GEN 55 (REV.6

Interoffice Memorandum

File

TO (Name and Location)	DATE
Mr. R. C. Reitz	June 22, 1976
FROM (Name and Location)	REFERENCE NO.
C. J. Duey	CJD-200-76

Subject: Mid-Year OSHA Review - Air Contaminants in Work Place

Major emphasis has been put on measuring employee exposure to methanol vapors in the Nylon Salt Unit. Jill Luppes is making a weekly measurement of the outside B Operators' exposure. All results obtained to date are shown in Table I. Recent samples show less exposure. This is partly a result of operator awareness (move back when odor is noted) and better housekeeping (discharge chutes covered and on tight). We may still have high exposures during unusual conditions (startup, shutdown, strike washouts, etc.).

Only one sample has been taken on a Mechanic working on a salt centrifuge. The exposure was very high at 2380 ppm. This measurement will be repeated at the first opportunity; an air blower will be used to provide ventilation for the Mechanic. Hopefully, this will greatly reduce the exposure.

A rough draft (CJD-197-76) of the Bay City method for measuring methanol vapors was sent to B. J. Bland to share with the other Chemical Company locations.

Hexamethyleneimine (HMI) is loaded hot into tank cars or trucks. HMI vapors escape from the hatch during the loading. Air near the hatch opening contained 700 ppm HMI. Air near the breathing zone of the loader contained 80 to 100 ppm HMI. OSHA has not set a TLV for HMI, but 100 ppm is surely too high. Mr. D. L. Schuetz has recommended a heat exchanger to cool the HMI before loading (DLS-25). This will reduce the HMI vapors to about 10 ppm in the breathing zone. Several amines have TLV's at or near 10 ppm and this may be adequate.

A sample of HMI has been sent to an outside laboratory for mutagenacity testing. The results of this test will be used to decide if additional testing is necessary. Inhalation studies required to establish a TLV would cost about $18M.

A meeting was held at Bay City on May 27th to prepare a plan for measuring all possible air contaminants in the work place by July, 1977. Most of the plan is reported in CJD-198-76. A plan for Maintenance and Laboratory employees will be developed at a later meeting to be held in July.

C. J. Duey

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cc: Messrs. P. E. Hime
D. H. Miller
J. N. Gann
J. L. White
J. I. Luppes
J. M. Ramey - NYO
B. J. Bland - CCCTC
Central Files - "

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Table I

EMPLOYEE EXPOSURE TO METHANOL VAPORS

Date	Employee	Total Sample Time, Minutes	ppm MeOH, TWA
10-29-75	Bennie Kainer	369	91
11-5-75	Joe Cox	425	26
12-4-75	Craig Eversole	427	93
2-20-76	Kenneth Tyler	325	398
2-24-76	Craig Eversole	355	725
3-2-76	John Marek	386	76
4-22-76	Dan Barosh	347	81
4-30-76	David Carrol	293	345
5-10-76	Kenneth Tyler	302	476
5-17-76	Thomas Orsak (Maintenance)	107	2380
5-20-76	Craig Eversole	242	26
5-26-76	John Marek	290	29
6-3-76	Robert Gatica	315	16
6-10-76	Kenneth Tyler	360	14

GEN 55 (REV.6/7

teroffice Memorandum

(Name and Location)	DATE
Mr. J. N. Gann	June 8, 1976
FROM (Name and Location)	REFERENCE NO.
C. J. Duey	CJD-198-76

Meeting on Air Contaminants
in the Work Place

On May 27, 1976 a meeting was held to develop a plan for measuring all airborne contaminants in the work place. Those present for all the meeting were J. M. Ramey, C. H. Laubly, B. J. Bland, R. C. Reitz, J. N. Gann, and C. J. Duey. Those present for specific areas were J. P. Pirtle, E. E. Abels, J. I. Luppes, J. G. Forister, F. B. Ideus, C. C. Riggs, C. J. Brugger, S. C. Dalton, J. C. Susil, and C. D. Bartine.

Mr. Ramey explained that the company objective is to measure employee exposure to all airborne contaminants. The measurements should include the following employee samples:

1. The Operator with the greatest exposure.

2. A Mechanic during turnaround or other maintenance.

3. An Operator during upset conditions.

These measurements are to be completed by July 1, 1977.

The accomplishment of this objective will cost considerably more than previously estimated for a SOCMA questionaire (CJD-190-76). The SOCMA survey excluded certain chemicals (methanol and ammonia) and also excluded all chemicals which have no established TLV. The SOCMA survey was based on OSHA requirements. OSHA allows calculations to be made to determine if there is any likelyhood of employee exposure. OSHA also allows the use of spot samples taken at the source of contamination to prove an acceptable exposure. Calculations and spot samples are much cheaper than 8 hour TWA employee measurements.

A list of chemicals used at the Bay City plant is attached. The chemicals are listed for each Unit. A priority for measuring each chemical is given. A one priority was given to chemicals that are more likely contaminants or that are especially hazardous. (Several of the one priorities have already been measured). A two priority was given to chemicals that are less toxic or less likely contaminants. A three priority was given to chemicals with low toxicity or very little chance for exposure. Comments are included listing the analytical technique if known or who will be responsible for providing the analytical method.

The attached list does not include all air contaminants to be measured on Maintenance employees. Also the Laboratory and Traffic (Loading) were not discussed for lack of time. A plan for these employees will be developed at a later meeting.

Uniterms: Air Pollution, Contaminants, OSHA

004897

Dr. Bland pointed out a potential problem area. The sodium nitrite inhibitor that is added to the monoethanol amine solution in the Hydrogen Units could possibly react to form nitrosamines. Nitrosamines are known carcinogens. Since this inhibitor system is not unique to the Bay City Plant, I recommend that Dr. Bland coordinate any inventigation into the safety of this system.

A need for TLV's on HMI and other amines was briefly discussed. No decision on HMI will be made until we get the results of a mutagenacity study. An inhalation study will cost about $18 M.

C. J. Duey

CJD/dea

cc: Mr. P. E. Hime
Mr. D. H. Miller
Mr. K. A. Dunn
Mr. L. E. Hackfeld
Mr. C. J. Brugger
Mr. J. P. Pirtle
Mr. R. C. Reitz
Mr. C. D. Bartine
Mr. H. C. Thiele
Mr. E. E. Abels
Mr. S. C. Dalton
Mr. J. G. Forister
Mr. F. B. Ideus
Mr. C. C. Riggs
Mr. J. C. Susil
Ms. J. I. Luppes
Dr. B. J. Bland - CCCTC
Mr. C. H. Laubly - NYO
Mr. J. M. Ramey - NYO
Mr. J. W. Dunn - CLP
Mr. W. H. Meyer - Bishop
Mr. W. H. Tuke - Pampa
Mr. W. T. McNair - CCCTC
File: 71
Technical Objective: VII. A.

ATTACHMENT

of Chemicals to be Measured as Possible

Air Contaminants in the Work Place

NYLON SALT UNIT

Priority	Chemical	Comments
3	HMDA	Document no exposure
3	Adipic Acid	Document no exposure
2	Nylon Salt	Dust Sample
1	Methanol	Continue Weekly Sample
1	Lubricating Oil Mist	Method from CCCTC

ADIPIC ACID UNIT

3	Cyclohexanone	NIOSH Method
3	Cyclohexanol	NIOSH Method
2	Nitric Acid	
1	NH_4 VO_3	Dust Sample
2	Adipic Acid	Dust Sample
2	NO	
2	NO_2	
3	Mono Basic Acids	
1	Sodium Dichromate	(No sample if we switch to solution).
1	Lubricating Oil Mist	Method from CCCTC

004899

CHOX - CYCLOHEXANONE UNIT

Priority	Chemical	Comments
1	Cyclohexane	Completed (CJD-170-75)
1	Cyclohexanone	Completed (CJD-170-75)
1	Cyclohexanol	Completed (CJD-170-75)
3	COP Acids	Total Carbon (Method from CCCTC)
3	Recycle Diol	Total Carbon
3	Ester	Total Carbon
3	Lean Oil	Total Carbon
3	Chrome Naphthenate	Prove there is no +6 in Reactor
3	CO	
3	Sodium Hydroxide	Document no exposure
1	Lubricating Oil Mists	Method from CCCTC

HNO_3 UNIT

1	Ammonia	NIOSH Method
1	NO	
1	NO_2	
1	HNO_3	
2	Platinum	Dust sample when there is exposure

HDO UNIT

Priority	Chemical	Comments
3	Ester	Total Carbon (Method from CCCTC)
1	Copper Chromite	Dust sample
1	Filter Aid	Dust sample
3	Hexanediol	Total Carbon
3	Recycle Diol	Total Carbon
3	T-70 Overhead	Total Carbon
3	T-60 Residue	Total Carbon
1	Lubricating Oil Mists	Method from CCCTC

AMMONOLYSIS UNIT

1	Ammonia	NIOSH Method
3	Hexanediol	Total Carbon
1	HMDA	Need CCCTC Anal. Dev. help
1	HMI	Need CCCTC Anal. Dev. help
3	Raney nickel	Dust sample before catalyst activation
3	T-74 OH (1,4 DACH)	Total Carbon
2	T-67 OH (Amylamine, piperidine,hexylamine)	Need CCCTC Anal. Dev. help
3	T-68 Res.	Total Carbon
3	T-72 SS	Total Carbon
3	T-72 RES.	Total Carbon
1	Cyclohexanol	NIOSH Method
1	Cyclohexanone	NIOSH Method

AMMONOLYSIS UNIT (cont'd)

Priority	Chemical	Comments
1	Lubricating Oil Mist	Method from CCCTC
2	Baroid S-35 or H-35	

VINYL ACETATE, SO, WACKER

1	Ethylene	
1	Acetic Acid	
2	HQ	Method from CCCTC
2	PBQ	Method from CCCTC
1	Vinyl Acetate	
2	Ethyl Acetate	
1	Acetaldehyde	Method from Bishop
1	Manganese Acetate	Dust sample
	CO	
1	Hydrochloric Acid	Sample after Process improvements
1	Chloroaldehyde	Method from Laubly
2	Methyl Chloride	
2	Ethyl Chloride	
1	Raney Nickel	Dust sample during iso BuOH run.
1	Lubricating Oil Mist	Method from CCCTC

UTILITIES

Priority		Chemical	Comments
	Dowtherm		
1		Biphenyl-Biphenyl ether mixture	
	Hydrogen		
1		Monoethanolamine	Sample when upset
3		$NaNO_2$	Dust sample
3		BaO	No exposure - solution from Lab.
3		$Na_2MoO_4 \cdot H_2O$	Dust sample
		and	
	Water Treatment and Steam		
3		H_2SO_4	NIOSH Method
3		NaOH	
2		Lime	Dust sample
2		Na_2SO_3	Dust sample
2		$NaNO_3$	Dust sample
1		Morpholine	Document no exposure
1		Cyclohexylamine	Document no exposure
1		Chlorine	
	Cooling Towers		
1		Chlorine	
3		Cr 408	Vendors to supply Composition Data
3		Cr 403	Vendors to supply Composition Data
3		AF 521	Vendors to supply Composition Data
3		AF 502	Vendors to supply Composition Data
	Effluent		
1		Ammonia	NIOSH Method

UTILITIES (cont'd)

Priority	Chemical	Comments
1	$FeSO_4 \cdot 7H_2O$	Dust sample
3	NaOH	
3	H_2SO_4	
3	HNO_3	