charlie Emonet

The electrical reliability audit for Solvents/EDC was conducted on August 19, 1997 as per the Five Point Electrical Reliability Program.

Recommendations:

- M 1. Posted Safety-Electrical-One-Line Diagram in MCC 2C is not current. Labeling and SEOLD does not agree on feeders L14 - L81.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Glen Rachal	01/31/98	

- M 2. Electrical room doors: Install warning and exit signs or exit lights per OSHA 1910.38 (Q) in MCC 2, MCC 3, MCC 5&6, EDC - MCC and River Water MCC.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Glen Rachal	01/31/98	

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M = Must-Do

HR = Highly Recommended

- M 3. Properly labeling of transformers and motors per S&LP S-214 in T2A, T4, T6, K40B.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Glen Rachal	01/31/98	

- M 4. Install Smoke and or fire detection system per LPP - 356for River Water MCC.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Glen Rachal	01/31/98	

- HR 5. Paint the following equipment: L-14, L-83 Switch Operator, T-2, MCC 3A, MCC 3c, MCC 3D, MP 36J, P 13E.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Glen Rachal	01/31/98	

- HR 6. Repair oil leaks on the following equipment: T2B

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Glen Rachal	01/31/98	

- HR 7. Replace or repair switch operator on L 14 & L83.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Glen Rachal	01/31/98	

- HR 8. Add nitrogen pad to T 2C.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Glen Rachal	01/31/98	

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HR = Highly Recommended

HR 9. Add second ground to T 1A.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Glen Rachal	01/31/98	

HR 10. Seal opening in building for River Water MCC.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Glen Rachal	01/31/98	

HR 11. Properly ground the following motors: P510B, P58A, P13F, P52B, P500A.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Glen Rachal	01/31/98	

HR 12. Repair conduit to P500A.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>

HR 13. Repair lights in MCC 2 and EDC MCC.

Action Taken/To Be Taken:

<i>Responsibility</i>	<i>Expected Completion Date</i>	<i>Actual Completion Date</i>
Glen Rachal	01/31/98	

PROCESS CONTROL NETWORK AUDIT
(September 2, 1997)

AUDIT TEAM: Steve Villarubia

PLANT CONTACT: Richard Rolke

WRITER: Steve Villarubia

Recommendations: None at this time

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HR = Highly Recommended

Rolke, Richard (RW)

Fr m: Wagener, Gerald
Sent: Tuesday, September 16, 1997 4:40 PM
T : Rolke, Richard (RW); Wilkinson Sr, Howard (HR)
Cc: Schell Jr, Joseph G; Bailey, Buck; Wagener, Gerald
Subject: Solvents/EDC 1 Consolidated Audit - Reactive Chemicals
Sensitivity: Confidential

Solvents/EDC Consolidated Audit
Reactive Chemicals
Review team: Gerald Wagener, Joe Schell, Buck Bailey

A separate sit down reactive chemical review was not done during this consolidated audit. The recent new superintendent reactive chemical review fulfilled that requirement. All concerns that were identified at the new superintendent review have been adequately addressed. The combination Reactive Chemicals/Process Hazard Analysis questionnaire was filled out by Richard Rolke and reviewed by the review team. There are no outstanding issues from the questionnaire.

During the "walk-through" inspection, a spot check of the plant's procedures and IPT modules was done. Also, random interviews of the operations personnel were done to check the deployment of reactive chemical knowledge.

Recommendations:

1. (MUST DO) The scores from the random interviews of plant employees indicate that the level of deployment of reactive chemical knowledge needs be enhanced. (The testing results are available from Joe Schell).
2. (MUST DO) The IPT testing for reactive chemicals which consists of 33 questions appears to be quite adequate, however, the training resource information and the IPT training module could not be located. Also, Vital Process Safety Requirements for the Solvents/EDC plant could not be located. These resources need to be made available to all plant employees.
3. (HIGHLY RECOMMENDED) The type of Molecular Sieves (3A, 4A, 13X etc.) is not specified in the procedures for recharging MS-96A/B. Consider adding this information to the procedure.

S Ivents Production Personnel Reactive Chemical Interview Questi ns

1. If a lubricant is necessary to use on a piece of equipment, instrument, or valve component that is in a chlorine containing process stream, what lubricant should be used?

Fluorolube, a non-hydrocarbon containing lubricant.

Correct
OS SOS
2/2 2/2

2. What is the reactive chemical concern regarding why Vinyl 2 acid is not taken in the Per/Tet plant?

Vinyl 2 acid contains acetylene (a hydrocarbon) that will react with chlorine.

Correct
OS SOS
1/2 0/2

3. Why is D-42B rinsed out after burning oil?

Hydrocarbons, such as oil, react violently with chlorine. The flushing of D-42B is done to eliminate the risk of chlorine containing feed being introduced into D-42B that would mix with oil left in the tank causing a reactive chemical incident.

Correct
OS SOS
2/2 2/2

4. Why should C-510 be shutdown upon high temperature?

To prevent chlorine from getting into the K-520 system, and this in turn resulting in a chlorine-iron fire.

Correct
OS SOS
1/2 0/2

5. What happens when liquid chlorine gets into the Per/Tet reactor?

Potential violent reactions.

Correct
OS SOS
2/2 2/2

6. Why are there low pressure trips on D-220?

To ensure that there is no back flow of reactor contents into D-220. The reactor runs with an excess amount of chlorine. If the reactor contents were backed up into D-220, the hydrocarbon feeds in D-220 would react with the excess chlorine coming from the reactor.

Correct
OS SOS
2/2 2/2

7. What gas is generated as a result of corrosion on an aqueous HCl tank when there is a leak in the rubber lining?

Hydrogen

Correct
OS SOS
1/2 1/2

8. What can happen to a bed in the VRU system when oxygen gets into it?

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The carbon will heat up and can have an oxidation reaction (burn).

Correct	
<u>OS</u>	<u>SOS</u>
2/2	1/2

9. Why is there a high temperature shutdown on the EDC vent compressors (K-5's)?

High temperatures from heat of compression can precipitate a reaction between the ethylene and oxygen in the vents that will result in higher temperatures and fire.

Correct	
<u>OS</u>	<u>SOS</u>
1/2	1/2

10. Why is there a low level trip on the EDC reactors?

So that there is always enough product to absorb the heat generated by the EDC reactions, and enough liquid height in the reactor bed to keep the reaction from occurring in the vapor space of the reactor.

Correct	
<u>OS</u>	<u>SOS</u>
1/2	2/2

11. While soda ash can be used on the ground to neutralize acid spills, what happens if soda ash is used to neutralize material in a drum or enclosed container?

A reaction in the container that will lead to over pressuring problems.

Correct	
<u>OS</u>	<u>SOS</u>
2/2	2/2

***The OS's averaged 78% correct.
The SOS's averaged 69% correct.***

Rolke, Richard (RW)

From: Schell Jr, Joseph G
Sent: Thursday, September 18, 1997 8:32 AM
To: Wilkinson Sr, Howard (HR); Rolke, Richard (RW)
Cc: Wagener, Gerald; Schell Jr, Joseph G
Subject: Results of Solvents Plant Operators' Interviews
Sensitivity: Confidential

Howard and Richard,

Attached are the results of the Solvents Plant operators' interviews.


solvents0897

Regards,

Joe Schell

Reactive Chemicals/Thermal Analysis Group
Analytical Sciences, Core R&D
Plaquemine, LA
(504)353-1639

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