

September 26, 1991

Gerald Wagner
Bldg 2511

cc: Doyle Haney

Response to Chlorinated Methanes 2 year Reactive Chemical Process Review

1. The autoignition temperature of Shell Thermia C hot oil is 340 C. If this autoignition temperature requires us to take special precautions other than what we already have in place, please notify us.
2. With the current reactor design and system pressure rating, it is not possible to incorporate Stade's reactor technology. However, a new reactor will be installed with the expansion project in 1993 that will incorporate the Stade design.
3. The reactive chemical consequences of Thermia C oil contacting with zinc chloride and mercuric chloride were studied in the reactive chemical lab. No thermal activity was detected under the experimental conditions.
4. Reactive chemical testing between grafoil graphite gasket material and dry chlorine was generated in Texas at the request of the Chloralkali Technology Center. Grafoil GHP, Grafoil GTR and Flexseal were tested with dry chlorine. All tested acceptable for dry chlorine service. The specific reactive chemical data can be found in reports RCT-88-094, RCT-88-0486, and RCT-88-0677.
5. One second data collection and display is physically limited. Disk drives can not store data at that rate and the software packages are competing for CPU time. The closest method that can achieve this rate is the Fast Data Logger on the GPI package. It can log data to memory based on 3600 one second memory storage and is limited to 50 data points. Any longer data storage time would cause other system packages to suffer in response time. Only a system totally dedicated to one second data collection could be expected to retrieve and retain one second data for a useful period of time. At this time we have no plans to install such a system unless the committee deems it as necessary to prevent reoccurring reactive chemical incidents.

Bruce Miles

CMP Production Supervisor

CONFIDENTIAL

DO 006552

**Chlorinated Methanes
Products Plant
Consolidated Audit**

Type

REACTIVE CHEMICAL

Area

General

Recommendations:

1. Due to reactivity concerns, titanium parts are not allowed in the Methanes block. The current trend toward centralization of maintenance and spare parts increases the risk of inadvertently importing titanium into the block. It may be beneficial to communicate this issue and associated hazards with the appropriate personnel at Solvents/EDC 1 and central warehouse.

Description: Titanium Parts

Action

Again, Methanes does not allow titanium parts in the block and the equipment replacement spare parts have been scrutinized to ensure that no one specifies titanium. This policy has been well communicated to maintenance personnel in the block. The Centralized Maintenance Organization must address this and similar issues from a safety training perspective. We will work with the CHM group to develop and execute this training.

Response

Scope

Change:

Responsibility Bruce Miles

Checkpoint Date: 1/93

Timing: 02/93

Status: Complete

**Chlorinated Methanes
Products Plant
Consolidated Audit**

Type

REACTIVE CHEMICAL

Area

General

Recommendations:

2. Make sure that the concentration of ammonia that is used for detecting chlorine leaks is below the concentration that causes flash fires.

Description: Cl₂ leak detection

Action

The Plant will verify with the Tech Center the safe level of ammonia in an aqueous solution to ensure that the concentration is below that which cause flash fires. Stock ammonia solutions will be purchased at the proper concentration.

**Response
Scope
Change:**

A stock solution of 6% ammonia is being supplied by Lang's. A communique was issued to CMP personnel on the potential problems with incorrect ammonia solutions. The communique was copied to the CMP reactive chemicals files for future training and review.

Responsibility Kevin Kelley

Checkpoint Date: 12/92

Timing: 01/93

Status: Complete

**Chlorinated Methanes
Products Plant
Consolidated Audit**

Type

REACTIVE CHEMICAL

Area

General

Recommendations:

4. Make sure that an appropriate insulation is being used on R-250A/B. Leakage hot (~225 degrees C) Shell Thermia C oil onto a high surface area insulation such as fiberglass is a flammability concern.

Description: R250 Insulation

Action

Foamglass is being replaced on the R250's with mineral wool. The foamglass has been found to be a poor insulation choice for this installation because of poor mechanical integrity. The poor insulation yields high corrosion rates on the vessel walls internally and the resulting potential for a leak. We reviewed the use of mineral wool with the Reactive Chemical Dept. and with the Tech Center. It was agreed that if the proper precautions were taken to ensure that flange leaks on the oil nozzles did not have a path to the vessel wall, then mineral wool could be used in this application. Inspection of the reactors for oil leaks was added to the operator rounds as an added precaution.

Response

Scope

Change:

Responsibility John Sacks

Checkpoint Date:

Timing: 10/ 92

Status: Complete

CONFIDENTIAL

Report Created on 11/9/94

DOW CONFIDENTIAL

Record # 90

DO 006555

**Chlorinated Methanes
Products Plant
Consolidated Audit**

Type

REACTIVE CHEMICAL

Area

General

Recommendations:

5. Consider indoctrinating contract personnel on the reactivity hazards of aluminum in contact with chlorinated organics.

Description:Aluminum Hazards

Action

We will include aluminum hazards along with the titanium hazard training included in reactive chemical follow-up item 1 above.

***Response
Scope
Change:***

Responsibility Bruce Miles

Checkpoint Date: 1/93

Timing: 02/93

Status: Complete

CONFIDENTIAL

Report Created on 11/9/94

DOW CONFIDENTIAL

Record # 91

DO 006556

**Chlorinated Methanes
Products Plant
Consolidated Audit**

Type

REACTIVE CHEMICAL

Area

General

Recommendations:

6. Review the instrumentation/controls for the PSA systems and make sure that adequate lines of defense are in place for avoiding run-away oxidations. Perhaps oxygen analyzers should be installed on each system.

Description. Oxygen in PSA's

Action

Adequate alarms and shutdown's based on temperatures are already in place in the Mod V. We are currently installing a oxygen analyzer in PSA 177C

Response

Scope

Change:

Responsibility Steve Ledoux

Checkpoint Date: 2/93

Timing: 04/93

Status: Complete

**Chlorinated Methanes
Products Plant
Consolidated Audit**

Type

REACTIVE CHEMICAL

Area

General

Recommendations:

3. Review your sodium thiosulfate system and evaluate the potential for STS inadvertently contacting low pH liquids---perhaps in the shot pond. STS reacts with HCL at less than 2 pH and releases sulfur dioxide gas. An incident recently occurred at the CPE plant involving leakage of 1400 lbs of 15% STS from a corroded pipe into a storm water system. The storm water then mixed with a waste HCL stream and released sulfur dioxide gas to the atmosphere. Four workers were treated at medical for SO₂ inhalation.

Description: STS System

Action

The STS level is monitored in the absorber tower by an analyzer and poses a low risk of contact with low pH liquids. There is a possibility of a leak from piping; but we feel there are adequate operator rounds in that area to prevent an occurrence such as the one at CPE.

Response

Scope

Change:

Responsibility None

Checkpoint Date:

Timing: 10/ 92

Status: Complete

CONFIDENTIAL

Report Created on 11/9/94

DOW CONFIDENTIAL

Record # 93

DO 006558

**Chlorinated Methanes
Products Plant
Consolidated Audit**

Type

REACTIVE CHEMICAL AUDIT

Area

General

Recommendations:

7. Review the list of leak repair compounds for the Methanes plant and make sure is current.

Description:

Action

Response

Scope

Change:

Responsibility

Checkpoint Date:

Timing:

Status: Complete