DEPARTMENT OF THE AIR FORCE
ARMSTRONG LABORATORY (AFMC)
BROOKS AIR FORCE BASE, TEXAS

56 65B

MEMORANDUM FOR 341 MW/CC
341 OG/CD
IN TURN

11 MAR 96

FROM: AL/OEM
2402 E Drive
Brooks AFB, TX 78235-5114

SUBJECT: Launch Control Center (LCC) Indoor Air Quality (IAQ), Malmstrom AFB

1. A number of potentially critical items came to our attention during the IAQ survey this past week and are outlined below. The full consultative letter will follow in approximately two weeks.

2. The make up air fan on the CBR filter is broken at Sierra (S-00) therefore the LCC only receives fresh air when the blast doors are open. We measured carbon dioxide levels above 1700 ppm. At these levels you can expect complaints of headache, drowsiness, fatigue and/or difficulty concentrating from a majority of the occupants. Worker removal should be considered until the make up air fan is repaired.

3. The fresh air intake for all "B" side LCCs are located next to the vehicle parking area. Vehicles were observed parked with engines running for extended periods of time directly adjacent to the fresh air intake. Additionally, the smoking areas and contractor equipment (diesel generator at Quebec) must not be located in this area. The current configuration exposes the LCC missiliers to carbon monoxide and other products of petroleum combustion.

4. We would like to specifically acknowledge the logistical support we received from (b)(6) Their efforts were force multipliers and enabled us to overcome numerous logistical difficulties.

5. Thank you for the opportunity to serve the 341 Missile Wing. My telephone number is DSN (b)(6)

// original signed //

(b)(6) USAF, MC, FS
Occupational and Environmental Medicine Consultant

cc:
341 MG/SG
341 AMDS/SGPB

(c) Sierra 01:

1 The air supply fan at the CBR was not functional. Crew members indicated that this condition has existed for at least six months. No make-up air is being supplied to the LCC. The only times the air is replaced in the LCC is when the blast door is opened.

2 There was a large pool (more than 25 gallons) of fluid below the LCC floor. Considerable biological growth was present on and around the pool. The fluid appears to be condensate from the brine chiller, indicating a clogged drainage system.

3 There was a second, smaller pool (less than a gallon) of the fluid at a brine chiller drain, on the opposite side of the large pool. Biological growth was also present on the surface.

4 The smoking area for the site and vehicle parking are both located directly adjacent to the fresh air intake for the LCEB. During our first visit, a running vehicle was parked within ten feet of the intake for at least twenty minutes, presenting a risk of introducing contaminated air into the LCEB and LCC.

(d) Quebec 01:

1 The floor beneath the LCC was clean and dry.

2 The smoking area for the site and vehicle parking are both located directly adjacent to the fresh air intake for the LCEB, presenting a risk of introducing contaminated air into the facility.

3 All systems appeared to be functioning properly.

(e) November 01:

1 The LCC and the LCFSB were clean and dry.

2 The fresh air damper for the LCSFB was nearly closed.

3 All system components appeared to operating normally.

(4) Air Sampling Results:

(a) Continuous air samples were collected in the [illegible] and [illegible]B (A side) /LCEB (B side) for temperature, relative humidity (RH) and CO_2. Instantaneous CO_2 samples were taken outdoors at each site. Carbon monoxide (CO) was sampled in the LCC and LCFSB/LCEB during a thirty-minute generator run at Alpha (A side) and Quebec (B side).

(b) Alpha:

1 The instantaneous outdoor CO_2 reading collected on 4 Mar 96 was 360 parts per million (ppm). Continuous CO_2 monitoring in the LCC indicated that the steady state concentration is approximately 485 ppm. The steady state concentration for the LCFSB is approximately 400 ppm. The graph for the LCFSB CO_2 readings indicate a steady state of approximately 200 ppm, however, the instrument reading was found to be approximately 200 ppm below actual conditions. Thus we made a correction to the LCSFB steady state measurement. Temperatures ranged from 68 °F to 70 °F in the LCC and 64 °F to 70 °F in the LCFSB. RH in the LCC ranged from 12% to 15% and in the LCFSB from 8% to 9%.

(b)(6)

DEPARTMENT OF THE AIR FORCE

341 Aerospace Medicine Squadron/SGPB (AFSPC)
468 74 th Street North
Malmstrom AFB, MT. 59402-6780

MEMORANDUM FOR: 341 MW/SEG
341 MS/CC

9 May 95

FROM: 341 AMDS/SGPB

SUBJECT: Bioenvironmental Engineering Response to B-1 Missile Alert Facility

1. On 4 May 95 Bioenvironmental Engineering was phoned by crew members of Missile Alert Facility Bravo-1 at 1250 hours. Crew members (b)(6) reported smelling gas in the capsule and made the decision to evacuate. After preparing all necessary dispatch information and obtaining information from REACT personnel (b)(6) Bioenvironmental Engineering responded to the MAF at 1430 hours. BES arrived at 1550 hours.

2. Findings:

a. At 1030 hours crew members reported a malfunctioning video display characterized by a clicking sound which closely resembled a circuit switch cut-off. After the click, the video display shut down with only a white line visible to crew members. Crew members reported a fishy and ammonia smell. Crew members complained of head ache nausea and dizziness. The capsule was evacuated at 1230 hours.

b. Bioenvironmental Engineering obtained oxygen readings, ozone, carbon monoxide, ammonia and triethylamin-5 samples. Oxygen levels within the capsule averaged 21% which is within normal levels. All remaining analytes were less than the detection level.

3. Recommendations and Conclusions:

a. To date, the source of the smell and the cause of the capsule crew symptoms is undetermined. Bioenvironmental Engineering is researching the type of gas associated with tubes used in the REACT modification. Additional information will be forwarded upon receipt.

b. Sample acquisition should be performed as soon after the exposure as possible to try and pin point the chemical contaminant. In the future Bioenvironmental Engineering will respond in a more expedient manner to determine location and type of contaminant.

c. To expedite BES access to the area, all requirements to enter the capsule should be worked while BES is en-route to the MAF. This procedure will hopefully assist with acquisition of more meaningful sample results.

d. BES phoned the Bioenvironmental Engineering Office at F.E. Warren to determine if they had experienced similar problems with the REACT. Speaking with the NCOIC (b)(6) she states they have never experienced such a problem with their MAF's.

