REMOTE OPERATED VALVES

We need the ability to activate shutoff valves from a remote location to isolate major vinyl chloride storage and process vessels in the event of an emergency. Presently, four valves are located in critical transfer lines to and from the sphere which can be closed via a switch located outside the sphere dike area. An AFE has been approved to upgrade the capabilities of our remote shutoff valve systems as follows:

1. Replace bonnet mounted "fail as-is" actuators with flange mounted fail closed actuators on existing remote shutoff valves.

2. Upgrade sphere system to include another shutoff valve on the liquid return line from the vapor recovery knock-out pot.

3. Add automatic shutdown of unloading compressors and transfer pumps to remote shutdown switch.

4. Install redundant pressure and level instrumentation on sphere.

5. Install a remote shutdown system to isolate VCM receivers in the process area.

This process design for the above revisions/additions is complete, with the exception of a final review of the impact of a remote shutdown. This final review is expected to be complete by September 15, 1985. Mechanical design and installation planning will immediately follow with a projected three-week duration. We expect installation to begin in October, 1985, with startup of the complete system to be determined by the ability to remove the various systems from operation.

GAS DETECTORS IN THE DRYER AREA

The purpose of this system, which has been installed but not activated, is to alarm and shut down the dryers in the event that a natural gas leak is detected by any one of the three gas monitors located in the vicinity of the dryer gas supply systems. The system was not activated when it was realized that provisions had not been made to compensate within the process for a total dryer shutdown. Our investigation of this situation indicates that the system should be revised such that an alarm will first warn of a gas leak at 5-10% of the lower explosive limit (LEL) to allow for appropriate process adjustments in anticipation of a total dryer shutdown to occur at 40-50% of the LEL. This proposal is subject to a final in-plant review. If approved, we would expect the new system to be operational in November, 1985.

REACTOR RELIEF VALVES

Reactor relief valves are a very critical element of the Aberdeen program to prevent gas releases. Our preventive maintenance program must have as the primary objective the assurance that reactor rupture disks and relief valves will relieve at the proper pressure and, for relief valves, will reset properly to minimize a gas release should it occur.

REACTOR RELIEF VALVES - Continued

A review of our rupture disk program indicates that it is adequate. Rupture disks are changed at least once per year and new rupture disks lots received from the manufacturer are tested for relief at the proper pressure. Our knowledge of and training on installation of rupture disks is state-of-the-art and installed rupture disks are frequently tested when reactors are hydro-tested after maintenance is performed.

As a result of new relief valve performance information acquired through plant testing and industry/manufacturer research, we are now developing a revised relief valve preventive maintenance program. The program will involve some additional plant testing and changes in operating and maintenance philosophy. Our next step will be to develop a new document outlining the elements of the revised program (estimated completion date September 1, 1985). Following in-plant review, a schedule will be established to complete needed in-plant testing. Such testing is expected to require approximately one month. If the proposed new program is approved in September, it will be immediately applied to 300, 400, 500, 600, 741, 742, 743 and 744 reactors. Application to 700 and 745 will follow completion of the remaining in-plant testing.

VIBRATION MONITORING OF CRITICAL EQUIPMENT

We have obtained portable vibration monitoring equipment and have trained engineering and maintenance personnel on its use as part of an overall maintenance improvement program. In addition, we are now routinely monitoring vibration performance on our two high speed centrifugal air compressors. A list of critical equipment in vinyl chloride service will be developed and this equipment placed on a preventive maintenance program by August 1, 1985.

INFRARED SURVEYS OF ELECTRICAL EQUIPMENT

These surveys are conducted yearly. The 1985 survey will be conducted this Fall and emergency electrical generators will be added to a list of equipment checked. Otherwise, this preventive maintenance procedure is adequate.

FIRE TRAINING

In reviewing the plant Emergency Manual (now undergoing revision), we have determined that fire training of maintenance personnel should be expanded to cover all aspects of emergency response. This is the only change warranted in the fire training program.

Ammonia System

The system uses anhydrous ammonia at the waste treatment ponds at a bio-nutrient. The potential for a leak in this area would be from transfer problems, especially during the truck unloading operation, and from mechanical failure. The storage vessel is checked on each on-stream inspection and the relief valve is checked annually. Additional security will be provided in this area by issuing a written safety procedure for truck unloading and instituting a routine leak patrol. The leak patrol will be begin in July, 1985, and the written procedure will be issued by November 1, 1985.

SULFURIC ACID SYSTEM

Sulfuric acid (93%) is used for pH control of the bio-ponds. The acid is stored in an atmospheric tank inside a diked area. The major spill exposure in this area is during truck unloading. A written procedure for this operation will be developed and the plant utility technicians trained on its application by October 1, 1985.

CHLORINE CYLINDERS

Chlorine is stored in two one-ton cylinders in the plant to supply chlorine to the cooling towers. The problem which must be addressed in this system is the potential for a cylinder leak. The cylinders are maintained by the supplier in accordance with guidelines provided by the Chlorine Institute. A leak repair kit approved by the Chlorine Institute is available in the plant for use in chlorine service. A training schedule for use of this kit will be established by September 1, 1985.

