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02 Inv Date	[4 / 9 / 84]	Hour/#	[10]																									
03 County	[Harris]	Jurisdiction	[070]	SS: AA[X] IA[] DA[]																								
04 Co Name	[Tenneco Polymers, Inc.]		PA	[]																								
05 Plt Name	[]	PSD Flg	[]	[]																								
06 Mail 1	[Post Office Box 849]	EPA Cls	[]	VOC []																								
07 Mail 2	[]	A1/A2 Mo	[]	[]																								
08 Mail: City	[Pasadena]	St	[Texas]	Zip [77501]																								
09 Location	[]	A2 SchYr	[]	[]																								
10 Near City	[]	Pr Rg Pl	[]	[]																								
11 Group	[19] [] []	Prncpl Bsns	[Polyvinyl Chloride and Methanol]																									
12 Mgr Name	[C. S. Stutts]		TSP Actn	[]																								
13 Title	[Manager]		Ph#	[713] - [479 / 3411]																								
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14 Permit No	[] []	Approve	/	Exempt / Void /																								
15 R-Pmt Eng	[]	Deny	/	Hold / Discuss /																								
16 CAPS Ptf	[]	All NSPS Pts	[]	All NESHA Pts []																								
17 Emis Ptf	[]	Pt Desc	[]	Pred Reg Pol []																								
18 Act Code	[]																											
19 Investigation Typ	[Burning]	Complaint	[]	Permit [] Non-Inv []																								
20 Obser Smpl	[]	Rule 7/8	[]	Sampling [] SIP [X] Site []																								
21 Src Surv	[]	Vehicle	[]	NSPS [] NESHA [X] Other []																								
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40 Person Contacted [J. W. Kachtick] Title [Manager Env. Sci.] Ph# [884-4110]																												
41 Photos: Yes [] No [X]																												

.....*S. N. N. N.*.....
Investigator(s)

.....*9/10/84*.....
Date

.....*Bill L. N. N.*.....
Approved By
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White Original
Canary Keypunch
Pink Region
Green Permit
Goldenrod File
TACB-SI Form (10/82)

An annual compliance investigation was conducted on April 9, 1984 at Tenneco Polymers, Inc. During this investigation, Richard Gigger of the Environmental Protection Agency's (EPA) Houston office accompanied me for a HESHAP overview inspection. Mr. J. W. Kachtick provided the requested information during an office conference and later arranged a thorough plant tour. Using a portable VOC monitor we checked several valves and detected no leakages. We also observed the company's computer recording systems of its monitoring points and its calibration method. During the plant tour, Mr. Gigger found a minor violation of HESHAP Rule 40 CFW 61.65(b)(8)(iii)(B). The calibration gas cylinders were not marked with its date of preparation and its maximum shelf life. When this was brought to the attention of Mr. Kachtick, he replied that the cylinders were received without such information. Beside this minor violation, the company was found to be in compliance with the Board Rules and Regulations and EPA's standards for vinyl chloride.

Tenneco has only two process units at this site. One is a methanol plant which has been out of service since 1982 and the other is a PVC plant which is operating at approximately full capacity.

The process details are confidential and PVC plant emission sources and emissions have been reported in 1973 SIP report. Therefore, these details will not be presented in this report. However, a general description of the suspension process used in PVC production is given below.

POLYVINYL CHLORIDE PRODUCTION

Background:

Polyvinyl chloride (PVC) resin is one of the most versatile synthetic resins. Production and uses of this resin in the United States is estimated to be 5 to 7 billion pounds in a year. The resin is used in a wide range of end products. The major uses are in pipe and electrical conduits, floor covering, insulation for electrical wires and cable, water hoses, and phonograph records.

PVC can be produced by using one of the following four different methods: (1) Dispersion polymerization, (2) Bulk polymerization, (3) Suspension polymerization or (4) Solution polymerization. The common characteristic of all process is conversion of gaseous VCM to the granular PVC. The suspension process is the most common method of polymerization. This method accounts for about 85% of the total PVC produced in the United States. Tenneco uses this technology; therefore, it is described below in detail.

Suspension Polymerization:

Tenneco has ten PVC reactors with the capacity of about 35,000 gallons each. The reactor is charged with water, monomer, catalyst and other additives depending on the quality of the end product desired. The reaction takes place under pressure. Initially the reactant temperature is raised to start the reaction. It is an exothermic reaction; therefore, a certain temperature is maintained by using heat transfer jackets.

When the monomer conversion has proceeded to a desired degree the reaction is stopped. The unreacted monomer is sent back to the recovery system. The resin slurry is then transferred to five slurry tanks. The unreacted VCM from the slurry is removed by means of a stripping method. There are five slurry strippers. The slurry from the reactors is pumped through screening units and stored in slurry tanks. The mixed slurry is then sent to continuous stripping columns where VCM is reduced to below 400 ppm. The recovered VCM is sent to the storage tank for recycling. The non-condensibles are passed through a chilled condenser and a carbon bed before being fed to the incinerator where VCM is reduced to below 10 ppm. Heavy fractions from the bottom of the strippers are also incinerated.

The stripped slurry is filtered through centrifuges where a large amount of water is removed. Finally, the resin is dried by using hot air dryers. The fines are controlled by cyclone separators. The dried product is screened into different sizes and specifications. The final product is pneumatically transferred to silos. The particulates at the silos are controlled by bag filters. The company uses a closed system for PVC loading from the silos to the railcars.

About 95% of the relief valves throughout this plant are tied to a flare. It is not a steam injected flare. The company has claimed that the flare has 95% efficiency; however, EPA does not accept it (the flare) as a control device which can reduce the VCM concentration to below 10 ppm. All other process vents are incinerated as required by NESHAP standards to bring the VCM concentration below 10 ppm.

The compliance status of this account with TACB Rules and Regulations is as follows:

General Rules (Chapter 101)

Rule 101.4 - In Compliance (IC). No odors of any kind were detected. During October/November 1983, Harris County Pollution Control Department (HCPCD) received several complaints regarding an onion-like odor from this plant. On October 31, 1983, HCPCD issued a notice of violation to Tenneco for confirmed odor nuisance. Later, the company corrected this problem and achieved compliance. For details, please see Tenneco's letter of 12/13/83 to HCPCD.

Rules 101.6 and 101.7 - IC. The company submits its plant upset and scheduled maintenance reports to TACB. In 1983, they reported about 12 cases of VCM releases from various relief valves. These releases were flared.

Rule 101.10 - IC. The company has accomplished the requirements of the 1980 E.I. This report is complete and in order.

Rule 101.20 - IC. The company is found to be in compliance with all applicable NESHAP regulations, except a minor violation of Rule 40 CFR 61.65(b)(7)(iii)(B) for the leak detection and elimination program. The date of the vinyl chloride calibration gas cylinder preparation and its maximum shelf life were not marked on the cylinders. Region 7 has sent a letter to Tenneco regarding this matter and asked the company to correct the problem as soon as possible. Please see the NESHAPS Inspection Checklist.

Rule 101.23 - Not Applicable (NA). The company does not have any approved bubble plan.

Regulation I (Chapter 111)

Rule 111.1 - NA. No outdoor burning is conducted at this plant.

Rule 111.2 - IC. The company informs TACB and HCPCD before conducting fire fighter's training.

Rule 111.3 - NA. Tenneco does not handle any material which is capable of igniting spontaneously.

Rule 111.11 - NA. There is no incinerator to burn garbage. A contractor hauls off the non-industrial solid waste to an approved landfill.

Rules 111.21 and 111.22 - IC. No visible emissions were observed from the plant flares and stacks.

Rule 111.23 - IC. There were no visible emissions from the enclosed buildings.

Rule 111.25 - NA. Tenneco does not have any stack with flow rate of 100,000 acfm or greater.

Rule 111.41 - 1A. The company is located in the attainment area for particulates.

Rule 111.51 - 1C. The sources of particulates are the silos and the loading racks. Emissions at these points are controlled by baghouses and by closed system loading of railcars.