4. If there are any questions concerning this letter please feel free to contact our office at ext. (b)(6)

(b)(6)

Chief Bioenvironmental Engineering

HISTORICAL
Date
Init (b)(6)

From: (b)(6)
To:
Date: Tuesday, May 16, 1995 9:14 am
Subject: VDU Capacitor Electrolyte

Yesterday I received an answer and a Material Safety Data Sheet on the electrolyte contained in the VDU capacitors which vented at FEW and most probably here at Malmstrom. I am also in receipt of the failure analyses performed on the VDUs that failed at FEW.

The failure was an overheat and venting of the electrolyte due to contamination during manufacture of the capacitors. The design allows venting in lieu of catastrophic failure.

The electrolyte is Dimethylformamide. Normally it is a clear liquid with a slight amine (ammonia-like?) odor (odor threshold = 21 PPM)

Inhalation can cause nonspecific discomfort such as nausea, headache, or weakness....

Inhalation can also irritate upper respritory passages. (more specifics are contained in the MSDS.)

The 8-hr TWA PEL, TLV, and AEL is 10ppm.

Obviously, LORAL is concerned about this given the observed failure mode and the fact that two crews complained of the expected syptoms when the VDU failed here at Malmstrom. (they were RTB and placed DNIA for a short time by the base hospital.)

Loral is analyzing the volume of electrolyte and a worse case scenario to determine if further safety precautions are required to be put in to place concerning corrective actions involving a VDU failure and subsequent repair actions.

The purpose of this e-mail is to inform you of the problem and to transfer from the SATAF to the REACT program office for follow up.

(b)(6) pls let me know who the POC will be.

Please note that the 341 OG/CC has been very concerned about this so I expect some heightened user interest and awareness. I have notified Base Bio of the electrolyte composition and they indicated they would call up the MSDS from their data base.

So far as I know, no HAP reports have been generated at Wing level.

At a minimum, it seems to me, we may need to place appropriate safety precautions in the front of the respective comm, ops and maintenance T.O.S directing personnel to immediately shut down a

failed VDU and to avoid breathing the vapors given off by it. R&R should not be accomplished until the VDU has had a chance to return to ambient temperature. Personnel who complain of symptoms should be evacuated to clean air and returned to the base hospital for treatment. The above advise is what I will give if necessary during A&CO.

(b)(6) can probably assist us in determining the best method for getting the good word out.

Pls call if any questions.

(b)(6)

CC: (b)(6)

DEPARTMENT OF THE AIR FORCE
341ST MISSILE WING (AFSPC)

8 Apr 96

MEMORANDUM FOR HQ AFSPC/LGML
150 Vandenberg St, Suite 1105
Peterson AFB, CO 80914-4470

FROM: 341st Medical Group
468 74th Street North
Malmstrom AFB, MT 59204-6780

SUBJECT: Dimethylformamide in REACT Missile Alert Facilities

1. On 27 Mar 96 my Bioenvironmental Engineering office responded to a dimethylformamide spill at a REACT configured missile alert facility capsule (Bravo). This marks the second such response to Missile Alert Facility Bravo regarding the release of this material; reference our letter dated 9 May 95, which is attached. Preliminary investigation reveals this material serves as an electrolyte contained in the Video Display Unit (VDU) capacitors. The capacitors overheat and vent into the capsule in lieu of catastrophic failure. To date, we have no idea how much of this material is contained in the capsules nor do we have any idea of the relative hazard to missile crews and maintenance personnel who come in contact with this material.

2. Recommendations/Conclusions:

a. Recommend LORAL personnel be consulted and determine total quantity and location of all dimethylformamide in the REACT configured capsules.

b. Recommend LORAL personnel be consulted to determine worse case exposure scenario for crew members and maintenance personnel.

c. Recommend technical data be updated to reflect the hazards of this electrolyte and clean up procedures required to render the area safe for normal maintenance and crew occupancy.

3. My Bioenvironmental Engineer (b)(6) is my point of contact for this issue and can answer any questions/concerns you may have, at the local level. Your attention to this issue and expedient resolution to this problem is appreciated.

(b)(6)
BSC
Commander

Attachment:
Bioenvironmental Engineering Letter, 5 May 95

cc: HQ AFSPC/SGPB
HQ AFSPC/DRMG
341 MW/CC
341 OG/CC
10 MS/CC

Memo For Record
PCB Spill G-1

At 2036 hrs on the 13th of Oct.I recieved a call from Job Control about a PCB spill at G-1. I was then told to call Wing Command Post. Upon calling them I was patched into a conference call with Job Control, Command Post, and the crew commander (b)(6)

(b)(6) complained of a severe headache and light headness upon waking up after 1 hrs sleep. He and his deputy started looking around and found a clear sticky syrup under the LECB Panel. I suggested that the blast door be opened for more ventilation and that no contact be made with the substance. I then told them I would contact (b)(6) for anymore information and let them know what he said.

After talking with (b)(6) I called the Command Post were I was again put through on a conference call this time with (b)(6) I told (b)(6) that all the team needed to do was open the blast door and stay away from the spill. There was no need to close down the capsule. I also told Job Control that the first qualified team to go out to clean up the spill was to notify this office prior to leaving for a briefing we needed to give them.

(b)(6)
USAF
Bioenvironmental Engineering Tech.

MEMO FOR RECORD 6 Dec 88

SUBJECT: Asbestos Sampling During Diesel Generator Run Up

29 June 88: (b)(6) and I met a 341 FMMS Periodic Maintenance Team (PMT) at Launch Facility (LF) Golf-8 to perform sampling for asbestos during a diesel generator run up. Upon arrival, two (2) bulk asbestos samples were taken of the insulation material surrounding the diesel exhaust. In addition, three (3) general room air samples were taken, with DuPont P4LC air samplers, while PMT was performing the run up. Results are as follows:

SAMPLE #	TYPE	RESULTS
EX880265	General Room Air	<0.005 fibers/cc
EX880266	General Room Air	<0.005 fibers/cc
EX880267	General Room Air	<0.005 fibers/cc
BK880268	Control	None Detected
EX880269	Bulk	1% Amosite, 10% Chrysotile
EX880270	Bulk	35% Amosite

18 Oct 88: (b)(6) and I visited LF Quebec-12 with (b)(6) to perform asbestos sampling during the diesel generator run up. Again, DuPont P4LC pumps were used for the air sampling portion and the two bulk samples were taken from the insulation material surrounding the diesel exhaust. Results are as follows:

SAMPLE #	TYPE	RESULTS
EX880399	General Room Air	<0.01 fibers/cc
EX880400	General Room Air	<0.01 fibers/cc
BK880401	Control	None Detected
GM880402	Bulk	30 to 50% Amosite
GM880403	Bulk	<1.0% Chrysotile, 1 to 5% Amosite

Manhours Used: (b)(6) = 15 hours
= 15 hours
Total = 30 hours

(b)(6)

Bioenvironmental Engineering Technician

AL/[illegible]
2402 E DRIVE
BROOKS AFB, TEXAS, 78235-5114

REPURT OF ANALYSIS

SAMPLE TYPE: BULK ASBESTOS

SITE IDENTIFIER: XXXX189A DATE RECEIVED: 921112

DATE COLLECTED: 921109 DATE REPORTED: 921113

DATE ANALYZED: 921112

SAMPLE SUBMITTED BY: 43 CES/DEEV

COPY TO: 43 MEDICAL GROUP/SGPB

This analysis was performed in accordance with the EPA Interim Method 600/M4-82-020, Dec. 1982. (Asbestos by PLM)
Limits of Detection: OSHA = 0.1% (equivalent to EPA limit of <1%)

For routine samples, concentrations are visually estimated area percent values. (Values reported 1 to 5% are considered to be greater than 1% but less than 5%.) For demolition or renovation samples, concentrations of values >0% but <5% are determined by point counting.

OEHL #	BASE #		RESULTS
92066727	GM920574	Chrysotile Asbestos	15-30 %
92066728	GM920575	Chrysotile Asbestos	15-30 %

Analyzed by (b)(6)

Acting Chief, Bulk Asbestos Function

Reviewed by: (b)(6)

Chief, Occupational Chemistry Branch

TO:

43 MEDICAL GROUP/SGPB
MALMSTROM AFB, MT 59402-5300

BIOENVIRONMENTAL ENGINEERING
QUARTERLY LCF VISIT CHECKLIST

SMS: 10th LCF: Bravo DATE: 14 Feb 89

1. LIGHTING: No Complaints

2. VENTILATION: Good

3. CHEMICAL HAZARDS:

   A. USAGE Good
   B. STORAGE Good

4. NOISE:

   A. GENERATER ROOM POSTED? Yes
   B. HEARING PROTECTION? Good
   C. OTHER SOURCES? No

5. RADIATION:

   A. MICROWAVE SURVEY CURRENT? 30 Mar 88
   B. TOPSITE ANTENNAE POSTED? Yes

6. INSECT & RODENT CONTROL Good

7. SEWAGE LAGOONS:

   A. FREE OF SCUM & EXCESSIVE GROWTH? Yes
   B. FUNCTIONING PROPERLY? Yes Door in Rms Boiler Rm 103 Rm

8. WATER SUPPLY:

   A. DAILY CHLORINE? Yes
   B. SAC FORM 416 PROPERLY MAINTAINED? Yes
   C. FM PROFICIENT WITH DPD & pH TESTS? Yes
   D. FUNCTIONING PROPERLY? Yes
   E. SANITARY?
      1. System leaks? No
      2. Watertight well cap? Yes
      3. Repairs disinfected/flushed? No
      4. Negative bacteriological trend? ND

9. ASBESTOS CONDITION: See Reverse

(OVER)

WATER SUPPLY (cont):

WATER SOURCE: Well

SYSTEM FILTRATION: F101 and 102

SYSTEM TREATMENT: FM mixes

LAST CHEMICAL ANALYSIS: 22 Aug 88

LAST RADIOLOGICAL ANALYSIS: 21 Nov 88

pH: 7.7 CHLORINE: FRX .6 Total .7

COMMENTS/DISCREPANCIES:

Alcohol, Acetone, white enamel, Olive drab, black lacquer, PD-680, paint remover, sea foam paint, tabacco brown, White paint

motor oil, 2 cycle oil

Diesel Rm - when running leaks asbestos - SMIS

Sewage Lagoon ?

Radiological Sample # 6

(b)(6)

BEE TECHNICIAN

(b)(6)

Have DO generate 1135 to CE to investigate asbestos on diesel.

(b)(6)

89

USAF, BSC

Chief Bioenvironmental Engineer

BULK MATERIAL SAMPLING DATA

(Use this space for mechanical imprint)

WORKPLACE OR SITE IDENTIFIER: 0129 XXXX XXXX

BASE: MALMSTROM

ORGANIZATION: 341 MXS

WORKPLACE OR SITE: LF L-07

DATE COLLECTED (YYMMDD): 960521

BLDG NO/LOCATION: N/A

ROOM/AREA: N/A

MAIL REPORTS TO (circle if change)

ORIGINAL: 0124 — 4687 4th St. N. 341st AMDS/SGPD MALMSTROM AFB, MT 59402-6780

COPY 1:

COPY 2:

(b)(6)

REASON FOR SUBMISSION: O

A-ACCIDENT, INCIDENT C-COMPLAINT F-FOLLOWUP/CLEANUP
R-ROUTINE BACKGROUND/PERIODIC SURVEY O-OTHER

OEHL PID:

SOURCE BEING SAMPLED: DIESEL GENERATOR AIR DUCT

EXISTING CONTROLS (Personal protective equipment, Engineering Administrative): NONE

SAMPLE COLLECTION DATA

OEHL SAMPLE NO			
BASE SAMPLE NO		GM961093	
A	CHECK FOR	☐ MAJOR COMPONENTS	☐ MAJOR COMPONENTS
B	NAME	ASBESTOS	
	NIOSH NO.	CL647500 00	
C	NAME		
	NIOSH NO.		
D	NAME		
	NIOSH NO.		
E	CHECK FOR	☐ HAZARDOUS/TOXIC WASTE	☐ HAZARDOUS/TOXIC WASTE
MATERIAL NAME		N/A	
LOT NUMBER		N/A	
NSN (FSN)		N/A	
SPECIFICATION (MIL or FED)		N/A	
MANUFACTURER'S NAME		N/A	
DESCRIPTION OF MATERIAL USAGE (Heated, brushed, sprayed, etc.)			
SUPPORTING SAMPLES	OEHL SAMPLE NO.		
	BASE SAMPLE NO.		
	SAMPLE TYPE		

COMMENTS: (b)(6) PICKED UP COPY OF RESULTS ON 1 JUL 96 (b)(6)

AF FORM 2751 JAN 81

AL/
2402 E DRIVE
BROOKS AFB, TEXAS, 78235-5114

If your office has comments or any questions concerning analytical results or methods, please let us know in the Analytical Services Division at (b)(6) or via electronic mail at (b)(6)

Enclosed you will find laboratory reports for the following samples:

BASE SAMPLE #	AL/OE SAMPLE #	BASE SAMPLE #	AL/OE SAMPLE #	BASE SAMPLE #	AL/OE SAMPLE #
GM961093	96031547				

Analyzed by: (b)(6)
USAF
Technician

Reviewed by: (b)(6)
GM-13
Chief, Occupational Chemistry Branch

TO: 341 AMS/SGPB
468 74th STREET NORTH
MALMSTROM AFB, MT 59402-6780

2/95

AL/
2402 E DRIVE
BROOKS AFB, TEXAS, 78235-5114

REPORT OF ANALYSIS

SAMPLE TYPE: BULK ASBESTOS

SITE IDENTIFIER: XXXXXXXX DATE RECEIVED: 960523

DATE COLLECTED: 960521 DATE REPORTED: 960531

DATE ANALYZED: 960531

This analysis was performed in accordance with the EPA Method 600/R-93/116, July 1993. (Asbestos by PLM) Limits of Detection: OSHA = 0.1% (equivalent to EPA limit of <1%)

For routine samples, concentrations are visually estimated area percent values. (Values reported 1 to 5% are considered to be greater than 1% but less than 5%.) For demolition or renovation samples, concentrations of values >0% but <5% are determined by point counting.

OEHL #	BASE #		RESULTS
96031547	GM961093	Chrysotile Asbestos	30-50 %

Analyzed by: (b)(6) USAF
Occupational Chemistry Technician

Reviewed by: (b)(6)
Chief, Occupational Chemistry Branch

TO:

341 AMS/SGPB
468 74th STREET NORTH
MALMSTROM AFB, MT 59402-6780

AL
2402 E DRIVE
BROOKS AFB, TEXAS, 78235-5114

CUSTOMER: 341 AMS/SGPB
468 24th STREET NORTH
MALMSTROM AFB, MT 59402-6780

INVOICE DATE: 31-May-96

CUSTOMER DOCUMENT NR: MLM-CEV-96-11
CUSTOMER SAMPLE NR: GM961093 AL/OEA SAMPLE NR: 96031547

ANALYTICAL METHOD	CHARGE
POLARIZED LIGHT MICROSCOPY	$ 19.00
TOTAL CHARGE GM961093	$ 19.00
TOTAL CHARGE THIS INVOICE	$ 19.00

From: (b)(6)
To:
Date: 6/7/96 6:33am

AL/OEA
2402 E DRIVE
BROOKS AFB, TEXAS, 78235-5114

REPORT OF ANALYSIS

SAMPLE TYPE: BULK ASBESTOS

SITE IDENTIFIER: XXXXXXXX DATE RECEIVED: 960523

DATE COLLECTED: 960521 DATE REPORTED: 960531

DATE ANALYZED: 960531

The preparation was screened at a magnification of 20,000x in the TEM. Structures greater than or equal to 0.5 um in length and having an aspect ratio of 5:1 or greater were examined by electron diffraction to determine if their chrystalline composition is consistent with chrysotile or amphibole asbestos. Structures were further characterized by energy dispersive x-ray analysis which provides an elemental profile of the structure which can be compared to standards for asbestos and non-asbestos materials. It is possible from the TEM examination to estimate the proportion of asbestos in the final residue, and consequently a final percentage of asbestos in the sample can be estimated.

OEHL #	BASE #	RESULTS	
96031547	GM961093	Chrysotile Asbestos	30-50 %

TO:

341 AMS/SGPB 2/95 PAGE 1
468 74th STREET NORTH
MALMSTROM AFB, MT 59402-6780

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 341ST SPACE WING (AFSPC)

26 Jun 03

MEMORANDUM FOR 341 CES/CC
/CEOFC ((b)(6))

FROM: 341 MDOS/SGOAB

SUBJECT: Air Sample Result for Asbestos Glove Bag Abatement

1. **Background:** on 9 Jun 03, (b)(6) of Bioenvironmental Engineering conducted air sampling at Romeo Missile Alert Facility. The sample was collected while (b)(6) from the Base Asbestos Abatement Team (BAAT) conducted asbestos glove bag abatements. The abatements were on two different sections of water pipe insulation in the boiler room.

2. **Findings:** The following table shows the results of the air sample:

Sample location	Results TWA	Results for Ceiling	OSHA Std for TWA[1] and Ceiling[2]
Personal air sample during abatement	0.0023 f/cc	0.0194 f/cc	0.1 f/cc[3] TWA 1.0 f/cc Ceiling

Notes:
[1] Occupational Safety and Health Administration (OSHA) established standards on asbestos.
Time Weighted Average (TWA) is the maximum level of exposure for an 8-hour day, 40-hour week.
[2] Ceiling limit is the maximum level that a person can be exposed to in a 30 minute time period.
[3] Fibers per cubic centimeter (f/cc) is the concentration of fibers in a cubic centimeter.

3. **Conclusion:** The sample shows that the exposure was below occupational exposure limits. Personnel of the BAAT need to continue current work practices IAW all applicable state and federal regulations. (b)(6) was wearing a 3M full-face respirator with HEPA filters, and a Tyvek suit.

4. This letter needs to be posted in the shop for 10 days. If you have any concerns about this letter contact (b)(6)

(b)(6)
SSgt, USAF
Bioenvironmental Engineering

(b)(6)
Chief, Bioenvironmental Engineering

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 341ST SPACE WING (AFSPC)

4 Apr 03

MEMORANDUM FOR 564 MS/CC

FROM: 341 MDOS/SGOAB

SUBJECT: 564th Asbestos Sampling

1. **Background**: Bioenvironmental Engineering (BE) collected an asbestos sample from pipe insulation under Tango Missile Alert Facility (MAF) on 6 Feb 03. The sample result, identifying that the insulation was 5 to 10 % Chrysotile asbestos, was received on 12 Feb 03. The insulation was removed using a glove bag; three Base Asbestos Abatement Team (BAAT) members performed the abatement. It was decided that the other four MAFs should be inspected and have samples taken. The inspections and samples would determine if the other MAFs contained asbestos insulation and if removal would be required.

2. **Survey**: On 25 Feb 03, three BE personnel ((b)(6)) and one BAAT member ((b)(6)) went to inspect and collect samples of the insulation at Papa, Quebec, Romeo, and Sierra MAFs. The samples were taken while capsule crew members were present at each site. Pictures were taken at Papa MAF with BE camera (pictures were not taken at the other sites due to camera not being "- 12" compliant). In addition to the insulation sample, a sample of the floor tile at Papa was collected at the request of the capsule crew. The results of the inspections are as follows:

a. Papa MAF
   i. Insulation was in good condition and BE identified two elbows with insulation.
   ii. Floor tile was in good condition, but the corner was broken (1" x 1") and was used for sample analysis.
b. Quebec MAF insulation was in good condition and one elbow with insulation was identified.
c. Romeo MAF had no insulation identified.
d. Sierra MAF insulation was in fair condition and one elbow with insulation was identified.

3. **Findings**: Four samples were sent to AFIERA lab located at Brooks City Base (formerly Brooks AFB) on 26 Feb 03. BE received results on 6 Mar 03, stating that no asbestos was detected. ((b)(6)) called AFIERA to have samples reanalyzed[1]. AFIERA sent samples to Clayton Lab who reported the results to BE on 24 Mar 03. A summary of the samples are listed in the chart below.

[1] Note- the 564th missile complex was built by one company. That company would have bought the same insulation for all five sites. The sample result from Tango identified that it contained asbestos. When results were received for the other sites, stating that no asbestos was found it brought up questions, such as why do they not contain asbestos and Tango did. Upon ((b)(6)) request to AFIERA to have the samples reanalyzed, AFIERA agreed to send them to Clayton Lab for a more accurate analysis.

Chart: Sample Summary

564 MS	Date Sample Taken	Date Received Results	Results
Papa	25 Feb 03	24 Mar 03	8.4% Chrysotile Asbestos
Papa (floor tile)	25 Feb 03	24 Mar 03	< 0.1% No Asbestos
Quebec	25 Feb 03	24 Mar 03	8.2% Chrysotile Asbestos
Sierra	25 Feb 03	24 Mar 03	11% Chrysotile Asbestos

4. **Recommendations:**

a. The insulation at Papa and Quebec MAFs was intact and in good condition; however the location of the insulation poses the possibility it might be disturbed during maintenance on the capsule floor or pipes. We recommend these two sites either have the insulation encapsulated to maintain integrity of the asbestos, or have the insulation removed. There is no health risk at this time.

b. The insulation at Sierra was in fair condition. The location of the insulation poses a low risk of being disturbed. If the insulation was disturbed, the possibility that it would become friable (crumbled or crushed into a powder and cause airborne fibers to be inhaled) is much higher. The recommendation for this site is to have the insulation removed prior to any maintenance. There is no health risk at this time.

5. A copy of this memorandum will be maintained in the BE office. If you have any questions please contact (b)(6)

(b)(6)

SSgt, USAF
NCOIC, Bioenvironmental Engineering

(b)(6)

Chief, Bioenvironmental Engineering

Cc:
341 SW/CV
341 OG/CD
341 CES/CEO
341 MDOS/CC
341 MDOS/SGOAH
341 CES/CEV (b)(6)
341 SW/SEG (b)(6)

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE FOR ENVIRONMENT, SAFETY
AND OCCUPATIONAL HEALTH RISK ANALYSIS (AFMC)
BROOKS AIR FORCE BASE, TEXAS

30 Dec 2001

MEMORANDUM FOR 341 MDOS/SGOAB/SGOAM

FROM: AFIERA/RSHI
2513 Kennedy Circle Bldg 180
Brooks AFB, TX 78235-5123

SUBJECT: Consultative Letter, IERA-RS-BR-CL-2001-0120, Exposure Assessment of Missile Crew Members in 564th Missile Squadron, Malmstrom AFB, MT.

1. **INTRODUCTION:**

a. **Purpose:** At the request of the 341 MDOS Bioenvironmental Engineering Flight, AFIERA/RSHI conducted an assessment of workplace exposures on all of the 564th Missile Squadron Missile Alert Facilities (MAFs) from 2 to 5 July 2001. 341 MDOS Bioenvironmental Engineering had requested our support in response to heightened crew member concerns over potential sources of chemical and biological exposures within the MAFs.

b. **Survey Personnel:**

(b)(6)

c. **Personnel Contacted:**

(b)(6)

d. **Survey Equipment:**

(1) SKC High/Low Flow Pumps- used to collect air samples
(2) BIOS Dry Cal calibrator- used to calibrate SKC high/low flow pumps
(3) Kurz 444 Ventilation Meters – used to measure ventilation system performance
(4) TSI Q-Trak Indoor Air Quality Meter- used to measure relative humidity, temperature, and carbon dioxide concentrations (CO2)

2. **BACKGROUND:**

a. Personnel in the 564th Missile Squadron have concerns over the health and safety of working conditions within the Launch Control Centers (LCCs) of the Missile Alert Facilities (MAFs). The concern was initially expressed based on the occurrence of lymphomas (lymph node cancers) among three missile crew members who had worked in the 564th Missile Squadron over a 3-year period between 1994 and 1997.

b. Operational and Facility Description:

(1) The 564th Missile Squadron is comprised of five MAFs. The locations of all the MAFs are scattered throughout a region northwest of Malmstrom AFB, with the majority located near and surrounded by actively farmed agricultural areas.

(2) Each of the five LCCs evaluated were of similar construction. The MAFs capsule is situated completely underground with access provided by an elevator shaft system. The capsule is divided into three main areas: the launch control equipment building (LCEB), the clean room, and launch control center (LCC).

(3) LCCs are separated from LCEBs by air-tight blast doors. Ambient air is mechanically driven with a fan into the LCEB through a duct that runs to the surface, and is similarly exhausted through a separate duct. Air brought into the LCEB is pulled into the LCC with a 5.25-inch make-up air fan positioned within the LCEB, and exhausted with a 3-inch fan located in the LCC.

(4) The egg-shaped LCC has an inherent volume of 21,000 cubic feet; the acoustical enclosure, which is open to the full LCC, has a volume of 5,300 cubic feet. When assessing air exchange rates, the larger LCC volume is the most appropriate volume to apply. Note that the volumes are the design volumes, prior to installation of equipment; therefore, the actual volume is smaller.

(5) The LCCs are manned 24-hours a day, 7 days a week, 365 days a year. A 2-person crew stays in the LCC for a period of 24 hours at a time until a new crew arrives.

c. Potential exposures: Based on information provided by the 564th Missile Squadron and the 341st Medical Squadron, and a visual inspection of the MAFs and LCCs, the AFIERA team evaluated potential exposures to personnel from the following sources:

(1) Ambient airborne substances originating within capsule: naphthas and other volatile organic compounds, from diesel fuel used in a generator housed within the LCEB; polychlorinated biphenyls (PCBs), known to be contained in some electrical components in the LCC; intermittent exposure to emission from the periodic burning of crypto tape; infrequent corrosion control activities; and biological exposures from stagnant water at A/C discharge point within the LCC.

(2) Ambient airborne substances originating outside capsule: pesticides, herbicides, and chlorophenols, all potentially used in agricultural applications to crop fields located near the MAFs.

(3) Drinking water: Water is brought into an 750 gallon holding tank in the LCC from the surface through black iron pipe. Consequently, there could be possible exposures to metals contained in the pipe; pesticides and herbicides potentially present in the source water; or bacteriological growth.

(4) General Indoor Air Quality: Inadequate air flow could lead to potential comfort problems for missile crews. Environmental conditions of temperature, relative humidity, and carbon dioxide are factors that can indicate the adequacy of environmental controls within a facility.

(a) Carbon dioxide: According to ASHRAE® Standard 62-1999, "Ventilation for Acceptable Indoor Air Quality," fresh air is required to "dilute odors from human bioeffluents to levels that will satisfy a substantial majority" of persons. Carbon dioxide (CO_2), which is released at a rate of 0.31 Liters per minute (L/min) by sedentary persons, is considered to be a good marker of bioeffluents. When levels of CO_2 are maintained below 700 parts per million (ppm) above the background (or outdoor) levels of between 300 and 500 ppm, a substantial majority of people will be satisfied. This implies that concentrations of CO_2 should be held to less than 1200 ppm to provide for worker comfort. Both the Occupational Safety and Health Act (OSHA) and the American Conference of Governmental Industrial Hygienists (ACGIH®) have established an 8-hour Time-Weighted Average (TWA) exposure limit of 5000 ppm for CO_2. The basis for the exposure limits is primarily driven by its simple asphyxiant properties, although it can also be a "potent stimulus to respiration, and both a depressant and an excitant of the central nervous system."

(b) Temperature and relative humidity: Both play a role in comfort and in controlling growth of biological matter, such as fungi. Most complaints in non-industrial settings occur when relative humidity is less than 30 percent or greater than 60 percent, or temperatures fluctuate greatly due to an imbalanced

or poorly designed ventilation system (reference ASHRAE Standard 62-1999). Recommended temperature ranges for indoor work range from 68-75°F during the winter, and 73-79°F in the summertime (reference ASHRAE Standard 55-1992, "Thermal Environmental Conditions for Human Occupancy"). Please note that these temperature ranges are only recommendations, and local conditions, such as clothing requirements and workload, dictate the appropriate ambient temperatures.

(c) The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Std 62-1999, Table 2, "Outdoor Air Requirements for Ventilation – Chapter 2.1, Commercial Facilities," recommends 20 cubic feet per minute/person (cfm/person).

(5) Contact with PCBs: There have been reports of leaking electrical components in the past that are believed to contain PCBs. Contact with PCB-containing fluids could lead to mild to moderate skin irriation and chloracne, as well as toxic liver effects when PCBs are absorbed into the body through the skin.

3. **SURVEY PROCEDURES:**

a. Air Sampling: During this survey, area air samples were collected within LCCs for all five MAFs: Papa, Quebec, Romeo, Sierra, and Tango. Sampling addressed possible substances originating within and outside of the LCC (see Attachment 1). Air sampling positions within each capsule were selected specifically to identify hazardous materials that could potentially be present in the LCC, or had been identified as potential substances used in the immediate vicinity of the MAF over the previous several years. Locations were selected to be different positions from each other, in order to represent the range of locations in which personnel could work or rest (see Attachment 2). Samples were collected for a total period in each LCC of approximately between 5 and 8 hours (see Attachment 3 for specific sample times and associated parameters).

b. Air quality was monitored for carbon dioxide (CO_2), temperature, and relative humidity in three of the five LCCs (Papa, Sierra, and Tango). An Indoor Air Quality (IAQ) meter capable of measuring all three parameters was used. The meter logged the data each minute, allowing a comprehensive assessment of the entire monitoring period. Air was monitored for a duration approximately equivalent to the air sampling times cited above. Locations were selected as shown in Attachment 2.

c. Ventilation measurements were taken to determine the amount of fresh air entering the LCC. Measurements were taken for all LCCs except Sierra, whose ventilation system was not operational at the time. Air flow rates were estimated by measuring face velocities and fan size at the LCC make-up air fan within the LCEB. Similarly, LCC exhaust air flow rate was determined by measuring face velocities and opening size for the exhaust duct located above the latrine in the LCC capsule.

d. Water samples were collected from the bathroom sink cold-water tap in all five LCCs. We removed the faucet screens and flushed the lines before collecting the samples. Water originates topside but is carried through a black iron pipe into a 750-gallon holding tank below the capsule. It is pressurized to provide adequate flow into the bathroom sink within the LCC. To detect potential infiltration of pesticides and herbicides from reservoir and wells, testing included a screening for pesticides and herbicides per EPA method 525.2 (183 chemicals in the parameter list) and 515.3 (17 chemicals), respectively. The samples were also analyzed for 15 metals (some of which are typically used during the manufacturing of black iron pipes) via EPA method 200.8. The 341 MDOS/Bioenvironmental Engineering shop tested the water for chlorine levels during our visit.

e. Composite and grab samples of topside surface soil were collected near the ventilation intake in areas where dirt/dust could potentially be suspended and pulled into the ventilation system. These samples were analyzed for pesticides and herbicides to determine the amount of residual that may have accumulated over the years as a result of agricultural application of these substances to adjacent crop fields. Samples were also collected outside of the restricted fenced area to establish background concentrations.

f. Although no structured interviews were done, informal interactions with each of the missile crews provided a great opportunity for the team to gather insight into the conditions of the working environment and to better understand the concerns of personnel in the squadron.

4. RESULTS/DISCUSSIONS

a. Air Sampling Results: Air sampling for all chemical substances in each of the five LCCs indicated exposures to be less than the laboratory limits of detection, except for a trace quantity of naphthas (volatile organic substances) detected in the Quebec LCC. However, one of the blank samples also showed a trace amount. Blanks, which were never exposed to the work environment, are used to assess potential contamination of media during the manufacturing and handling processes. Results for actual sampling media are usually adjusted for any amounts of substance found on a blank. Therefore, after correction the one trace sample is deemed less than the detection limit as well.

b. Indoor Air Quality: Carbon dioxide, relative humidity, and temperature measurements for each of the three LCCs tested (Papa, Sierra, and Tango) are shown in Attachment 4.

(1) Carbon dioxide: All carbon dioxide levels were considerably less than the recommended worker comfort maximum of 1200 ppm in every facility except Sierra. This indicates that carbon dioxide levels within two of the three LCCs tested meets ASHRAE criteria. In Sierra LCC, whose make-up air fan was inoperable at the time of the survey, carbon dioxide levels averaged 1363 ppm. While this concentration does not exceed the occupational exposure limit, it does slightly exceed the ASHRAE-recommended standard for worker comfort.

(2) Relative humidity: Average relative humidity levels ranged from 28 percent (in Tango LCC) to 34 percent (in Sierra LCC). These are near the low end of the ASHRAE-recommended values for indoor air; however, they are representative of the outdoor humidity levels to which personnel are accustomed in the Great Falls area.

(3) Temperature: The average temperature within all three LCCs tested was 73 degrees F. This falls within the ASHRAE recommended temperature guidelines for winter and summer.

c. Ventilation: Estimates of ventilation flow rates in four of the five LCCs (Attachment 5) show that fresh air levels brought into each facility exceed the minimum recommended flow rate of 20 cfm/person. (As stated previously, we did not measure ventilation exchange rates in Sierra LCC due to a broken make-up air fan.)

d. Water Sampling: Concentrations of chemicals in the water are low, meeting all primary drinking water standard regulatory limits, which indicates that the water is safe to drink with respect to harmful chemicals. However, note that 341 MDOS/Bioenvironmental Engineering tested the water for chlorine at the time of our sample collection and determined that there was no residual chlorine available at any of the five sites; residual chlorine is recommended for ensuring no biological growth occurs in the water. Attachment 6 lists concentrations of metals detected in the water. Specific sampling results for metals, pesticides, and herbicides at each site are discussed below:

(1) Papa: Concentrations of all pesticides and herbicides were below the laboratory limits of detection except for dalapon, an herbicide, which had a concentration of 2.0 ug/L, 1/100 of its Maximum Concentration Limit (MCL). Seven out of 15 metals were detected in trace amounts, below their respective MCLs.

(2) Quebec: Concentrations of all pesticides and herbicides were below the laboratory limits of detection. EPA method 200.8, metals screening, detected trace amounts of six analytes out of 15. The remaining nine chemicals were all below detectable limits.

(3) Romeo: Concentrations of all pesticides and herbicides were below the laboratory limits of detection except for fluorine, a pesticide, which was found at a concentration level of 0.1 ug/L. No MCL currently exists for this chemical; however, relative to other fluorinated compounds, this is a very low concentration. Trace amounts of eight out of 15 metals were detected.

(4) Sierra: Concentrations of all pesticides and herbicides were below the laboratory limits of detection. Trace amounts of eight out of 15 metals were detected.

(5) Tango: Concentrations of all pesticides and herbicides were below the laboratory limits of detection. Trace amounts of nine out of 15 metals were detected.

e. Soil Sampling:

(1) The majority of analytes tested were below the laboratory limits of detection. Trace amounts of some compounds commonly used in pesticides and herbicides were detected in some of the samples. However, all concentrations are considerably lower than the Environmental Protection Agency's "1 in a million" risk of cancer that is commonly used for exposures to the public in industrial work areas. Soil sampling results are summarized in Attachments 7 through 9.

(2) Air brought into the ventilation system is cleaned by an Chemical, Biological, and Radiological (CBR) filter in the LCEB prior to it being taken into the LCC. The design standards for this filter require it to be greater than 99.97 percent efficient at removing particulate matter. Therefore, potential exposure to personnel in the LCC from any residual pesticides or herbicides contained in the soil is extremely low.

f. Other observations:

(1) There was some evidence of organic growth of a black, slimy appearance at the base of some LCC capsules where stagnant HVAC condenser water has accumulated. This evidence was most pronounced in Quebec LCC. It appears that the sump pump used to remove water accumulation is not functioning adequately to remove any discharge. While not identified, it is currently in a wet form, which inhibits release of substances into the air. Furthermore, it is in an area where little air flow is present, thereby posing minimal exposure risk to missile crews, even in a dry state.

(2) Ventilation filters: Air within the LCC is recirculated through a bank of cleaning filters to control dust levels. Air filters in Papa and Romeo contained the most debris, but appeared to be otherwise in good shape. The remaining air filters were clean.

(3) Polychlorinated biphenyls (PCBs): Air sampling for PCBs was not accomplished during this survey. The vapor pressures of PCBs are extremely low, such that a potential inhalation hazard to personnel is very unlikely. Furthermore, a meticulous survey of the five LCC capsules showed no signs of past or present leakage that would warrant sampling. PCBs primarily represent a possible hazard to personnel under two conditions: when heated or burned, or when personnel come into direct physical contact with these compounds.

(4) Hazardous materials usage by the 2-person crew was very minimal. Occasional use of office-type cleaning supplies does not pose a risk to personnel.

(5) At the end of each work shift, personnel dispose of crypto tape via combustion in a small coffee can. The tape is lit with a match and is at times burned using a paper towel as a starter fuel. At the end of each month, a larger quantity of tape is disposed through combustion.

(a) Two types of crypto tape have been used in the recent past. From 1994 to 1997, a blue-colored tape composed of Mylar® and paper was used. From 1997 to the present, a white-colored tape was used. In the near future, missile crews will switch to using an off-white crypto tape that, according to the National Security Agency (NSA), is nearly identical in composition to the bluish tape. Part numbers and manufacturer information was not readily available for these products. However, the NSA was able to provide samples of the blue and white tapes for combustion product analysis.

(b) The blue-colored and white-colored tapes were burned under controlled laboratory conditions and analyzed via infrared (IR) spectrometry to identify the composition of gases released during combustion. Products from the bluish sample were relatively "clean" – releasing carbon dioxide, carbon monoxide, and water vapor. The white crypto tape released carbon dioxide, carbon monoxide, water vapor; and double-bonded hydrocarbons consisting of acetylene, ethylene, and propylene.

(c) It is not possible to effectively estimate the concentrations of these gases in the capsule without collecting air samples within the LCC itself during burning operations. However, with the exception of carbon monoxide, each of the gases released are classified as simple asphyxiants and will not pose a health hazard to missile crews. With the small amount of material burned, carbon monoxide levels would be expected to be well below the Occupational Exposure Limit (OEL) of 50 ppm. Air sampling is not necessary to assess this exposure.

(6) Corrosion control activities are occasionally conducted to apply rust-resistant coatings to the interior of the LCC. To the best of our knowledge, coatings are rolled (not sprayed) onto the interior surface. We do not have enough information to assess possible exposures to personnel in the LCC during coating applications. 341 MDOS/Bioenvironmental Engineering has conducted limited air sampling in the past, which indicated levels of organic solvents to be below their respective exposure limits. We recommend additional sampling and assessment when the opportunity arises.

5. **RECOMMENDATIONS:**

a. 341 MDOS/Bioenvironmental Engineering should further assess corrosion control activities to evaluate potential exposures both to missile crews and to maintenance personnel. Some exposure data is available from previous years, and should be considered as part of the evaluation.

b. 564 MS and 341 CES should ensure the make-up air fans are functioning properly, especially in Sierra MAF. These are critical components of the air handling systems. Since there is a history of make-up air fan failure, maintenance personnel should have spare fan assemblies available to install when the need arises.

c. Drinking water: While our survey indicated metal levels to be within standards, there was no residual chlorine available in the tanks. This is likely a result of stagnation. Based on the 750-gallon tank storage volume in each LCC, it would take a 2-person crew approximately 1 month to consume the water in the tank (2 people @ 15 gallons per day for toilet, hand washing, etc. over each 24-hour period). Stagnant water with no residual chlorine could lead to bacteriological growth. For this reason, we recommended further assessment to ensure the potability of the water, to include routine bacteriological monitoring.

d. 564 MS and 341 CES should inspect the sump pumps at the base of the capsule to ensure they are functioning properly and adequately removing water accumulating at the base of the LCC from outside sources or from the air conditioning condenser drainage tube.

6. **CONCLUSIONS:**

a. Extensive air, water, and soil sampling indicates that the workplace is free of health hazards. We consider the work area to be a safe and healthy environment for your personnel.

b. We presented the results of our survey to 564 MS personnel on 14 and 15 November. It is important to ensure all missile crews are made aware of the results of this assessment, as it should alleviate many of the worries expressed prior to our study. We recommend providing a copy of this report, with attachments, and a copy of our briefing, to all squadron personnel. Possible avenues of distribution include posting on the 564 MS web site, providing copies in a read file, and sending via electronic mail to interested parties.

c. We would like to thank the 341st Medical Squadron and the 564th Missile Squadron personnel for outstanding support to our team during the visit. It was a true pleasure to work with such a highly professional group of people throughout the survey. The support they provided us was absolutely exceptional.

d. If you have any questions regarding this survey, or need any additional support regarding this issue, please contact the undersigned at DSN (b)(6) or (b)(6) at DSN (b)(6)

(b)(6)

Attachments:

1. Hazardous materials monitored during survey
2. LCC Diagram: Air Sampling Pump and IAQ Meter Location
3. Air sampling log
4. Carbon dioxide, temperature, and relative humidity measurements
5. Ventilation air flow rates
6. Water sampling results
7. Organophosphorous pesticide soil sample results
8. Herbicide soil sample results
9. Organochlorine pesticide soil sample results
10. Fact Sheet: Lymphoma
11. Fact Sheet: MAF Survey

cc: HQ AFSPC/SGPB

DEPARTMENT OF THE AIR FORCE
840TH STRATEGIC CLINIC (SAC)
MALMSTROM AIR FORCE BASE, MONTANA 59402-5300

REPLY TO ATTN OF: SGPB (b)(6) 3112)

28 March 1991

SUBJECT: Results of Asbestos Sampling

TO: 840 CES/DEEV

1. Results for asbestos air sampling at Hotel 2 Launch Facility (LF) have been received by this office. Unfortunately, the personal sample was torn and an accurate fiber count could not be made. The other results have been provided. All results are in fibers per cubic centimeter (f/cc) and the personal sample is stated as an 8 hr Time Weighted Average (TWA). Results are as follows:

	SAMPLE #	RESULT	STANDARD
Presample	910137	.01186	None
Area Sample	910139	.19968	None
Personal Sample	910139	Sample filter torn	N/A
Post Sample	910140	.02102	Lower than Presample

2. These results may indicate asbestos escaped the glove bag operation, may indicate asbestos was disturbed on nearby pipes, or may indicate dust and debris were disturbed in the area and detected as asbestos. Phase contrast microscopy (PCM) relies on counting fibers of a certain length to width ratio, so it is possible to count non-asbestos fibers as asbestos. