REQUEST FOR WAIVER OF COMPLIANCE

ABERDEEN PVC PLANT

The General Provisions discussion regarding Hazardous Air Pollutants, 40 CFR 61.10, describes the information needed for requesting a waiver of compliance. The Aberdeen Plant has no specific forms for filling out this information. In lieu of submitting forms, we have attached the information as described in 40 CFR 61.10 on the following pages.

REQUEST FOR WAIVER OF COMPLIANCE

ABERDEEN PVC PLANT

1. Name And Address Of The Owner

   Conoco Chemicals Company
   P. O. Box 91, New Highway 25
   Aberdeen, MS 39730

2. Location Of The Source

   The Aberdeen PVC Plant is located at:

   Lat. N 33° 48 min. 32 sec.
   Lon. W 88° 32 min. 33 sec.

   In the City of Aberdeen in the County of Monroe in the State of Mississippi.

3. Type of Hazardous Pollutant Emitted

   The Aberdeen PVC Plant, in the course of its normal operations, emits vinyl chloride monomer. On December 24, 1975, under section 112 of the Clean Air Act, the Environmental Protection Agency added vinyl chloride to the list of hazardous air pollutants.

4. Description Of The Stationary Source

   Please refer to Attachment A for a description of the nature, size, design, and method of operation.

5. Weight Of Material Processed In Past 12 Months

   Please refer to Attachment B for historical operating rate data for the Aberdeen Plant.

6. Description Existing Control Equipment

   Please refer to Attachment C for information concerning existing control equipment for each emission point.

7. Statement Regarding Compliance

   Compliance with all facets of the EPA regulation will not be possible by January 20, 1977. Additional time is required to install the control systems, optimize their operation and conduct the testing required to prove compliance.

7. Continued

As the Aberdeen Plant will not be in compliance as of January 20, 1977, we request the EPA to grant us a waiver for a period during which operating and equipment modifications, which are now in progress, will be completed.

Based upon our best information upon requirements for process design calculations, mechanical design engineering, vendor delivery data, startup debugging and compliance testing, all necessary equipment for total plant compliance will be installed and fully operational by May 1, 1978. Between May 1, 1978 and June 1, 1978 we will prepare an Emission Testing Program to prove compliance and will submit this to the EPA for approval. Emission testing to prove compliance will commence on July 1, 1978. The plant will have completed all testing proving compliance with all areas of the emission regulation by August 1, 1978. Our schedule is to submit our emissions report including all data and calculations showing that compliance has been achieved by August 31, 1978.

In support of our request for a waiver we are including the following:

Attachment D - Compliance Plan

For each emission limitations this section contains the following data:

Emission Limitation Requirement
Emission Sources Applicable
Compliance Action
Compliance Schedule
Interium Control Steps

As indicated in Attachment D, we intend to commence compliance testing as of July 1, 1978. At that time all control devices will be operational. In the interium period we will be obtaining data and reporting this information. We assume that the attached information is sufficient so that the EPA will grant us a waiver of emission testing per 40 CFR 61.13 until such time as all control systems are operable.

REQUEST FOR WAIVER OF COMPLIANCE

ABERDEEN PVC PLANT

ATTACHMENT A

DESCRIPTION OF THE STATIONARY SOURCE

1. General

The Aberdeen Plant includes facilities to produce polyvinyl chloride resins, PVC compound, PVC dry blend and plasticizer. The compound, dry blend and plasticizer operations are downstream operations which do not involve vinyl chloride monomer but only the further processing of the resin product. Thus, these operations are not relevant to the compliance plan on VCM emissions.

The Plant has the capability of producing 1 MM pounds per day (350 MM pounds per year) of PVC resin. Existing operating permits for water effluent limitations (NPDES Permit No. 0001970) and particulate emission limitations (Mississippi Air and Water Pollution Control Commission Permits No. 1673, 1674, 1675 and 1676) are based upon this operating rate which was demonstrated on a daily basis in late 1974.

The Plant has not functioned at its design capacity during either 1975 or 1976. Massive plant changes have been in progress during this period relative to meeting OSHA limits on employee VCM exposure and anticipating the EPA regulations on atmospheric emissions. These changes have necessitated the temporary shutdown of approximately 50% of the Plant's reactor facilities for revisions. We anticipate resuming full operation at design capacity during 1977.

2. Size

a) Vinyl Chloride Monomer Unloading

Vinyl Chloride is received into the plant in railcars. The plant has six unloading spots for such railcars. Maximum unloading capability is about 1.5 MM pounds per day or 525 MM per year.

The monomer is stored in two bullets and in a large sphere at the unloading site. Total storage capacity is approximately 6 MM pounds. This represents 6 days storage at the plant design capacity of 350 MM pounds per year.

b) PVC Polymerization Capacity

The plant attained its full design polymerization capacity in late 1974. This capacity was approximately 1 MM pounds per day or 350 MM pounds per year.

At that time, the plant was operating 44 polymerization reactors. 40 of these were 2200 gallon, glass lined reactors. The remaining four were 18000 gallon, electropolished, stainless steel reactors.

In early 1975, in response to a slack market demand, the 40, small, 2200 gallon reactors were temporarily shutdown. Various engineering feasibility studies were conducted regarding the necessity to reduce employee exposure to VCM and in anticipation of the EPA regulations on emissions. These studies concluded that due to limitations of design, the multitude of point emission sources and the manual nature of the operation, the eventual compliance with OSHA and EPA restrictions was uncertain. Control of emissions in the large reactors was deemed

far more manageable due to design considerations and automated control systems.

As a result of these various studies it was determined to temporarily restrict production to approximately 50% of design capacity. The 40, 2200 gallon reactors were permanently shutdown. Engineering efforts for VCM containment have been concentrated on the large, 18000 gallon reactors. The temporary production loss will be regained through installation of four additional 18000 gallon reactors. This work is now in progress. It will be completed and full productivity will be restored at design capacity during 1977. At that time, the polymerization facilities will consist of eight 18,000 gallon reactors.

c) PVC Drying Capacity

The plant has seven, rotary, gas fired dryers. Each has a capacity of 50 MM lbs./Yr. for the full rated design capacity of 350 MM Lbs./Yr.

d) Product Storage Capacity

The PVC resin product is shipped from Aberdeen in railcars, in trucks and in bags. Silo storage is 4.6 MM lbs. Warehouse space for bag material is approximately 50 MM pounds in internal and leased storage.

e) Other

In addition to PVC resin production, the plant operates two PVC compound lines, a dry blend facility and a plasticizer manufacturing plant. The rated capacities of these units are:

Compound	-	85 MM Lb./Yr.
Dry Blend	-	40 MM Lb./Yr.
Plasticizer	-	40 MM Lb./Yr.