PROPANE SYSTEM - TANKS AND VAPORIZERS

The propane system provides emergency boiler fuel backup in the event of natural gas curtailment. The system consists of three bullets, three surge tanks, three vaporizers, three mixers and one transfer pump. When full, the propane system can support plant operation for approximately 3.5 days. In the event of a major leak or problem in the system, the supply of propane can be isolated from the vaporizers with the remotely operated valve in the transfer pump suction line. This valve is controlled via a switch in the boiler room panel. Operation of this valve is checked during the winter months but the testing is not documented. Beginning in September of each year, the propane system is brought on-line by each utility operator as a training exercise.

Our evaluation of the propane system relative to prevention of major leaks or spills is not yet complete. To date, we have identified the following potential problem areas:

1. The electrical equipment associated with the vaporizers is not explosion-proof. This will be investigated further and, if warranted, major revisions will be included in the 1986 Capital Budget.

2. The material construction of the transfer pump is cast iron, which is not routinely approved for liquid propane service.

3. The transfer pump is not shut down when the remote shutoff valve is activated.

4. The remote shut-off valve is located in the header feeding the transfer pump which is common to all bullets.

5. At present, a full port sight glass is located in the truck unloading line which could rupture. We are evaluating our exposure in this area.

PROPANE SYSTEM - TANKS AND VAPORIZERS - Continued

Items which have not yet been investigated relative to the propane system are as follows:

1. Relief valve maintenance

2. Vaporizer operating procedures

In summary, the propane system evaluation was more extensive than anticipated. In order to do justice to this review, completion of our evaluation of the above items is now projected for November 1, 1985.

CATALYST FREEZERS

Existing programs/systems are as follows:

1. Walk-in Freezers:
   a) Equipped with alarms (setpoint - 15°F) that activate local horn and flashing red light.
   b) The Chief Lead Operator checks the temperature recorder and visually inspects the inside of each freezer once/shift (see attached checksheet).

2. Day (Chest Freezers:
   a) Two freezers in each module. Equipped with alarm (setpoint - 15°F) that activate common annunciator card (one card for each module) in the control room.
   b) There is no formal inspection of the day freezers by the A-opertors but they do "conduct" a visual inspection of at least one chest freezer once per charge.

Our plans to upgrade our programs in this area are as follows:

1. An operations preventive maintenance program will be established to verify temperature instrumentation on a weekly basis - estimated completion date October 1, 1985.

2. Dial thermometers will be installed in ethylene glycol solution in each freezer to provide a backup to existing freezer temperature instrumentation - estimated completion date September 1, 1985.

3. All freezer temperatures will be recorded once per shift on an Operations Log Sheet - estimated completion date November 1, 1985.

4. An emergency plan will be developed for response to a freezer malfunction - estimated completion date December 1, 1985.

BLEEDER VALVE PROGRAM

An evaluation of the plant bleeder valve program (designed to ensure that hazardous bleeder valves are plugged/capped) indicates that the written procedure is workable and effective. However, it is not followed. Follow-up programs will be instituted immediately to assure compliance with the plan.

POWER FAILURE PROCEDURES

Power failure procedures were recently updated to reflect recent operating experience and all appropriate personnel were trained on the new procedures. The Aberdeen plant program is adequate in this area.

VCM STORAGE TANKS AND UNLOADING SYSTEMS

In this area, all but remote shutdown capabilities were addressed as these systems were evaluated under "Remote Operated Valves". The evaluation has otherwise indicated that the following items need improvements:

1. The bullets need to be cleared to eliminate the risk that they present. A plan is in progress to clear the bullets. Estimated completion date is January 1, 1986.

2. If the Corken compressors are started up with the flow blocked, the temperature will increase to a dangerous level. Each compressor has a high temperature shutdown switch located on the head of the compressor. Another problem with blocked in compressors is high discharge pressure. Each compressor has a relief valve on the discharge piping. The discharge of the relief valve is routed to T-201. No PM is routinely done on the high temperature switches and the relief valves are not routinely tested. There is also a high pressure shutdown in T-201 that shuts down the compressors when the tank pressure reaches 65 psig. An annual PM of this shutdown is done but is not documented. This PM needs to be documented.

3. During the VCM railcar unloading process, the compressors pull the vapor from the railcar at the end of unloading. If the unloading is left unattended, there is the possibility of pulling a vacuum on the car. Each compressor has a pressure switch on the suction line which shuts down the compressor at 8 psig. No PM is done on this pressure switch.

4. A problem that has occurred in the past has been fires of the drive belts of the compressors. This can occur by compressor lockup or by the belts becoming loose and jumping tracks; this causes friction that starts the fire. The only way currently to catch this problem is to periodically check the area during the unloading and institute a belt PM program.

