Air Products

RECEIVED AUG 26 1980 MEDICAL DEPT.

Date 27 August 1980

INTEROFFICE MEMORANDUM

Subject Company Medical Audit

Audit No. 80-244

To L. B. Tepper — Corporate Medical (Location, Organization, or Department)

From R. E. Bennett — Internal Audit (Location, Organization, or Department)

cc: J. J. Baliker, J. T. Barr, A. D. Bizzarro, M. R. Chmura, D. H. Davies, R. E. Jones, A. H. Kaplan, G. E. Maurer, J. F. Posch, R. H. Schenck

Attached is the report resulting from our Company Medical Audit.

In accordance with standard practices, we ask that you respond to the recommendations of this report in writing within thirty days indicating actions taken, actions planned and expected dates of completion.

R E Bennett

REB:pmg

Attachment

(320)

Air Products

AUDIT NO. 80-244

AUDIT REPORT

TO L. B. Tepper

DATE 27 August 1980

FROM R. E. Bennett

COPIES TO J. J. Baliker
J. T. Barr
A. D. Bizzarro
M. R. Chmura
D. H. Davies
R. E. Jones
A. H. Kaplan
G. E. Maurer
J. F. Posch
R. H. Schenck

AUDIT OF Company Medical Audit

BY R. R. Brown

I. Introduction and Scope

The Internal Audit department recently completed a corporate medical and chemicals manufacturing operational audit dealing with OSHA compliance to vinyl chloride monomer (VCM) requirements at our polyvinyl chloride (PVC) plants. Our objectives were to:

1. Determine the extent of company compliance to OSHA requirements.
2. Evaluate the administration of the company medical programs relating to VCM.
3. Evaluate the effectiveness of the computerized systems which support our plant and medical staffs.
4. Evaluate the administration of VCM controls at our plant locations (Calvert City and Escambia).

II. Summary

While our audit revealed no OSHA violations at either plant, it is our opinion that certain existing conditions potentially could lead to inaccurate record keeping and erroneous management decisions. Specifically, the conditions noted were:

1. The medical procedures for VCM are not being applied uniformly at our PVC locations.

FORM 2100 (REV. 9/75)

2. The computerized medical system which tracks medical data, physical scheduling, VCM exposures, etc. is not being fully utilized by PVC field locations.

3. A common interpretation of the OSHA requirements for VCM does not exist among all areas involved in overseeing PVC operations.

III. Detailed Audit Findings and Recommendations

As a result of our review of the administration of our medical surveillance program at our PVC plants, we found that:

A. Medical procedures are not being applied uniformly at our PVC locations.

1. There are no specific company policies or procedures indicating when construction physicals are to be given or who should be getting them at our PVC plants. As a result, plant medical personnel are not sure all required physicals are being administered.

2. The format of the medical exam given to construction employees is different at our two plants. Calvert City uses several of the forms that are used for our own employees. Escambia uses a one page physical exam form, specifically designed for construction employees.

3. Calvert City performs 5-liver function tests for VCM; Escambia performs 6 (OSHA requires 5).

4. The grounds for medically declaring someone unfit for VCM work are different. At Calvert City, any two abnormalities in the 5-liver tests constitutes unfitness. At Escambia, one abnormality in the 6-liver tests constitutes unfitness for VCM work.

5. The follow-up physicals for liver test abnormalities are different. Calvert City re-tests only the abnormal test(s); Escambia re-tests all of the 6-liver function tests and re-tests the person every six months for a period of 18 months.

6. Medical record retention is different. Calvert City maintains MID input forms, lab tests, physician's statements of fitness, and associated computer output. Escambia discards everything except lab tests and computer output.

7. For terminations, Calvert City retains the medical files. At Escambia, the medical files for terminations are forwarded to the Corporate Medical Department in Trexlertown.

Recommendations

Because of the above inconsistencies, we recommend the following:

1. The corporate medical department should establish and communicate to the field uniform standards for the following areas at all our plants:

   - Guidelines on which construction employees will be placed under our medical surveillance program and when they will receive abbreviated physicals.

   - The format of construction physicals including forms to be used, scheduling of exams, and follow-up testing to be conducted.

   - Guidelines on liver tests to be conducted, criteria for declaring an employee unfit and follow-up testing for company employees.

   - Retention requirements for medical records by the plant for employees and contractors. Also, disposition instructions for files of terminated employees.

B. The existing medical information systems are not being efficiently utilized.

1. The medical exam scheduling list (report A3C220) can not be used at either plant because it contains inaccuracies relating to the current listing of persons requiring physicals. The inaccuracies are not the result of any systems failure, but rather are due to incomplete data input and file maintenance. For example:

   - 33 of 49 current PVC plant employees at Escambia do not appear on this report.

   - 43 of 182 total persons listed on the report for Escambia have terminated.

   - 8 of 149 total persons listed on the report for Calvert City have terminated.

2. The RAMADS system report (A3C505), which lists persons who entered a restricted area and whether they were/or were not authorized to do so is missing 50% of its total data because Calvert City no longer fills out the input form (regulated

area access log-form 5583) which provides the data for this report. The remaining 50% of the report is currently being generated for Escambia since they still submit the input form (5583) to MID.

3. The VCM monitoring/exposure report (A3C130) is incomplete because Calvert City forwards the input forms (form 5576) to Trexlertown before all the required information has been put on the form (i.e., respirator usage and type).

4. The medical system reports do not include current contractor physicals. The medical exam scheduling list (report A3C220) shows 18 construction people at Calvert City. However, Calvert's plant medical department has 53 contractors who have received VCM physicals as of May, 1980. Escambia's exam scheduling list shows no contractor physicals.

Recommendations

Since extensive amounts of data are either missing or incomplete in the medical systems data base, the exposure exists that all the medical system reports are inaccurate, and thus we recommend:

1. With the assistance of MID, all reports from the medical system should be reviewed by the appropriate level of management to determine if their continuance is warranted in their present state.

2. Steps should be taken to upgrade the completeness and accuracy of the medical systems data bases.

3. The medical system users should determine if they need the RAMADS system report (A3C505).

4. The appropriate level of management should determine if contractor physical information is to be maintained on the medical system.

C. Area monitoring controls are not applied uniformly at our PVC locations.

1. The existing PVC area at Calvert City was designed to operate as a non-regulated area, and as a result, people are entering the PVC area without signing a regulated area access log or being monitored for medical clearance to enter the PVC plant. However, based on personnel monitoring data reviewed, indications are that VCM in excess of the permissible exposure

limit (1 ppm in 8 hours - time weighted average or 5 ppm in 15 minutes - time weighted average), is being experienced in certain parts of the Calvert City plant and thus those areas should be regulated. At Escambia, the PVC area is regulated and the access log is still used. Also, a fence surrounds the PVC area at Escambia. Calvert City has no barrier surrounding their PVC area.

2. Area monitoring is required per the OSHA vinyl chloride standard-29 CFR 1910.1017 (g) (6) (ii). At Escambia, area monitoring readings are taken every 15 minutes by gas chromatographs. The readings are recorded on strip charts and are also evaluated and documented immediately by a minicomputer. At Calvert City, the gas chromatographs take readings every 20 minutes. However, the readings that appear on the strip charts are not evaluated until the following day. Calvert City's minicomputer could be used to perform this task with greater speed and efficiency but is currently not in use.

Recommendations

Because of the above inconsistencies, we recommend the following:

1. Those areas at Calvert City that have exhibited exposure readings in excess of permissable limits should be identified in order that appropriate measures can be taken to restrict access to such areas to authorized personnel only. Also, other appropriate access controls should be reinstituted.

2. The appropriate level of management should determine how area monitoring is to be handled (i.e., manually or computerized) and develop a plan to accomplish such monitoring. Such a plan should be coordinated between plant and support groups to ensure that it will adequately address OSHA requirements for VCM area monitoring.

All of the assistance provided by chemicals manufacturing, corporate medical, legal, and the plant staffs at Escambia and Calvert City was very helpful and greatly appreciated.

cc: R. E. Davis
B. D. Helms
J. W. Gentile
J. C. Novak
H. J. Smith
E. K. McIntyre

CALVERT CITY PVC PLANT GROUP SAFETY ASSISTANCE
ACTIVE PROJECTS STATUS REPORT
AS OF ~~14~~ 31 MARCH 1980

PROJECT NUMBER	PROJECT TITLE	RESPONSIBILITY	TARGET DATE	RECOMMENDATIONS/ACTIONS TAKEN/STATUS
1*	Self-contained Breathing Air for lab use during collection of VCM gas and liquid samples.	W. H. Stermon	03/28/80	2 Scott Sling-Pak IIA's or equivalent and breathing air tank refilling station recommended by H. J. Smith on 2/22/80. Not ordered as of 2/28 since air line resp. hook-ups to be installed. JWG recommended purchase anyway since this would give lab flexibility if other areas become identified for additional sampling. CE written by Stermon. Approved through Bob Lomicky as of 3/11/80. SLING-PAK IIA'S ORDERED AND BREATHING AIR LINES IN PLACE.
2*	Requirement for personal protective equipment by all persons in/around collection of VCM gas and liquid samples.	W. H. Stermon	03/29/80	Respiratory protection (Project No. 1 above) plus impervious gloves and impervious coat or jacket recommended by H. J. Smith on 2/22/80. Procedures not fully implemented as judged by observation of VCM rec. mon. sampling and seal water sampling techniques on 2/26/80. Gloves and coat in use but not respiratory protection. CE written by Stermon and approved through Bob Lomicky for respiratory protection as of 3/11/80. NO CHANGE IN STATUS AFTER 3/31/80.
3*	Respiratory Protection Program for laboratory.	W. H. Stermon	03/29/80	Program to satisfy OSHA 29 CFR 1910.134 requirements recommended by H. J. Smith on 2/22/80. Training session conducted on 2/28 by J. W. Gentile. Agreed to purchase 2 Sling-Pak IIA's, establish cleaning, inspection and storage procedures. As of 3/11/80, cleaning, inspection and storage procedures to be implemented upon receipt of the Sling-Pak IIA's. NO CHANGE IN STATUS AFTER 3/31/80.
4	Use of Lab Hood.	W. H. Stermon	04/01/80	VCM sample preparation and pH analyses recommended to be performed inside the hood by H. J. Smith on 2/22/80. Sample prep. and pH analyses confined to hood as of 2/27. Liquid sampling valve for GC on order. Valve to be received and in use by 4/1/80. VALVE NOT RECEIVED AS OF 3/31/80. SPECIAL PROBE TO MEASURE pH OUTSIDE HOOD FOR VCM USE WHICH WILL STAY IN THE HOOD.

* These items (1, 2, 3) were to require temporary suspension (Not done).

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ACTIVE PROJECTS STATUS REPORT
AS OF 14 MARCH 1980

PROJECT NUMBER	PROJECT TITLE	RESPONSIBILITY	TARGET DATE	RECOMMENDATIONS/ACTIONS TAKEN/STATUS
5	Upgrade of Lab Hood.	W. H. Sermon	A. 03/28/80	A. H. J. Smith recommended the following on 2/22/80: provide 125 fpm minimum face velocity with sash fully open via higher capacity fan, air volume to be reduced to 1,000 CFM (approx.) via sash half open; makeup air to be provided.
			B. 02/29/80	B. In interim: thoroughly clean/repair; adjust upper and lower plenum slots so that they are 3/4 closed; block off bypass grating above the sash and lower portion of hood (between sill and shelf), leaving the space below the sill open; reduce face opening to 2.5 square feet by reducing width via plexiglass panels. Completed.
			C. 04/25/80	C. J. W. Gentile recommended replacement of blower motor with an explosion-proof model. W.O. for maintenance or engineering evaluation to be written by R. J. Lomicky on 2/29. As of 3/11/80, engineering evaluation completed. Replacement motor to be purchased and installed. [illegible]
			D. 03/13/80	D. J. W. Gentile recommended purchase of a Dwyer vaneometer or equivalent for routine monitoring of lab hood performance on 2/26/80. Purchase requisition written on 2/27/80. P.O. issued on 3/3/80. Dwyer vaneometer received on 3/13/80. Checked out. Functions O.K. Completed.
6	VCM Gas Sampling	P. P. Aquila	03/14/80	Stainless steel cylinders (one end to sample valve, other end to closed system), tubing connections as short as possible, gas holder sample connected to fugitive emissions system, 4 gas sampling points in mon. rec. system connected to knock-out pot, sampling points to be more accessible, all recommended by H. J. Smith on 2/22/80. Cylinders received 3/7/80. In use by 3/14/80.
7	Works-Wide Clearance Work Permit Procedure	R. E. Davis	03/24/80	Procedure drafted, reviewed and signed off by E. K. McIntyre and J. J. Baliker on 2/25/80. Training sessions to explain began on 2/26/80. C.C. Safety Dept. to obtain rubber stamps in order to implement. Target date is dependent upon receipt and distribution of the stamp.

CALVERT CITY PVC PLANT GROUP SAFETY ASSISTANCE
ACTIVE PROJECTS STATUS REPORT
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PROJECT NUMBER	PROJECT TITLE	RESPONSIBILITY	TARGET DATE	RECOMMENDATIONS/ACTIONS TAKEN/STATUS
8	Leak Patrol Program	A. F. Cantor	A. 04/11/80	A. Program reviewed and walk-throughs made with John Powell by HJS week of 2/18 and JWG week of 2/25. S. Brunswick Leak Patrol Program and reporting reviewed with Powell on 2/26 by JWG. Leak patrol area and point measurements recorded during 2/27 patrol. Revised program similar to S.B.'s presented to Lou Toney and Boyce Helms on 3/11/80. Lou Toney and Joe Gentile to revise and reissue by 4/1/80.
			B. 03/24/80	B. Authority to order resp. prot. use and evacuation or radio commo. w/supervision and immediate follow-up recommended to Dick Davis by JWG on 2/29.
9	VCM Regulated Area	A. F. Cantor	04/21/80	Based on evaluation of leak patrol data and walk-throughs during leak patrols, JWG conducted a survey on 2/28 with Duane Hawes, Safety Supervisor, for the purpose of defining boundaries/control actions. Yellow chain and posts and their positioning outlined for Hawes. A plot plan with the boundary indicated needs to be presented to Cantor/Helms so that agreement can be obtained. Ponds on south side of plant and construction access road need to be addressed. As of 3/13/80, Works management decided to discontinue the use of the Sagalin (access) roster and enforcement of the "45 minute rule" until area personnel monitoring indicate the need. Evaluation to be made monthly beginning 4/21/80.
10	Catalyst Freezer Room	A. F. Cantor	04/07/80	Door tied open with tube-turn closure O-rings. Identified by JCN/HJS during week of 2/18. Status the same as observed by JWG week of 2/25. Recommendation to Cantor from JWG on 2/29 to strictly prohibit and posting of signs on both sides of door to inform employees to "Keep Door Closed". O-ring removed by 3/10/80. Temporary sign placed on door by Duane Hawes. Frank Saul to order permanent signs.

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PROJECT NUMBER	PROJECT TITLE	RESPONSIBILITY	TARGET DATE	RECOMMENDATIONS/ACTIONS TAKEN/STATUS
11	Red Warning Lights in Poly. Building	A. F. Cantor	03/07/80	Plant inspections made by HJS during week of 2/18 discovered lights (3) blocked by transite siding (installed for freeze protection). JWG recommended to Cantor on 2/29 to relocate lights or remove siding. Lights visible as of 3/11/80. Completed.
12	Laboratory Sampling in Remote Areas of Plant	W. H. Stermon	04/07/80	Need for portable light source and radio identified at 2/28 resp. prot. safety training session. JWG recommended to Stermon to support his request for these items. As of 3/11/80, explosion-proof flashlight in use. CE written by Stermon for radio. CE approved through Bob Lomicky. Radio to be received through Harold Oglesby.
13	Lockouts of Switches in MCC East of the Poly. Bldg.	R. E. Davis	A. 03/24/80 - meetings B. 04/24/80 - corrective action	During observations made by JWG week of 2/25 noticed attachments for locks, some of which were bent. Recommended to Davis that he review with operating and maintenance personnel and take corrective action which might include modifications to attachments so they can't be bent. Also, strong discipline will be needed to demonstrate management's commitment.
14	Additional Sampling Points	R. E. Davis	03/21/80	Laboratory technician sampling of seal water of Nash Compressor from the monomer decanter and from recycle pump for recovered monomer observed by JWG during week of 2/25. Recommendations to Davis on 2/29 for: closed system loop, lighting and check of electrical bonding/grounding at recycle pump sampling point; closed system loop at seal water sampling point. Sketches completed 3/3/80. W.O. for Nash Compressors issued by 3/4/80. Work initiated on recovered monomer sample; however, unsatisfactory as of 3/10/80. JWG reviewed with Bob Hall. Hall agreed to: ensure lighting is provided, ground plastic lines or replace with stainless steel, number valves, draft a valve use procedure. Modifications to the seal water point completed as of 3/14/80.

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AS OF 14 MARCH 1980

PROJECT NUMBER	PROJECT TITLE	RESPONSIBILITY	TARGET DATE	RECOMMENDATIONS/ACTIONS TAKEN/STATUS
15	Chromatograph/ Computer Use.	A. F. Cantor	09/01/80	During weeks of 2/18 and 2/15/80, it was observed that the chromatograph and alarm system does not function effectively. For example, several (if not all) lights come on when only one should. Also, no time-weighted average nor peak concentrations per point are being determined. As of 3/7/80 a CE was drafted for a system to alarm (one point at a time) at 1 ppm and 1,000 ppm with computer analysis for calculation of TWA's and peak concentrations. Need verbally confirmed by Dick Fleming during his 2/29-3/1 visit. In interim, woman hired by Boyce Helms to perform manual computations. To begin work week of 3/17/80. [illegible]
16	VCM Canister	A. F. Cantor		On 3/11/80 JWG recommended the following to Bob Hall:
			A. 3/21/80	A. Strategically locate NIOSH-approved canister gas masks throughout the plant for work in areas above 1 ppm but still on-scale on the chromatograph (10 ppm max.) since the canisters are good for exposures not exceeding 25 ppm. [illegible]
			B. 3/23/80	B. Require all users to turn in the canisters immediately after use to their shift foreman who should immediately replace any used canisters. [illegible]
			C. 04/13/80	C. Establish periodic inspections to insure the canisters and face pieces and hoses are maintained in a sanitary, serviceable condition and are located in their designated locations. [illegible]
			D. 03/21/80	D. Conduct training for all potential users in the capabilities, limitations, conditions of use, and maintenance of the canister gas masks. [illegible]
				On 3/12/80 JWG recommended the following to Tony Carter:
			E. 03/24/80	E. Improve housekeeping in the respirator storage shed west of the maintenance shop. Aisleways are not maintained and stock is very difficult to locate. [illegible]

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PROJECT NUMBER	PROJECT TITLE	RESPONSIBILITY	TARGET DATE	RECOMMENDATIONS/ACTIONS TAKEN/STATUS
			F. 03/25/80	F. Determine the expected usage rate for the VCM gas mask canisters and order/establish a reorder frequency (purchase information can be obtained from plant safety department). [illegible]
17	SHWPS on Vinyl Chloride	A. F. Cantor	06/15/80	Group safety drafted and reviewed with B. D. Helms and R. E. Davis on 3/12/80. Format to be revised, procedures more specific, and safety procedures added with reissue, as revised draft, scheduled for 4/1/80.
18	Process Area Fire Water Deluge System	A. F. Cantor	03/21/80	Deluge system selector and alarm switches observed in "off" position at various times during week of 3/10/80. JWG recommended to A. F. Cantor: a) enclose the selector and alarm switches in plexiglass, hinged, lockable enclosures and b) lock the enclosures, keeping the key under Cantor's control. Note: Switches should be in the "auto" and "on" positions always unless authorized otherwise by Cantor. [illegible]
19	DMF Cleaning (Final Rinse Water Handling)	A. F. Cantor	03/21/80	JWG reviewed unnecessary release of DMF and VCM during draining of hot DMF final rinse water to sewer with Cantor and Szulczewski on 3/13/80. W.O. written to install Camlock fittings with flex-hose to sewer on all 6" drain (dump) valves JV-1123 through JV-1423. [illegible]

Not done: Analysis of VCM releases?

Carol Smith
Use of Portable FID GC? Interested gen to deliver 3/3
"C.E. Sfty "Help"

Air Products

P.O. BOX 538
ALLENTOWN, PA. 18105
PHONE: 215-398-4911

from the desk of

Joseph W. Gentile

Transfer Info.
~~Audit Guide~~
~~Mock OSHA Visit~~
- VCM SHWPS
- Boehler (Rec.)

Wk.	Resp.	Goal
2/18 Done	JCN / HJJ	Fact finding rules; Unsafe Acts - STOP - permits; Immediate F/U; Hard Hats w/ names / function; Procedures
2/25	JWG	
3/3	JCN	
3/10	HJJ or (JWG)	
Europe 20	?	

~~Investigate~~
Switch fear - MCC
Pasteurized?
Don't think so (NO)
~~2/17 Training~~ - Table top. Postponed to 3/3/80
Fatigue / Retaining / Hardhat / Seal / Accurate

"Piss up a rope" - JJB & AKMcM. Agreement w/ DTR.
RF - priorities

Consistency - little duplication - F/U

cc/US — (Define problem) time to solve
Davis / Helms - specialized involvement
problem defined → 6 wk. goals
OSHA fear

US — How

(7:30 AM 11:00? House, 2/23) (Sat. luncheon mtgs.) - traveler to pay

Use of my "LP 81/2" equiv. pads - plant eng. exchange

~~Dictaphone for HJJ?~~

Reasons to come home / (Sec. help? w/ cap. of transcribing Office / telephone?)

Conflicts: Formaldehyde - SB audit scheduling - St. Gabriel
Edict (RF)

AP00031421

Calvert City
Formaldehyde
MNB Plant
Paulsboro Centrifuge - Z Purging
Safety Enforcement Mtg.
Nannette - O.T.