3. Design and Method of Operation

Section 1 of Attachment D contains an overall process flow drawing for the Plant. This drawing also shows how the major emission control systems for vent gas incineration, in process waste water stripping, slurry stripping and fugitive emission recovery will be integicated into the overall plant operation.

a) Vinyl Chloride Monomer Unloading

Attached Figure 1 depicts the Vinyl Chloride unloading operation.

Vapors from the sphere are compressed with Corken compressors. The pressurized gas flows to the railcar and forces the liquid to flow to one of the two VCM liquid storage bullets. The liquid from the bullets is periodically pumped to the 15,000 barrel storage sphere.

The Aberdeen Plant has the capability of producing 1 MM pound per day of PVC resin. This is true of all plant facilities excepting polymerization capacity. All other plant facilities, including VCM unloading, PVC slurry storage, PVC dryers, PVC silo storage, PVC bagging equipment, particulate emission abatement equipment and water pollution treatment facilities were designed to be functional at the 1 MM pound per day rate.

The polymerization facilities have been undergoing upgrading changes since 1972. Reactor facilities to function at the 1 MM pound per day rate were in place in late 1974. However, polymerization capacity has, since early 1975, been limited to 550 M pounds per day as a result of substantial plant changes necessitated by the OSHA standard and in anticipation of the EPA regulations. These changes will be completed and full productivity restored at 1 MM pounds per day in late 1977.

In 1972 the Aberdeen Plant consisted of three reactor buildings (V-10, V-11, and V-12) each consisting of twenty polymerization reactors. In addition, the plant had a single, large experimental reactor (D-300) involving technology developed in the Aberdeen Plant.

1972 Capacity In Polymerization	
V-10	65 MM Lb./Yr.
V-11	65 MM Lb./Yr.
V-12	75 MM Lb./Yr.
D300	30 MM Lb./Yr.
Total	235 MM Lb./Yr.

At this point, a plan was developed to increase and modernize the reactor facilities to achieve a 375 MM pound per year production. Extensive, simultaneous changes in dryers, silo storage and unloading facilities were also planned.

The first step in this program involved the shutdown of the 20 small reactors in the V-10 building, the addition of another large reactor (D-400) and debottlenecking of the V-12 small reactors and the two large reactors. This step was completed by 1974.

1974 Capacity In Polymerization	
V-10	Shutdown
V-11	65 MM Lb./Yr.
V-12	100 MM Lb./Yr.
D300/D400	100 MM Lb./Yr.
Total	265 MM Lb./Yr.

The next step was to complete debottlenecking of the V-11 small reactors and to add two additional large reactors (D500 and D-600). This modification was completed in December 1974. Changes in auxiliary facilities (dryers, silos, etc.) were also completed in 1974.

TABLE 5

HISTORICAL OPERATING RATE DATA

ABERDEEN PVC PLANT

Period	VCM Unloading	PVC Resin	PVC Dry Blend	PVC Compound	Plasticizer	Total Product
July 1974	23.6	22.0	3.3	6.9	2.2	34.4
Aug. 1974	22.7	22.2	3.1	6.2	1.8	33.3
Sept.1974	22.1	20.7	2.7	6.0	2.0	31.4
Oct. 1974	25.3	23.9	3.0	4.3	1.2	32.
Nov. 1974	21.0	20.0	1.4	1.8	1.0	24 2
Dec. 1974	13.7	12.1	0.6	1.3	0.4	14.4
Jan. 1975	9.4	9.0	1.2	1.4	0.0	11.6
Feb. 1975	2.9	2.8	0.4	1.3	0.3	4.8
Mar. 1975	10.7	10.3	1.0	1.1	0.6	13.0
Apr. 1975	12.9	12.1	1.8	1.3	0.4	15.6
May 1975	8.9	8.7	2.1	1.3	0.4	12.5
June 1975	11.2	10.4	1.6	1.9	0.8	14.7
July 1975	9.3	8.8	0.3	2.8	1.8	13.7
Aug. 1975	8.4	8.1	0.2	2.8	1.3	12.4
Sept.1975	9.0	8.7	0.6	2.3	0.9	12.5
Oct. 1975	13.4	13.0	0.8	3.9	0.0	17.7
Nov. 1975	10.2	9.8	0.9	4.0	0.6	15.3
Dec. 1975	16.5	15.9	1.7	4.7	0.9	23.2
Jan. 1976	11.5	11.1	2.3	2.6	0.8	16.8
Feb. 1976	13.3	13.2	2.2	1.9	0.7	18.0
Mar. 1976	15.8	15.5	3.0	2.9	1.1	22.5
Apr. 1976	15.2	14.6	3.1	2.2	0.6	20.5
May 1976	16.9	17.1	3.1	2.6	1.1	23.9
June 1976	12.4	12.5	3.2	2.1	0.8	18.6
July 1976	15.3	15.1	2.4	2.7	0.7	20.9
Aug. 1976	15.9	15.8	2.8	2.9	1.3	22.8
Sept.1976	15.3	14.9	3.0	3.1	0.9	21.9
Oct. 1976	16.1	15.8	2.7	2.7	1.0	22.2
Avg. for Last 12 Months	14.5	14.3	2.5	2.9	0.9	20.6

1974 Capacity In Polymerization	
V-10	Shutdown
V-11	100 MM Lb./Yr.
V-12	100 MM Lb./Yr.
D300/400/500/600	175 MM Lb./Yr.
	375 MM Lb./Yr.

The plant considers its design capacity as based upon the above figure.

During late 1974, it became clear that major process alterations would be needed to meet OSHA limitations in all plant areas. After several studies of methods of meeting OSHA requirements and of anticipating EPA regulations, decision was made to significantly change the polymerization reactor facilities. Production capability was temporarily cut in half to permit the changes. The changes were:

1. Permanent shutdown of the 20 reactors in the V-11 facility.

2. Permanent shutdown of the 20 reactors in the V-12 facility.

3. Replacement of the forty small reactors with 4 large reactors.

This program is now in progress. Completion is scheduled for late 1977. The status of plant polymerization will then be:

1977 Capacity In Polymerization	
V-10	Shutdown
V-11	Shutdown
V-12	Shutdown
Replacement Reactors	175 MM Lb./Yr.
D300/400/500/600	175 MM Lb./Yr.
Total	350 MM Lb./Yr.

This mode of unloading railcars continues until as much liquid as possible has been driven with the pressurized vapor from the railcar. Completion of this step is indicated by vapor flow in the liquid unloading line which is visually observed via a sight flow glass.

At this point, the operator lines up to pull vapors from the railcars via the Corken compressors and push these vapors into the bullets. This mode of operation continues until the railcar pressure drops to 10 psig. At this point, unloading is complete. The railcars are isolated, the compressors shutdown and the lines to the railcars disconnected.

The unloading system utilized three Corken compressors and six unloading spots for railcars. The system is capable of transferring 1.5 MM pounds per day of VCM to storage from railcars.

VCM for the sphere is transferred to the reactor area via pumps. The pumps are automatically started and stopped as required to supply the operating area.

The point emission sources of vinyl chloride in the railcar unloading area are identified on Table I.

b) PVC Polymerization

This area of the plant clearly is the major area where emissions can occur. This is also the area which is most specifically regulated within the emission standard.

To simply the discussion of this area of the plant, it is subdivided into three segments.

(i) Reactor Charging System

The reactor charging system consists of those operations and that equipment associated with the filling of the polymerization reactors.

At the full design capacity of the plant, the polymerization facilities will consist of eight reactors. They will be separated into two modules of four reactors each. Each module will have a separate charging system. The operation of each of the two charging systems is identical.

Figure 2 depicts the process flow of the Reactor Charging System.

VCM from the unloading area is batch transferred to the fresh VCM receiver which is large enough for one reactor batch (approximately 60,000 pounds).

Recycled VCM is unreacted monomer which is collected at the end of the reaction process. This material is contained in the recovered VCM receivers. It is batch transferred to the fresh VCM receiver by the recovered VCM pumps. This material is filtered during the transfer. Approximately 10-30% of the VCM charged to the reactor is recycled material.

TABLE 1
POINT SOURCES - VINYL CHLORIDE MONOMER UNLOADING
ABERDEEN PVC PLANT

DESCRIPTION	COVERED BY	REMARKS
1. Unloading Lines	61.65, b, 1	Three lines exist at each of six stations.
2. Rotating Pumps	61.65, b, 3, i	A total of four transfer pumps exist in this area.
3. Reciprocating Compressors	61.65, b, 3, iv	A total of three compressors.
4. Relief Valves	61.65, b, 4	Relief valves on sphere Relief valves on bullets Relief valves on compressors Relief valves on miscellaneous
5. Manual Vents	61.65, b, 5	Three vents - 2 from bullets and one from sphere.
6. Equipment Opening	61.65, b, 6, i and ii	Includes sphere, bullets, pumps, compressors and lines.

The actual charging of the reactor is a completely automated process. Solid state, programable control systems start and stop pumps, open and close valves and control material quantities.

When all safety and operating interlocks are satisfied, the operator pushes a single start switch to initiate the various charge functions. VCM is pumped from the fresh VCM receiver through the charge filters to the reactor. Appropriate quantities of water and suspension agents are added simultaneously. When the selected quantities of these materials are in the reactor, the transfer pumps are stopped and the systems isolated via the programed control system. The reaction initiating agent is then pressured into the reactor with high pressure water.

The point emission sources of vinyl chloride associated with the Reactor Charging System are identified on Table 2.

ii) Polymerization Reactors

Figure 3 illustrates a typical polymerization reactor.

The reaction of vinyl chloride to form PVC resin is carried out in eight, 18,000 gallon polymerization reactors. Each reactor is equipped with an agitator for mixing and a condenser for cooling during the exothermic reaction. Cooling is also supplied to a jacket on the vessel.

As mentioned previously, the plant is now functioning at about 50% of design capacity. Thus only four reactors are now operating. The additional four reactors will become operational late in 1977 when the plant regains the capacity which was temporarily lost when the 40 small reactors were shutdown.

The physical properties of the product of the suspension polymerization are controlled by several factors. Among these are temperature conditions, amount of suspension agent, additives, and conversion. Reactor cleanliness prior to reaction is essential for product quality reasons.

The reactor is first thoroughly cleaned with an extended hot water or hot chemical rinse. All air is then removed from the vessel with steam jet ejectors. The vacuum is then broken with vinyl chloride vapor and the reactor is charged with ingredients as previously described.

The reaction is initiated with a peroxide catalyst. Inert gases, mostly CO_2, accumulate in the top of the reactor and are purged to facilitate temperature control. One sample of resin per batch is withdrawn and examined under a microscope.

The completion of the reaction is signaled by a drop in pressure in the reactor. At a specified condition for each resin grade, a reaction terminating chemical is pressured into the reactor

TABLE 2
POINT SOURCES - REACTOR CHARGING SYSTEM
ABERDEEN PVC PLANT

DESCRIPTION	COVERED BY	REMARKS
1. Press. Control Vent	61.64, c	Vents from reactors, recovery systems, etc. now use this point.
2. Rotating Pumps	61.65, b, 3, i	A total of four pumps
3. Relief Valves	61.65, b, 4	Relief valves on receivers Relief valves on filters Relief valves on miscellaneous
4. Manual Vents	61.65, b, 5	Vents on filters Vents on receivers
5. Equipment Opening	61.65, b, 6, i and ii	Includes receivers, pumps, filters and lines.
6. Samples	61.65, b, 7	Includes three points where samples are obtained.
7. Inprocess Wastewater	61.65, b, 9	Water accumulates in bottom of receivers.

with water. At this point the process of recovering unreacted vinyl chloride and of stripping the reactor contents is initiated.

The monomer recovery system which consists of compressors and vacuum pumps remove unreacted material. Simultaneously steam is injected directly into the reactor contents. The mass in the reactor is heated above the glass transition point of the resin thus releasing most of the vinyl chloride trapped within the resin particle.

At the conclusion of the monomer recovery and slurry stripping operation the contents of the reactor are dropped through a screener and pumped to the blend tanks for eventual drying in the rotary dryers. The reactor now is cycled to the cleaning phase and the process restarted.

The point emission sources of vinyl chloride associated with the polymerization reactors are identified on Table 3.

iii) Monomer Recovery System

The Monomer Recovery System collects, compresses and condenses unreacted vinyl chloride. The vinyl chloride is subsequently reused in the polymerization reactors.

Figure 4 depicts the Monomer Recovery System.

At the initiation of the reactor recovery step, the unreacted vinyl chloride will flow to the Cooler Scrubber. The pressure at the Cooler Scrubber is controlled at less than 40 psig so as to not over pressure the compressors.

The Cooler Scrubber knocks out any entrained resin and condenses water by direct contact during steam stripping. The cooling is facilitated by circulating water through a water cooler exchanger.

A second K. O. Scrubber provides additional cooling and carryover knockout volume prior to the compressors.

During the initial phase of recovery down to a reactor pressure of about 10 psig the compressors operate alone. In the final phase, below 10 psig, the compressors operate in series with vacuum pumps. Both machines are liquid ring sealed with recirculated seal water.

The seal water is separated at the outlet of the compressors in a seal water separator. The water is circulated, with a pump, through a cooler, back to the vacuum pumps and compressors. The recovered VCM vapor exits the separator and flows to the condensers. The condensed VCM flows into a collection tank and then is pumped back to the Recovered VCM Receivers.

