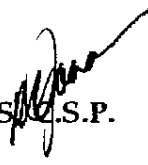


MEMO

TO: TIM MANNING

FROM: T.MICHAEL JONES  C.S.P.

DATE: November 18, 1994

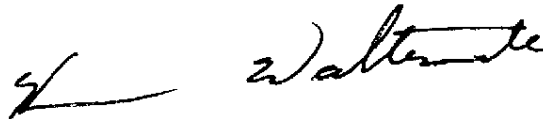
SUBJECT: 29 CFR 1910.119 PROCESS SAFETY MANAGEMENT OF HIGHLY
HAZARDOUS CHEMICALS AUDIT - LAPORTE VCM PLANT

Please find attached the Process Safety Management Assessment Report which resulted from the audit conducted by T. Michael Jones and Herm Waltemate during the week of August 29 through September 2, 1994. The audit was designed to comply with the requirements as set forth in OSHA's 1910.119(o) Compliance Audit section of the standard.

The audit report addresses each of the fourteen elements of the process safety management standard and includes a completed OSHA directive questionnaire often utilized by their compliance officers when conducting PSM reviews.

I trust this report is complete however, do not hesitate to call me for clarification should it be necessary at (713) 286-8001.

cc: Ed Martinelli
Ed Beeler
John Gressler
Con Nosal
Herm Waltemate
Steve Williams
Safety Engineers



T. Michael Jones/jb
LAPORTEMMO

NGC 12229

**ASSESSMENT REPORT
PROCESS SAFETY MANAGEMENT
OF
HIGHLY HAZARDOUS CHEMICALS
29 CFR 1910.119**

**FOR
LaPORTE VCM PLANT
LaPORTE, TEXAS**

**Audit Team
THOMAS M. JONES
HERM WALTEMAE
AUGUST 29 - SEPTEMBER 2, 1994**

**Prepared By
T.Michael Jones & Associates
P. O. Box 890482
Houston, Texas**

NGC 12230

PROCESS SAFETY MANAGEMENT ASSESSMENT

LAPORTE VCM PLANT

AUGUST 29 - SEPTEMBER 2, 1994

The purpose of this review was to meet the audit requirements for OSHA 29 CFR 1910.119(o), to identify opportunities for improvement and to recognize exceptional systems that have been implemented to address process safety management of highly hazardous chemicals.

An assessment of the implementation status for each element of the process safety management standard is included in this report. The assessment criteria will correspond to the following classification:

- Stage I: No Action
- Stage II: Evaluating Plant Practices Against System Requirements
- Stage III: Developing Plan To Implement System Requirements
- Stage IV: Implementing Action Plans
- Stage V: System In Place
- Stage VI: Improvement Reviewed and Reaffirmed This Year

Additionally, a narrative summary of each Process Safety Management Element is included to provide rationale for the status of implementation. The GEON Company and the LaPorte, Texas VCM Plant were extremely cooperative during this assessment process.

PROCESS SAFETY MANAGEMENT

FACILITY: GEON LaPorte Plant

REVIEW DATE: August 29 through September 2, 1994

REVIEWER: T. Michael Jones / Herm Waltemate

PSM ELEMENT	IMPLEMENTATION STATUS					
	I	II	III	IV	V	VI
APPLICATION				X		
EMPLOYEE PARTICIPATION				X		
PROCESS SAFETY INFORMATION					X	
PROCESS HAZARD ANALYSIS			X			
OPERATING PROCEDURES				X		
TRAINING					X	
CONTRACTORS					X	
PRE START-UP SAFETY REVIEW				X		
MECHANICAL INTEGRITY			X			
HOT WORK PERMIT					X	
MANAGEMENT OF CHANGE			X			
INCIDENT INVESTIGATION				X		
EMERGENCY PLANNING/RESPONSE				X		
COMPLIANCE AUDIT					X	
TRADE SECRET				X		
	NA	EVAL	DEV	IMP	IN PLC	REAFFIR

"Safety - A Continuous Improvement Process"

PROCESS SAFETY MANAGEMENT ASSESSMENT SUMMARY

APPLICATION: 1910.119(a)

Documentation of the rationale for including a facility or portion thereof and the logic for exclusion of specific processes within a facility are oftentimes not properly documented. The LaPorte Plant had initially included all of the facility inside the fenced perimeter. After discussing this decision, it was concluded that there were portions of the facility that really did not need to be included as PSM area. The need to graphically illustrate clear delineation of the PSM areas from the other portions of the plant will best serve the needs of this facility. There are several chemicals either manufactured or result because of the process which cause this facility to be included in the PSM program. These chemicals should be identified to include storage inventory and location. Include process system inventory if significant quantities exist which might cause or enhance catastrophic potential. There is an abundance of information available dealing with PSM compliance. However, while conducting the PSM review, it was difficult to discover documentation and records. In order to enhance the retrieval process, it is recommended that an index system be developed which identifies the location of all the various PSM documentation and the person(s) responsible for same. (*Opportunity Nos. A9401, A9402, A9403*)

EMPLOYEE PARTICIPATION: 1910.119(c)

The intent of this paragraph is to assure employers afford their employees an opportunity to become involved in the process safety management activities at an elemental level. Plant safety procedure SA-19 does not adequately address the issue of consultation with employees and access to PSM information. A stand alone employee participation procedure should be written which clearly states the participation activities provided by the employer, and includes employee access to the various PSM information. Documentation of all employee participation, recommendations, responsibility, action taken with time line for completion, and closure status will enhance this employee participation policy. (*Opportunity No. EP9404*)

Employee participation in the safety process at the LaPorte Plant is taking place. There is a good cross-section of employees on PHA's. Summary information and

details of individual PHA's are available for review should an employee have a need to view. The missing element is the procedure or policy explaining the protocol of the employee participation program.

PROCESS SAFETY INFORMATION: 1910.119(d)

Complete and accurate information relating to the process is essential for an effective process safety management program and for conducting process hazard analyses. Written safety information on process chemicals, process technology, and the process equipment involved is available at this site. The LaPorte Plant recognizes that this data base is a key element in the process hazard analysis effort.

The plant is dealing with consequences of deviation through its operating policies. Continue to address this subject on an expeditious schedule.

The plant's VIEWPOINT program is an excellent information storage and retrieval system. As this data management system continues to mature, process safety management tie-in needs will certainly enhance this software.

Due to the inordinate amount of information required by this element, it is suggested that an individual index system on the process safety information section be developed. This will help to reduce the possibility of omitting critical data required by this section. (*Opportunity PSI9405*)

PROCESS HAZARD ANALYSIS: 1910.119(e)

Employers are required with employee participation to develop a thorough, orderly, systematic approach for identifying, evaluating and controlling processes involving highly hazardous chemicals. There are six specific subsections listed below with a statement of the status of each respective to the LaPorte VCM Plant.

1. **Setting Priorities:** An initial hazard evaluation of the processes covered by the standard has been made. Rationale for the official priority schedule must be documented and should be based on 1) the extent of the process hazards, 2) number of potentially affected employees, 3) age of the process, 4) operating history. There is also a need to adjust the PHA schedule at this time to accommodate anticipated capital project workload. (*Opportunity PHA9406*)

2. **Appropriate Methodology:** Plant safety procedure SA-19 identifies that the LaPorte Plant has chosen the HAZOP methodology for major unit revisions and has been used for the initial process evaluation. Smaller process units will be evaluated by the "What-If" or "Job Safety Analysis" methods.

When conducting PHA's on the processes covered by the standard, it is required to address facility siting and human factors. Through interviews, it was verified that human factors and siting is considered during PHA's but not documented. Employee work stations, valve locations, egress from units, and lighting are examples of human factors to be considered. Location of tankage, control rooms, and prevailing wind direction are considerations respective to plant or equipment siting. Documentation that these two items are considered is required. *(Opportunity No. PHA9407)*

3. **Disposition / Handling Team Findings:** The plant's PHA process is thorough and appears to cover in sufficient detail all elements necessary for a process review. Interviews with a limited number of key people indicated that recommendations are resolved, but there is no written documentation that closure has been completed. A formal closure and/or reasons for actions taken must be documented. The finding should include a written schedule of target dates for completion, action to be taken, and the person responsible to resolve. Operating, maintenance and any other personnel whose work assignments are in the impacted process area and who may be affected by the recommended actions must be advised of the resolutions. *(Opportunity No. 9408)*
4. **Process Hazard Analysis Will Address:** Previous process related incidents at this facility can provide a "look back" opportunity which can be a valuable resource to prevent recurrence. Reviewing information contained in these experience yielding narrative reports can be a good source document in preventing catastrophic events. It is recommended that this type of information be added to the PHA documentation. *(Opportunity No. PHA9409)*
5. **Process Hazard Analysis Team:** Team membership includes experience from plant and process engineering, operations personnel, safety and environmental and at least one person skilled in the HAZOP methodology. Primatech software is presently being used to complete PHA's at the facility. It is recommended as PHA team members are assembled that a biographical profile (reference Figure 1) be completed on each team member and included as part of that specific PHA file. *(Opportunity PHA9410)*

6. **Engineering / Code Standards:** It is recommended that as the PHA's are being conducted, applicable standards and codes that are being used as part of the evaluation process be identified and included as part of the PHA documentation. (i.e., ASME, API, ANSI, or internal company engineering standards for piping specification, materials for construction and other design parameters) (*Opportunity No. PHA9411*)

OPERATING PROCEDURES: 1910.119(f)

The requirements of this section are for the employer to provide clear instructions for safely conducting activities involved in the covered processes consistent with the process safety information assembled by the LaPorte VCM Plant. The standard requires that operating procedures be reviewed as often as necessary to assure that they reflect current operating practice. In addition, operating procedures are to be certified annually by the employer to insure that the procedures are current and accurate. (*Opportunity No. OP9412*)

The operating procedures reviewed and verified in the field were in good order, easy to find and were generally in excellent condition. Operating personnel were knowledgeable about procedure contents and confirmed that the training records on file were accurate. There is presently a major task being undertaken to revise all operating procedures. This revision effort will address the one major area missing from the existing operating procedure which is consequences of deviation. The inspection team did review a revised operating procedure that included the consequence of deviation and consider it to be very good. This rewriting and training effort should be expedited. (*Opportunity No. OP9413*)

The plant should be commended as it moves toward ISO 9002 certification. Control copies of plant safety procedures are in the field. This greatly reduces the chances of an employee being guided by an out-of-date or unauthorized safety procedure. The entire ISO format lends itself nicely to the detailed documentation required by the PSM standard.

TRAINING: 1910.119(g)

The intent of this section is to help employees understand the nature and causes of problems arising from process operations. Training will increase an employee's awareness with respect to the hazards particular to a process. An effective training program can significantly reduce the number and severity of incidents arising from

process operations and can be instrumental in preventing small problems from becoming or leading to catastrophic events. Minimum training programs must include initial training, refresher training and documentation.

Complete records are available on operator training. The documentation process at the LaPorte Plant includes syllabus, person conducting the training and qualifications, attendees, date of training, and evaluation of understanding. Interviews in the field with operating personnel verified the completeness of the training effort.

Employees that were "grandfathered" are certified with documentation to the file. It is the position of the plant that each employee be qualified on two jobs, making it unlikely that a person would be required to cover a job for which he/she has not been trained. In the event this should happen, that person would have to be trained and certified to operate the position safely before allowed to operate the job alone.

There is documentation that employees were consulted on the frequency for retraining. The frequency selected was at least once every two years.

CONTRACTORS: 1910.119(h)

The intent of this section is to require employers who use contractors to perform work in and around processes involving highly hazardous chemicals establish a screening method to select contractors who will accomplish the task without compromising the safety of the LaPorte facility. The contractor has responsibilities and must assure that their employees are trained on performing the job safely, the hazards relating to the job and understand the provisions of the owner's emergency response plan.

The plant's contractor screening and selection process is good. SA-9, Contractor Safety, is complete and appears to address the needs of the plant. The audit team did critique a contractor safety orientation meeting on the subject of confined space and found the session to be complete. It is understood that a confined space video will be available in the near future and will further enhance this orientation effort. The GEON Company's contractor safety questionnaire is one of the best this auditor has seen. This information provides valuable data for the selection of contractors.

There was one area of concern observed involving a transport truck which entered the plant and the driver did not have a current (valid) safety orientation according to records examined. (*Opportunity No. C9414*)

It is recommended that a post job evaluation be conducted on contractors that perform work in the LaPorte Plant. This evaluation should be geared more toward the safety performance of the contractor, but can include more traditional job evaluation subjects. Contractors that enter the plant on a routine basis should be evaluated annually, while those that come in the plant infrequently should be evaluated after each job. *(Opportunity No. C9415)*

PRE START-UP REVIEW: 1910.119(i)

New processes and modified processes which necessitate a change to the plant's process safety information dictate considerations before highly hazardous chemicals are introduced into the process. These requirements include a pre start-up review to confirm that the following actions have been addressed:

- Construction and equipment is according to design and specifications.
- Safety, operating, maintenance and emergency procedures are in place and adequate.
- A PHA has been performed, recommendations have been resolved or implemented.
- Management of change and training of each employee involved in the process has been completed.

Pre start-up reviews are being conducted (verified through interview with new construction supervisor) by operations and safety. This activity should be documented and made part of the PSM file. A good example of a project walk-through is attached. *(Opportunity No. PSSR9416)*

MECHANICAL INTEGRITY: 1910.119(j)

This section establishes requirements to assure that equipment used to process, store, or handle highly hazardous chemicals is designed, constructed, and maintained to minimize the risk of a chemical release. The elements of a mechanical integrity program include the identification and categorization of equipment and instrumentation, the development of written maintenance procedures, training for process maintenance activities, inspection, testing, correction of identified deficiencies in equipment that are outside acceptable limits defined by the LaPorte Plant's process

safety information and a quality assurance program. The plant needs to prepare a written mechanical integrity procedure that meets all of the requirements of this standard. The Avon Lake mechanical integrity procedure is a good example to use as a guideline. *(Opportunity No. MI9417)*

Due to the critical nature of the LaPorte processes, the verification of materials of construction is critically important. Should special valve trim or special alloys be necessary to assure a safe system, it is necessary to insure that the plant has received exactly what was ordered. *(Opportunity No. MI9418)*

During a walk-around inspection of the plant, the ammonia storage was inspected and the following items should be reviewed: 1) condition of piping on this vessel, 2) pressure vessel code information (boiler plate) is not physically attached as an integral part of the storage tank, 3) practice of back welding screwed piping in lieu of socket weld fittings. *(Opportunity No. MI9419)*

HOT WORK PERMIT: 1910.119(k)

Employers must control, in a consistent manner, non-routine work in process areas covered by the standard. Specifically, this subsection is concerned about permitting hot work operations associated with welding and cutting in highly hazardous chemical process areas. Minimum requirements to comply with this section includes meeting OSHA's 1910.252(a) standard.

Hot work in this facility is tightly controlled as was expected. The plant's hot work policy identifies areas where permits are required and establishes classifications for hot work. To perform hot work in a classified area (hazardous) there can be no alternative to doing the job. A written plan has to be approved with specified precautions taken before the work can begin. Daily calibrations of detection instrumentation per manufacturer's recommendation is being conducted at this plant.

MANAGEMENT OF CHANGE: 1910.119(l)

Careful consideration of all modifications to equipment, procedures, raw materials and process conditions other than "replacement in kind" must be controlled by identifying and reviewing prior to implementing a change. The plant has a management of change procedure, but has not fully implemented the policy. The plant also utilizes the M.O.C. policy to make changes to the plant's emergency response plan. The process for informing employees, plant-wide, of any change complete with documentation is exceptional. *(Opportunity NO. MOC9420)*

INCIDENT INVESTIGATION: 1910.119(m)

Every incident that occurs in the plant that could have resulted in a catastrophic release of a highly hazardous chemical in the work place must be investigated. The plant's culture is to report any incident with potential. The preparation of narrative reports to document the investigation activities includes causal analysis to pinpoint the root cause is a normal course of action and has performed well in the LaPorte Plant. However tracking of the completion of corrective action must become part of the system.

The plant has an opportunity to enhance this process by establishing a system to bring to closure all corrective action recommendations resulting from chemical releases in a PSM area. This closure action should become part of the PSM file documentation. (*Opportunity No. II9421*)

EMERGENCY PLANNING AND RESPONSE: 1910.119(n)

This section requires employers to address what action employees are to take when there is an accidental release of highly hazardous chemicals.

The plant has a very adequate emergency response plan. In-plant response capabilities for both fire and chemical release / spill can be handled with on-site personnel around-the-clock. All GEON employees are trained to the first responder operations level. There is another group of responders trained to the hazardous material technician level and a select group trained to the incident command level. The plant is a primary responder for VCM transportation incidents in this region.

A minor adjustment is needed to enhance this excellent program. There are not published evacuation routes to the two emergency assembly points in the plant. These directions should be displayed in all areas in the plant where people can observe them. (*Opportunity No. EPR9422*)

COMPLIANCE AUDIT: 1910.119(o)

Employers are required to audit (self evaluate) the effectiveness of their PSM program to identify improvement opportunities and take appropriate corrective action to resolve deficiencies. Minimum requirements include:

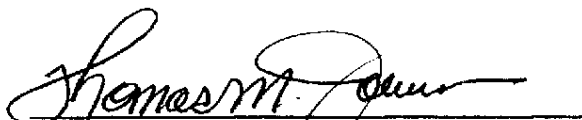
- Audit at least every three years
- Maintain at least the last two audit reports
- Track to completion the audit findings and document the closure action.

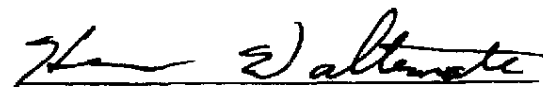
TRADE SECRETS: 1910.119(p)

This section requires employers to provide all information necessary to comply with personnel developing sections (d) process safety information, (e) PHA's, (f) operating procedures, (n) emergency planning and response, and (o) compliance audits without regard to possible trade secrets.

The GEON Company and the LaPorte, Texas VCM facility have provided all information requested to conduct the 1910.119 Process Safety Management Audit.

The one recommendation thought to improve the trade secret section would be to develop (or verify existence) a secrecy agreement document for specific contract employees that work in sensitive areas of the plant. (Opportunity No. TS9423)


T. Michael Jones, CSP


Herm Waltemate

November 21, 1994
Date

November 30, 1994
Date

HAZOP TEAM MEMBER BIOGRAPHY

1) NAME: _____

2) JOB TITLE: _____

3) PREVIOUS POSITIONS HELD: _____

4) YEARS EXPERIENCE: _____

5) FIRE SCHOOL EXPERIENCE: _____

6) EMERGENCY RESPONSE TEAM EXPERIENCE: _____

7) FIELD OF EXPERTISE (ie: Poly Room Head Operator, Charge Operator, Pipefitter):

8) OTHER QUALIFICATIONS: _____

PSM AUDIT

IMPROVEMENT OPPORTUNITIES LaPORTE VCM PLANT

1994

ELEMENT	ID#	DESCRIPTION	RESPONSIBILITY	TARGET DATE
Application 1910.119(a)	A9401	Graphically illustrate PSM areas.		
	A9402	Develop list of PSM chemical in storage and process.		
	A9403	Develop index of PSM materials, location and responsible person.		
Employee Participation 1910.119(c)	EP9404	Develop written employee participation procedure. (Example from Avon Lake is a good guideline.)		
Process Safety Information 1910.119(d)	PSI9405	Develop index for this information system to assure all required data is on file.		
Process Hazard Analysis 1910.119(e)	PHA9406	Revise the plant's PHA schedule and identify rationale for priority.		
	PHA9407	PHA's must address facility siting and human factors complete with appropriate documentation.		
	PHA9408	Develop a system to track recommendations to completion. Communicate resolutions to appropriate people that work in the PSM area.		
	PHA9409	Review incident reports involving area to be HAZOPed. Document as part of individual HAZOP file.		
	PHA9410	Develop biography profile on each HAZOP team member. Include profile as part of individual HAZOP file.		
	PHA9411	Include as documentation the specific standard or code being considered while conducting PHA's.		
Operating Procedures 1910.119(f)	OP9412	Establish a system to certify annually that operating procedures are current and accurate and reflect existing process technology.		
	OP9413	Complete revisions to plan operating procedures to include consequence of deviation and safety systems.		

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ELEMENT	IO#	DESCRIPTION	RESPONSIBILITY	TARGET DATE
Contractors 1910.119(h)	C9414	Evaluate the system presently used to verify that the truck drivers who enter the plant have current safety orientation status.		
		Implement a post safety evaluation system (form) for contractors that work in plant.		
Pre Start-Up Safety Review 1910.119(i)	PSSR9416	Document pre start-up safety reviews and file with PHA's on same job.		
Mechanical Integrity 1910.119(j)	MI9417	Prepare a written mechanical integrity procedure to comply with 1910.119(j)		
	MI9418	Initiate a formal inspection protocol to assure materials and equipment are received as ordered.		
	MI9419	Verify compliance with OSHA's 1910.111 storage and handling of anhydrous ammonia standard. Take corrective action to resolve under insulation external corrosion on piping.		
Management of Change 1910.119(l)	MOC9420	Fully implement the Management of Change Policy, train for understanding and document same.		
Incident Investigation 1910.119(m)	II9421	Develop a system to bring to closure all safety / environmental incidents that occur in a PSM area. Document this closure action in the PSM file.		
Emergency Planning and Response 1910.119(n)	EPR9422	Publish evacuation routes in areas indicating directions to the two plant assembly points.		
Trade Secrets 1910.119(p)	TS9423	Verify secrecy agreement for contractors who work in sensitive areas of the plant.		

NGC 12244

AUDITOR QUALIFICATIONS

T. MICHAEL JONES:

Mike Jones has worked in the petrochemical industry with The BFGoodrich Chemical Company, Diamond Shamrock Chemicals, Cain Chemical and Occidental Chemical Corporation for 29 years. He was the Corporate Manager - Facility Safety and Industrial Hygiene for OxyChem until he elected early retirement in September, 1993, to form the company of T.Michael Jones & Associates. Mike is a Certified Safety Professional with extensive experience in plant operations, maintenance, engineering design/construction, safety, industrial hygiene, emergency management, and process safety management. Product manufacturing experience includes synthetic rubber, PVC resin, vinyl chloride monomer, olefins and aromatics, ethylene dichloride, caustic soda, chlorine, and ethylene oxides/derivatives. He holds a B.S. Degree in Industrial Arts and Chemistry from Stephen F. Austin University and a M.S. Degree in Engineering Management from Louisiana State University Baton Rouge.

HERMAN WALTEMADE:

Mr. Waltemate has worked for The GEON Company/BFGoodrich Company for 29 years in the area of safety. He holds a B.S. Degree in Industrial Technology from South Illinois University. He started work with BFGoodrich as Safety Inspector at the Calvert City Vinyl Chloride Monomer Plant. He was promoted to Senior Safety Engineer at the Akron Chemical Plant. Since that time he has worked in the Corporate Safety Department with various accident prevention responsibilities. He has been involved with several projects involving the safety design and the safety auditing of PVC operations.