VCM STORAGE TANKS AND UNLOADING SYSTEMS - Continued

5. Chocks are used during unloading to prevent a movement of the railcar. Due to the failure of a railcar's brakes in March, 1984, a redesigned chock is being tested. The testing and utilization needs to be completed.

6. A grounding system is used to eliminate static charges during unloading. The grounding network is on a PM schedule that is currently up-to-date. A problem does exist with grounding cables that connect the rails together. The current method of connecting the cables, cad welding, is continually breaking loose. A new method of drilling holes in the rails and bolting the cables is to be used. This procedure has not been instituted.

7. The VCM transfer pumps at the sphere are not now on a routine operational inspection program. These pumps will be checked once per shift and documented.

All improved preventive maintenance and operational inspection programs will be in place and documented by January 1, 1985. Quotations for purchase of new chocks of the improved design will be obtained by September 15, 1985. A manufacturer will be selected and new chocks ordered by October 1, 1985. The grounding system improvements (bolting groundwires to rails) will be completed by October 1, 1985.

MECHANICAL SEAL SYSTEMS

Existing operational programs are as follows:

1. Reactor Agitator Seals

   a) Every batch - An A-operator checks dura-seal oil level and pressure, lip seal flow rate, and lip seal pressure and radios this information to the Lead Operator who then records it on the batch sheet (copy attached).

   b) Every four hours - An A-operator checks seals oil pressure and flow, lip seal pressure and flow and records it on log sheet (copy attached).

2. FVCM and RVCM Charge Pumps, Recovery System Vacuum Pumps & Compressors

   a) New Module - An A-operator checks mechanical seal water flow and pressure twice per shift and records it on log sheet (copy attached).

   b) The Chief Lead Operator also checks these seals for leakage/abnormalities at the beginning of each shift and records it on a log sheet (copy attached).

A

MECHANICAL SEALS SYSTEMS - Continued

b) Old Module - An A-operator is supposed to monitor the recovery system at least once per shift. The mechanical seal water flow and pressure are not recorded. (A copy of the recovery system checklist is attached).

The Chief Lead Operator checks these seals for leakage/abnormalities at the beginning of each shift and records it on a log sheet (copy attached).

3. Emission Recovery System - Old module A-operator checks the mechanical seal water flow and pressure once per shift and records it on a log sheet (copy attached).

4. Sphere VCM Transfer Pumps - Currently, there is no established program for checking the mechanical seals on these pumps.

Our plans for improving the program on mechanical seals is as follows:

1. Reactor Agitator Seals - The information required on the existing log sheets is adequate. However, most vinyl operations personnel possess a weak knowledge of how mechanical seal systems work and how to troubleshoot them. Operator training will be conducted.

2. FVCM and RVCM Charge Pumps, Recovery System Vacuum Pumps and Compressors

New Module - existing log sheets are adequate.

Old Module - An A-operator checklist to the one used in the new module will be developed.

3. Emission Recovery System - The existing log sheet will be included in the A-operator checklist recommended for the old module.

4. Sphere VCM Transfer Pumps - A program for checking the condition of the mechanical seals on these pumps will be established. The Chief Lead Operators will be assigned this responsibility.

All improvements in the mechanical seal area will be completed by January 1, 1986.

INCINERATORS

Existing programs planned or in-place are as follows:

1. Incinerator/Scrubber Data Log. This check sheet (copy attached) is filled out by Vinyl every day. The panel operators fill in the top half of the log sheet and the Chief Lead Operators fill in the bottom half (the field data). The deficiencies of this log sheet are:

INCINERATORS - Continued

a) It includes no information/action steps for the liquid seal flame arrestor.

b) There is no routine check of the setpoint of the pressure controller on the inert vent line from the receivers.

c) The sheet has not been revised to include the incinerator feed GC data (O_2 and VCM concentration).

2. Maintenance is developing a PM program to routinely check the alarms for proper operation.

3. Lead Operator knowledge of the incinerator/flame arrestor and alarms is generally weak.

4. The downcomer water spray nozzles are checked for pluggage on the second and fourth Sunday of every Monday.

Needed improvements are as follows:

1. Revise/update the incinerator log sheet to include the liquid seal flame arrestor, inert vent pressure controller, and incinerator GC data.

2. In addition to the maintenance alarm PM, operators should develop and alarm PM program where we actually adjust operating conditions to check the alarms [for example, cut back on the water flow to the scrubber (with the firebox down) until we get the low flow alarm]. The maintenance/operations alarm PM could be conducted simultaneously.

3. A refresher training program should be conducted for all Vinyl personnel (Shift Supervisors, Chief Lead, Lead Operators, and A-operators). The training program should focus primarily on instrumentation/alarms and now to respond to problem conditions (examples - alarms, black smoke at incinerator, HCI leak, start-up and shutdown procedures.

4. A PM program should be established to open and inspect the internals of the liquid arrestor on at least an annual basis.

All improvements will be instituted by December 1, 1985.