TABLE 3
POINT SOURCES - POLYMERIZATION REACTORS
ABERDEEN PVC PLANT

DESCRIPTION	COVERED BY	REMARKS
1. Inerts Vent	61.64, a, 1	Current practice is to vent for 30 sec. 2 times/batch.
2. Reactor Opening Loss	61.64, a, 2	
3. Manual Venting	61.64, a, 3	Plant now follows the guide-line in FR.
4. Stripper Exhaust Gases	61.64, b	Plant has no stripper. Stripping is dccomplished in reactor.
5. Vinyl Chloride In Slurry	61.64, e, 1, ii	Plant now strips the slurry during recovery.
6. Reactor Agitators	61.65, b, 3, v	Plant now has double mechanical seals on agitators.
7. Relief Valves	61.65, b, 4	Reactors now have rupture discs under R. V.'s.
8. Samples	61.65, b, 7	One sample is usually obtained per batch.

Some amount of water is accumulated in the Cooler Scrubber, K. O. Scrubber, and Seal Water Separators. This water is drained off manually or automatically.

The point emission sources of vinyl chloride associated with the Monomer Recovery System are identified on Table 4.

iv) PVC Dryers

Figure 5 shows this part of the plant production process.

The PVC slurry, following reactor recovery and slurry stripping, fall through a Sweco strainer. Oversize material is removed from the product. The slurry is pumped to slurry blend tanks to even out batch to batch polymerization variations.

Slurry is pumped from the blend tanks to one of seven dryer trains. Each train consists of one centrifuge, to produce a wet cake with 25% moisture, and a rotary, direct fired dryer. The dryer uses cocurrent air flow and dries the product to less than 0.3% moisture content. The material is batch conveyed from the dryer to bagging, storage silos or transportation vehicles.

The plant's program to contain VCM will result in these sources not being subject to EPA regulation as the plant will strip slurry to a 400 ppm level in the polymerization reactors.

v) Other

The plant has other processes for manufacture of PVC Compound (85 MM lb./yr.), PVC Dry Blend (40 MM lb./yr.) and plasticizer (40 MM lb./yr.). These processes are downstream operations and will not be relevant to the Vinyl Chloride Emission Standard.

TABLE 4
POINT SOURCES - MONOMER RECOVERY SYSTEM
ABERDEEN PVC PLANT

DESCRIPTION	COVERED BY	REMARKS
1. Monomer Recovery Exhaust Gases	61.64, d	
2. Rotating Pumps	61,65, 3, i1	A total of two pumps in each module.
3. Rotating Compressors	61.65, b, 3, iii	A total of five compressors in each module.
4. Relief Valves	61,65, b, 4	
5. Manual Venting	61.65, b, 5	
6. Equipment Opening	61.65, b, 6, i and ii	

REQUEST FOR WAIVER OF COMPLIANCE

ABERDEEN PVC PLANT

ATTACHMENT B

WEIGHT OF MATERIAL PROCESSED IN LAST 12 MONTHS

REQUEST FOR WAIVER OF COMPLIANCE

ABERDEEN PVC PLANT

ATTACHMENT C

DESCRIPTION OF EXISTING CONTROL EQUIPMENT

The designation of primary and secondary control devices does not appear applicable in this case. The plant, however, has installed and is now operating systems to control emissions from various sources.

1. Reactor Slurry Stripping System

   PVC resin is now steam stripped in the PVC reactors during the reactor recovery step. The slurry is heated to a temperature in excess of 100°C and held for a period of time. The direct injection of 150 psig steam into the slurry is used.

   Prior to starting this procedure the PVC slurry was typically 15000 ppm of vinyl chloride in the resin. Currently our data indicates a value of 360 ppm. Both values are on a dry resin basis. The estimated control efficiency is 97.6%.

2. Reactor Opening Loss

   An indirect effect of steam stripping in the reactors is a reduction of vinyl chloride emitted to the atmosphere as a result of reactor opening. Prior to stripping, the vapor space above the slurry contained essentially 100% vinyl chloride vapor at a pressure of 10 in Hg vacuum. Under stripping conditions, this vapor is displaced to the monomer recovery system with water vapor emanating from the water/PVC slurry. The estimated control efficiency of this procedure is 93.6%.

3. Manual Vent From Reactor

   The reaction process employed in the plant involves condenser cooling for process control. Decomposition of the catalyst and deareation of reactor contents result in O_2, N_2 and CO_2 accumulating on the top of the reactor. This accumulation limits heat transfer. These inerts must be purged off the condenser so that proper process control can be maintained. Previously, this stream was purged to the atmosphere for a period of 60 seconds per batch. Revisions have been made so this stream is directed through an enclosed system to the monomer recovery system. The estimated control efficiency is 100%.

4. Vent Gas Refrigeration

   The inert gases described above, as well as other inert gas sources which result from vessel clearing and vacuum recovery all are now directed to the recovered monomer receivers. Periodically these inerts must be bled off to avoid over pressuring the vessel. Previously, this was done directly to the atmosphere at a vessel pressure of 75 psig. The plant has now installed a vent gas refrigeration unit. This system cools, condenses and collects vinyl chloride from this stream. Estimated control efficiency is greater than 98%.

5. Relief Valve Discharge

   The plant experiences periodic power failures due to severe weather, etc. Typically, two such power outages occur per year. Previously this occasioned the emission of substantial quantities of vinyl chloride

from relief valves on the reactors. The plant has now installed a reaction killing system to stop the reaction so that no emissions occur during power failures. Estimated control efficiency should be 100%.

6. Magnetic Gauges on Railcars
The plant does not use the level devices on the railcars. No emissions occur from this source. In any event, magnetic devices which eliminate emissions are being installed on all railcars in VCM service.

7. Reactor Agitators
All polymerization reactors in vinyl chloride service are equipped with agitators with double mechanical seals.

8. Reactor Relief Valves
All relief valves on the reactors are equipped with rupture disks.

9. Sphere Relief Valves
The two relief valves on the VCM storage sphere are equipped with rupture disks.

10. Process Waste Water Stripping
Water accumulates in the recovery system during the reactor stripping operation. In addition, water accumulates in the recovered monomer receivers and is used for the purpose of vessel clearing. This water contains about 1000 ppm in an unstripped condition. This in process waste water is directed into a stripping tank and stripped to the recovery system with direct injection of steam. Estimated control efficiency is 96%.

ATTACHMENT D

COMPLIANCE PLAN

CONTROL OF VINYL CHLORIDE EMISSIONS

CONTENTS

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

a) Emission Limitation Requirement: Reactor Exhaust Gases

The concentration of vinyl chloride in exhaust gases discharged to the atmosphere from each reactor is not to exceed 10 ppm except as otherwise provided.

Emission Sources Applicable

At full design capacity the plant will have eight operating polymerization reactors, four in each module. These reactors utilize top mounted condensers for reactor cooling. As a result of catalyst decomposition, inerts, mostly CO_2, accumulate in the condenser and must periodically be purged to maintain reactor control.

1. Module No. 1 Reactor Inerts Vent (4)
2. Module No. 2 Reactor Inerts Vent (4)

Compliance Action

These vents were previously purged to the atmosphere. System modifications on Module No. 1 now vent this stream to the RVCM receivers where it is now treated via refrigeration. A similar system will be installed on Module No. 2 prior to resuming this operation. Eventually the emissions from the refrigeration system will be treated via incineration.

Compliance Schedule

The following compliance schedule refers to installation of the inert gas vent collection system. Final compliance will await completion of the incineration project as described in the "General Compliance System" section.

	Module No. 1	Module No. 2
Process Design Completion:	Complete	January, 1976
Mechanical Design Completion:	Complete	April, 1977
Equipment Ordered:	Complete	May, 1977
Installation Initiated:	Complete	April, 1977
Installation Completed:	Complete	December, 1977
Compliance Achieved:	Complete	January, 1978

Interim Control Steps

Module No. 1 now contains this emission source as described above. Module No. 2 will not operate until a similar containment system is in place.

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

c) Emission Limitation Requirement: Manual Vent Discharge

Except for an emergency manual vent valve discharge, there is to be no discharge to the atmosphere from any manual vent valve on a polyvinyl chloride reactor.

Emission Sources Applicable

1. No. 1 Module Reactors (4)
2. No. 2 Module Reactors (4)

Compliance Action

The only normal reactor vent was previously described.

The plant has developed a reaction kill system. This system is completely effective and should prevent emissions in a power failure situation.

Compliance Schedule

None

Interim Control Steps

None

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

d) Emission Limitation Requirement: Exhaust Gas Discharge

The concentration of vinyl chloride in exhaust gases discharged to the atmosphere from mixing, weighing and holding containers in vinyl chloride service are not to exceed 10 ppm.

Emission Sources Applicable

1. Sphere Vent
2. Tank Farm Bullets Vent
3. Recovered VCM Receiver Vent

Compliance Action

The sphere and the tank farm bullets are vented very infrequently. A header system will route these vents to the atmospheric collection system in the tank farm area. From this system the vent gases will be contained by the Emission Recovery System as described in "General Compliance Systems".

All vent gases will be routed to the Recovered VCM Receivers. Here these vapors will be refrigerated to remove as much vinyl chloride as possible. They will then flow on pressure control to the incineration system where final treatment to 10 ppm will occur. The refrigeration system and incineration system are described in "General Compliance Systems".

Compliance Schedule

The following schedule applies to the installation of the vent gas header system. The schedule for incineration is described in "General Compliance Systems".

Process Design Completion:	January 1, 1977
Mechanical Design Completion:	October 1, 1977
Equipment Ordered:	October 1, 1977
Installation Initiated:	October 1, 1977
Installation Completed:	December 1, 1977
Compliance Achieved:	February 1, 1978

Interim Control Steps

The vent gas refrigeration system is in place and operating to reduce emissions.

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

e) Emission Limitation Requirement: Monomer Recovery System

The concentration of vinyl chloride in exhaust gases discharged from each monomer recovery system is not to exceed 10 ppm.

Emission Sources Applicaple

The plant will, at its full operating condition, have three monomer recovery systems:

1. Module No. 1 Recovery System
2. Module No. 2 Recovery System
3. Emission Recovery System

Compliance Action

Any vents from (1) and (2) will discharge into the RVCM receivers. They will subsequently be treated by refrigeration and incineration as described under "General Compliance Systems". The vent from (3) will also be routed to the RVCM receivers in Module No. 1 and will be similarly treated.

Compliance Schedule

The recovery system vents are now routed as described above. No compliance schedule is applicable.

Interim Control Steps

None

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

f) Emission Limitation Requirement: Sources Following Stripper

In plants using stripping technology the weighted average residual vinyl chloride in the resin processed thorugh the stripper may not exceed 400 ppm.

Emission Sources Applicable

The controlled source of emissions in this case is the slurry that exists in the reactor at the end of the recovery steam stripping step.

1. No. 1 Module Reactors (4)
2. No. 2 Module Reactors (4)

Compliance Action

The plant steam strips the reactor slurry in the reactor during the recovery process. 150 psig steam is directly injected into the slurry. The material is heated to a temperature above the glass transition temperature of the resin. The slurry is held at this condition and at a vacuum to remove the vinyl chloride down to the 400 ppm level.

Compliance Schedule

The plant now steam strips each batch. Extensive data indicates a 400 ppm level is usually obtained. Further testing of operating and product quality parameters is now in progress.

	Module No. 1	Module No. 2
Process Design Completion:	February, 1975	January, 1976
Mechanical Design Completion:	March, 1975	April, 1977
Equipment Ordered:	March, 1975	May, 1977
Installation Initiated:	April, 1975	November, 1977
Installation Completed:	October, 1975	December, 1977
Process Development:	Continuing	-
Compliance Achieved:	June, 1977	January, 1978

Interim Control Steps

The plant is usually obtaining the 400 ppm level on each batch. Module No. 2 will not be operated without steam stripping equipment.

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

g) Emission Limitation Requirement: Relief Valve Discharge

Except for an emergency relief discharge there is to be no discharge to the atmosphere from any relief valve on equipment in vinyl chloride service.

Emission Sources Applicable

As required by ASME code and other safety needs all equipment in vinyl chloride service are equipped with relief valves. These valves will only discharge in an emergency.

Compliance Action

None

Compliance Schedule

None

Interim Control Steps

None

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

h) Emission Limitation Requirement: Unloading Lines

Vinyl chloride emissions from unloading lines which are opened after each unloading operation are to be minimized so the quantity of vinyl chloride released from each line is no greater than 0.13 cu. ft. (1 gal.) of vinyl chloride at standard temperature and pressure.

Emission Sources Applicable

The plant has six unloading spots for vinyl chloride railcars. Each spot has three lines which are connected to each railcar and are subject to this provision of the regulation.

Compliance Action

Valves will be installed at the ends of each line. The pressure between the valve on the end of the unloading line and the valve on the railcar will be drawn down by the Emission Recovery System (See "General Compliance Systems") so the amount of VCM released complies with the regulation.

Compliance Source

The following schedule applies only to the revisions to the unloading lines. The Emission Recovery System compliance schedule is included under "General Compliance Systems".

Process Design Completion:	January, 1977
Mechanical Design Completion:	October, 1977
Equipment Ordered:	October, 1977
Installation Initiated:	November, 1977
Installation Completed:	March, 1978
Compliance Achieved:	May, 1978

Interim Control Steps

Existing lines will be evacuated to 10 psig prior to uncoupling.

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

1) Emission Limitation Requirement: Rotating Pump Seals

The emission standard demands that emissions from pump seals on pumps in vinyl chloride service be minimized by installing double mechanical seals. Pressure between seals is to be maintained so leakage is into process. Alternatively, any vinyl chloride between seals can be ducted through a control system.

Emission Sources Applicable

1. Tank Farm Bullet Transfer Pumps (2)
2. Sphere Transfer Pumps (2)
3. No. 1 Module Charge Pumps (2)
4. No. 2 Module Charge Pumps (2)
5. No. 1 Module RVCM Pumps (2)
6. No. 2 Module RVCM Pumps (2)
7. No. 1 Module RVCM Transfer Pumps (2)
8. No. 2 Module RVMC Transfer Pumps (2)

Compliance Action

Double mechanical seals will be installed on the above pumps. The vinyl chloride from items (1) and (2) will be ducted to an atmospheric pressure collection system, a refrigeration system and subsequently an incineration system. The ultimate emission location will be the exhaust gases of the incineration which will not exceed 10 ppm.

The mechanical seals of item (3), (4), (5), (6), (7), and (8) will utilize high pressure water as the sealing fluid. This will mean any leakage will be into the pump.

Compliance Schedule

The compliance schedule for installing this control system is:

	Module No. 1	Module No. 2
Process Design Completion:	December, 1975	January, 1976
Mechanical Design Completion:	September, 1976	April, 1977
Equipment Ordered:	September, 1976	May, 1977
Installation Initiated:	November, 1976	November, 1977
Installation Completed:	August, 1977	December, 1977
Compliance Achieved:	October, 1977	January, 1978

i) **Continued**

Interim Control Steps

No emissions will occur from items (4), (6), or (8) as Module No. 2 will not operate until double mechanical seals have been installed on these items.

1. Continued

6. All emissions will be directed to the RVCM receivers in Module No. 1. These gases will flow through a refrigeration system to remove most of the vinyl chloride. Inerts with any remaining vinyl chloride will be bled to an incinerator system to distruct the vinyl chloride as required to a 10 ppm level.

7. Where possible, the plant will propose calculation procedures, operating conditions, and monitoring procedures to prove compliance.

Section 2 of this compliance plan describes how each source will be contained. Schedules and Interim Control Steps are also indicated.

Section 3 describes the central control systems which will be needed. Schedules and Interim Control Steps are also included.

Section 4 describes the Plant's leak detection program which will be required by the Standard.

The Compliance Plan also includes the Emission Test Program and Analytical Methods which are proposed to prove compliance. These methods are very similar, in most cases, to those included in the EPA's regulation. There are, however, some variations which the Plant requests the EPA accept as equivalent methods under paragraph 61.66. In addition, the plant proposes to delay emission testing to prove compliance till the appropriate time when compliance systems are functional and analytical equipment has been obtained.

ATTACHMENT D

COMPLIANCE PLAN

1. GENERAL DISCUSSION

The requirements to achieve compliance with the VCM emission regulation are very complex. A great number of emission sources must be collected, contained and treated.

Some of the required systems in themselves produce compliance with the regulation. Examples of this are rupture disks under relief valves and double mechanical seals.

A far greater number of required systems involve interaction between equipment and processes. The effectiveness of the reactor inert venting method may, for example, relate to the effectiveness of the water stripping operation. The net effect of these relationships cannot be demonstrated until all systems are operable.

Attached Figure 1 illustrates each emission source in the plant. The interactions of each system are also indicated. Figure 2 illustrates the overall process flow scheme for the plant.

The following actions will be pursued by the plant to achieve compliance with the regulation:

1. Rupture discs will be installed under relief valves.

2. Double mechanical seals will be installed on pumps, compressors and agitators.

3. An Emission Recovery System will be installed. This will collect and route all exhaust and vent gases to the RVCM Receivers:

    a) Unloading Line Vents
    b) Samples
    c) Vessel Vents
    d) Equipment Opening Vents
    e) Water Stripping Emissions
    f) Reactor Inerts Vent

4. A water stripping system (2) will be installed. This will collect waters and strip them to 10 ppm. Water sources which will be collected are:

    a) Recovery System Drains
    b) Receiver Drains
    c) Seal Water Drains
    d) Water Drains From Equipment Opening

5. The reactor slurry will be batch stripped in the reactor to 400 ppm. Direct injection of steam will be used. The reactor will be held at a boiling condition to purge the vapor space with steam to meet the reactor opening requirement.

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

j) Emission Limitation Requirement: Rotating Compressor Seals

The emission standard demands that emissions from rotating compressor seals on compressors in vinyl chloride service be minimized by installing double mechanical seals. Pressure between the seals is to be maintained so leakage is into the process.

Emission Sources Applicable

1. No. 1 Module Vacuum Pumps (2)
2. No. 1 Module Compressors (3)
3. No. 2 Module Vacuum Pumps (2)
4. No. 2 Module Compressors (3)
5. Emission Rec. System Vacuum Pump (1)
6. Emission Rec. System Compressor (2)

Compliance Action

Double mechanical seals will be installed on all of the above items. In all cases, high pressure water will be utilized as the sealing fluid. This will mean that any leakage will be into the process.

Compliance Schedule

The compliance schedule for installing this control system is:

	Module No. 1	Module No. 2
Process Design Completion:	December, 1975	January, 1976
Mechanical Design Completion:	September, 1976	April, 1977
Equipment Ordered:	September, 1976	May, 1977
Installation Initiated:	November, 1976	April, 1977
Installation Completed:	August, 1977	December, 1977
Compliance Achieved:	October, 1977	January, 1978

Interim Control Steps

No emissions will occur from items (3), (4), (5), or (6). These items will not operate until they have been equipped with double mechanical seals.

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

k) Emission Limitation Requirement: Reciprocating Compressors

Vinyl chloride emissions from seals on reciprocating compressors are to be minimized by installing double outboard seals. The vinyl chloride from between the seals is to be ducted to a control system, the emissions from which are not to exceed 10 ppm.

Emission Sources Applicable

1. Unloading Compressors (3)

Compliance Action

The crankcase and the area between the double seal packing will be vented to an atmospheric pressure collection system, a refrigeration system and subsequently an incinerator system. The ultimate emission location will be the exhaust gases of the incinerator which will not exceed 10 ppm.

Emissions will not be controlled until the incinerator system is complete. Present action involves installing the double distance pieces on the compressors. Other steps are the Emission Recovery System and Incinerator system the compliance schedules of which are indicated elsewhere.

Compliance Schedule

The compliance schedule for modifying the compressor crankcases, crankshafts and seals is as follows:

Process Design Completion:	Januay, 1977
Mechanical Design Completion:	October, 1977
Equipment Ordered:	October, 1977
Installation Initiated:	November, 1977
Installation Completed:	March, 1978
Compiance Achieved:	May, 1978

Interim Control Steps

None

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

m) Emission Limitation Requirement: Relief Valve Leakage

Vinyl chloride emissions due to leakage from relief valves on equipment in vinyl chloride service are to be minimized by installing rupture disks under the relief valves or by routing the relief valve discharge into the process.

Emission Sources Applicable

1. Unloading Area Equipment (10)
2. Module No. 1 Equipment (12)
3. Module No. 2 Equipment (12)
4. Module No. 1 Reactors (13)
5. Module No. 2 Reactors (12)

Compliance Action

On each of the above pieces of equipment rupture disks will be installed between the equipment and relief valve to minimize leakage.

Compliance Schedule	Items 1 and 2	Items 3 and 5
Process Design Completion:	January, 1977	January, 1976
Mechanical Design Completion:	July, 1977	April, 1977
Equipment Ordered:	July, 1977	May, 1977
Installation Initiated:	September, 1977	April, 1977
Installation Completed:	November, 1977	December, 1977
Compliance Achieved:	November, 1977	January, 1978

Interim Control Steps

The two relief valves on the sphere in the unloading area now have rupture disks installed. All reactors in Module No. 1 have installed rupture disks. Items (3) and (5) in Module No. 2 will not operate until all rupture disks are in place.

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

1) Emission Limitation Requirement: Agitator Seals

Vinyl chloride emissions from seals on agitators in vinyl chloride services are to be minimized by installing agitators with double mechanical seals. If double mechanical seals are used, the pressure be maintained so any leakage is into the process.

Emission Sources Applicable

1. D-300 Agitator
2. D-400 Agitator
3. D-500 Agitator
4. D-600 Agitator
5. D-701 Agitator
6. D-702 Agitator
7. D-703 Agitator
8. D-704 Agitator

Compliance Action

The above agitators will have double mechanical seals. The seals will utilize an external Duraseal unit. The seal oil pressure will be maintained so that any leakage is into the process.

Compliance Schedule

The compliance schedule for having all reactor agitators equipped with double mechanical seal systems is:

	Module No. 1	Module No. 2
Process Design Completion:	Complete	January, 1976
Mechanical Design Completion:	Complete	April, 1977
Equipment Ordered:	Complete	May, 1977
Installation Initiated:	Complete	April, 1977
Installation Completed:	Complete	December, 1977
Compliance Achieved:	Complete	January, 1978

Interim Control Steps

Items (1), (2), (3), and (4) are now in operation and are in compliance. Items (5), (6), (7), and (8) will not operate until the compliance system is operable.

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

m) Emission Limitation Requirement: Relief Valve Leakage

Vinyl chloride emissions due to leakage from relief valves on equipment in vinyl chloride service are to be minimized by installing rupture disks under the relief valves or by routing the relief valve discharge into the process.

Emission Sources Applicable

1. Unloading Area Equipment (10)
2. Module No. 1 Equipment (12)
3. Module No. 2 Equipment (12)
4. Module No. 1 Reactors (13)
5. Module No. 2 Reactors (12)

Compliance Action

On each of the above pieces of equipment rupture disks will be installed between the equipment and relief valve to minimize leakage.

Compliance Schedule	Items 1 and 2	Items 3 and 5
Process Design Completion:	January, 1977	January, 1976
Mechanical Design Completion:	July, 1977	April, 1977
Equipment Ordered:	July, 1977	May, 1977
Installation Initiated:	September, 1977	April, 1977
Installation Completed:	November, 1977	December, 1977
Compliance Achieved:	November, 1977	January, 1978

Interim Control Steps

The two relief valves on the sphere in the unloading area now have rupture disks installed. All reactors in Module No. 1 have installed rupture disks. Items (3) and (5) in Module No. 2 will not operate until all rupture disks are in place.

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

n) Emission Limitation Requirement: Manual Venting

All gases manually vented from equipment in vinyl chloride service are to be ducted to a control system the concentration of the exhaust gases from which is not to exceed 10 ppm.

Emission Sources Applicable

The sources of potential manual vents were described under d) previously. There are no other manual vents which are normally used in the operation of the plant.

Compliance Action

None

Compliance Schedule

None

Interim Control Steps

None

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

o) Emission Limitation Requirement: Equipment Opening

Vinyl chloride emissions from opening equipment are to be minimized by reducing the vinyl chloride in the equipment to 2.0% or 25 gal. of vinyl chloride at standard temperature and pressure.

Emission Sources Applicable

All equipment in vinyl chloride service is subject to this part of the regulation.

Compliance Action

The plant is installing:

1. A vacuum header to the emission recovery system from all affected equipment.
2. Steam lines to all affected equipment.
3. Water lines to all affected equipment.

Compliance will be achieved by filling the vessels with water, purging them with steam, and evacuation with the Emission Recovery System. Combinations of the above methods may also be used. Actual operation and testing will be required before the most effective method is identified. Eventually, the plant will develop a calculational method to insure that compliance is being obtained on each equipment opening.

Compliance Schedule

The following schedule applies to installation of the vacuum recovery header and to steam and water lines to the equipment involved:

Process Design Completion:	February, 1977
Mechanical Design Completion:	July, 1977
Equipment Ordered:	August, 1977
Installation Initiated:	October, 1977
Installation Completed:	December, 1977
Compliance Achieved:	March, 1978

Interim Control Steps

None

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

p) Emission Limitation Requirement: Samples

Unused portions of samples containing 10% by weight vinyl chloride are to be returned to the process.

Emission Sources Applicable

1. Fresh Monomer Sampling
2. No. 1 Module Charge Monomer Sampling
3. No. 2 Module Charge Monomer Sampling
4. No. 1 Module RVCM Sampling
5. No. 2 Module RVCM Sampling
6. No. 1 Module Reactor Sampling (4)
7. No. 2 Module Reactor Sampling (4)

Compliance Action

In each case above, process sampling systems will be installed. The sample will be circulated through a sampling bomb with the sample being recirculated to the process. The process lines will be evacuated prior to disconnect. Unused portions of samples will be returned to the process.

Compliance Schedule

The compliance schedule for each sampling system installation is as follows:

	Module No. 1	Module No. 2
Process Design Completion:	December, 1975	January, 1976
Mechanical Completion:	December, 1976	April, 1977
Equipment Ordered:	December, 1976	May, 1977
Installation Initiated:	January, 1977	April, 1977
Installation Completed:	April, 1977	December, 1977
Compliance Achieved	May, 1977	January, 1978

Interim Control Steps

Samples will be taken only as absolutely necessary. No routine samples are involved.

ATTACHMENT D

COMPLIANCE PLAN

2. SPECIFIC SOURCE COMPLIANCE

q) Emission Limitation Requirement: In Process Waste Water

The concentration of vinyl chloride in each in process waste water stream containing greater than 10 ppm vinyl chloride is to be reduced to no more than 10 ppm before being exposed to the atmosphere.

Emission Sources Applicable

The following sources of water contain greater than 10 ppm vinyl chloride:

1. No. 1 Module RVCM Receiver Drains (2)
2. No. 2 Module RVCM Receiver Drains (2)
3. No. 1 Module Seal H_2O Sep. Drains (2)
4. No. 2 Module Seal H_2O Sep. Drains (2)
5. No. 1 Module K. O. Drum Drains (2)
6. No. 2 Module K. O. Drum Drains (2)
7. Displacement Steam For Equipment Opening
8. Displacement Water For Equipment Opening

Compliance Action

Each of the above sources of in process waste water will be collected and drained to a vessel in which steam stripping of the water to achieve compliance will occur. There will be two such water stripping systems, one located in each module. Further discussion of the Process Waste Water Stripping is included under General Compliance Systems.

Compliance Schedule

The following schedule applies to installation of the collection system for in process waste water:

	Module No. 1	Module No. 2
Process Design Completion:	Complete	January, 1976
Mechanical Design Completion:	Complete	April, 1977
Equipment Ordered:	Complete	May, 1977
Installation Initiated:	Complete	April, 1977
Installation Completed:	Complete	December, 1977
Process Development:	April, 1977	
Compliance Achieved:	May, 1977	January, 1978

Interim Control Steps

Items No. (1), (3), (5), and (7) are now being collected and stripped in a system as described under "General Compliance Systems". No excessive emissions will occur from items (2), (4), and (6) as Module No. 2 will not operate until its water stripping system is functional.

ATTACHMENT D

COMPLIANCE PLAN

3. GENERAL COMPLIANCE SYSTEMS

The overall plan for achieving compliance with the emission regulations will require four final treatment systems. The specific source and collections systems were indicated in Section 2. The final treatment systems are described on the following pages.

It should be noted that no interim control steps are applicable to these four systems.

ATTACHMENT D

COMPLIANCE PLAN

3. GENERAL COMPLIANCE SYSTEMS

a) Vent Gas Emission Recovery System

Purpose

This system will provide a source of vacuum for various fugitive emission sources. The system will draw these emissions and compress them so they can be contained. The emission will be directed through condenser to the recovered VCM receivers in Module No. 1.

The following sources will not be in compliance until this system is installed:

Tank Farm Pump Seals
Tank Farm Compressor Seals
Unloading Lines
Samples
Equipment Opening
Vessel Vents
Water Stripping

Description

An atmospheric pressure holding tank will be installed at the loading area to collect these vents. The Emission Recovery System will consist of one vacuum pump and two compressors. The machines will be liquid ring type with rouble mechanical seals. It will operate at a suction pressure of 10 in. Hg vacuum and discharge at 75 psig.

Compliance Schedule

Process Design Complete:	January 1, 1977
Mechanical Design Complete:	October 1, 1977
Equipment Ordered:	October 1, 1977
Installation Initiated:	November 1, 1977
Installation Complete:	February 1, 1978
Startup:	March 1, 1978

ATTACHMENT D

COMPLIANCE PLAN

3. GENERAL COMPLIANCE SYSTEM

b) Vent Gas Refrigeration

Purpose

As described earlier, all vents will be directed to the Recovered VCM Receivers in Module No. 1. This point will serve as a collection point for vapor emissions. The Vent Gas Refrigeration will cool this stream to about 10°F thus minimizing any vinyl chloride vented. Note that this subsequent vent will be to an incineration system.

Description

The refrigeration system consists of Knock Back condensers which are installed directly atop of the Recovered VCM Receivers. Cooling is supplied to the condensers via a Freon compressor refrigeration system.

Compliance Schedule

This system was installed in 1975 and is now operable.

ATTACHMENT D

COMPLIANCE PLAN

3. GENERAL COMPLIANCE SYSTEMS

c) Vent Gas Incineration

Purpose

As noted all exhaust and vent gases will be directed to the Recovered VCM Receivers in Module No. 1. These will then be treated via refrigeration. The standard demands treatment to a 10 ppm level. The subsequent outlet vapors will be directed to an incineration unit which will lower the vinyl chloride to the required 10 ppm level. In absolute terms no emission source involving vinyl chloride vapor recovery will be in total compliance until the incinerator system is installed and operating.

Description

The vent gases from the aforementioned refrigeration unit will flow to the treatment area. These will be burned to eliminate the vinyl chloride. The HCL will be scrubbed with H_2O so as to minimize any HCL discharges.

Compliance Schedule

Process Design Complete:	April 1, 1977
Mechanical Design Complete:	December 1, 1977
Equipment Ordered:	January 1, 1978
Installation Initiated:	April 1, 1978
Installation Complete:	May, 15, 1978
Startup:	July 1, 1978

ATTACHMENT D

COMPLIANCE PLAN

3. GENERAL COMPLIANCE SYSTEM

d) Process Water Stripping

Purpose

The emission regulations require that in process waste water be treated to a 10 ppm level prior to discharge. This system will batch strip collected waters to the required 10 ppm level. The waters which will be collected are:

Recovery K. O. Tank Drains
Recovery Seal H_2O Separator Drains
Monomer Receiver Drains
Drains From Equipment Opening

Description

Two water stripping systems will be installed, one in each module. The waters will be stripped with the direct injection of steam into the vessels. Vapors will be collected and contained by the Vent Gas Emission Recovery System.

Compliance Schedule

	Module No. 1	Module No. 2
Process Design Complete:	November, 1975	January, 1976
Mechanical Design Complete:	February, 1976	April, 1977
Equipment Ordered:	February, 1976	May, 1977
Installation Initiated:	February, 1976	April, 1977
Installation Complete:	May, 1976	December, 1977
Startup:	June, 1976	January, 1978

Note: No. 1 system is in place and operable although completion of the Vent Gas Emission Recovery System is needed before the water stripping will be fully effective. Module No. 2 will not operate until this system is installed.

ATTACHMENT D

COMPLIANCE PLAN

4. LEAK DETECTION PROGRAM

The Plant's program for Leak Detection has been developed and previously given to the EPA on December 2, 1976. The same plan, except for correction of typographical errors, is included on the following pages.