Rule 111.52 - In Apparent Compliance (IAC). No property line sampling has been conducted to determine actual ground level concentration (GLC) of particulates. As mentioned under Rule 111.51, Tenneco has adequate control equipment for particulates; therefore, the net GLC is assumed to be negligible.

Rule 111.53 - 1A. There are no steam generators with 2500 mm Btu per hour heat input.

Regulation II (Chapter 112)

Rule 112.6 - IAC. Natural gas and low sulfur waste oil are the fuel for boilers and incinerators. Emissions of sulfur dioxide at these sources is expected to be well below the limit specified by this rule.

Rule 112.7 - IAC. Because of the low sulfur fuel the net GLC for sulfur dioxide is expected to be less than 0.29 ppm averaged over any 30 minute period.

Rule 112.31 1A. There are no sources of hydrogen sulfide.

Regulation III (Chapter 113)

Rule 113.3 - 1A. There are no sources of inorganic fluorides as beryllium compounds.

Regulation V (Chapter 115)

Rule 115.101 - 1C. Tenneco has a total of 13 fixed roof tanks. Emissions at these tanks are controlled by six chilled condensers. The temperature at these condensers is being monitored on a routine basis to check and maintain their efficiency. VCM is being stored in two spherical pressure tanks which are equipped with safety relief valves.

Rule 115.102 - 1A. There are no floating roof tanks.

Rule 115.111 - 1C. VCM is loaded and unloaded under a closed system. Vapors from the methanol loading and unloading operations are controlled by water scrubbers.

Rule 115.131 - 1C. Tenneco has two above-ground gasoline storage tanks for plant vehicle use. One is for leaded gasoline (3000 gallon capacity) and the other is for unleaded gasoline (1000 gallons capacity). During 1983, consumption of gasoline was below 50,000 gallons. The tanks are equipped with submerged fill pipe. Gasoline from the trucks is transferred to these tanks by a closed system.

Rule 115.141 - 1A. There are no oil/water separators.

Rule 115.163 - 1C. There are no vents from the PVC and methanol plants that are discharged directly to the atmosphere.

Rule 115.172 and 115.173 - 1A. Tenneco does not have any degreaser or conveyor of solvent cleaning system. However, there is a closed cleaning system using tetrahydrofuran for overhead condensers on the reactors. No VOC emissions are expected at this point.

Investigator's Comments
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Pasadena, Harris County

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Rule 115.271-.275 - IC. Currently, Tenneco is in compliance with VCM leak detection and monitoring program (NESHAP 40 CFR Subpart F), for details please check NESHAP Checklist. The company is also working on a TACB fugitive emissions control plan and intends to submit the plan by December 31, 1984, (Rule 115.275).

Regulation VI (Chapter 116)

Rule 116.1 and 116.4 - IC. A list of permits issued to Tenneco is attached. Permit C-7694 for the methanol expansion is still outstanding. PI-3 was submitted on November 2, 1981 but due to economic reasons the plant has been shutdown since 1982. Mr. Kachtick stated that this plant will remain shutdown for an indefinite period of time.

Regulation VII (Chapter 117)

Rule 117.1 - MA. Tenneco does not have any steam generators with more than 600,000 lb/hr steam capacity.

Regulation VIII (Chapter 118)

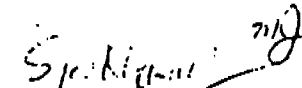
Rule 118.5 - IC. On April 11, 1984, Tenneco submitted a plan to reduce VOC emissions during an air pollution episode.

Regulation IX (Chapter 119)

Rule 119.2 - MA. Tenneco does not have any catalyst regenerators which emit carbon monoxide.

Conclusion

During this investigation, Tenneco appeared to be in compliance with all TACB Rules and Regulations and applicable NESHAP standards regarding vinyl chloride monomer except for a minor violation as noted in Rule 101.20. The company does not have any outstanding Board Orders, Court Orders or compliance plan.


Syed Moynuddin
Region 7

SM/als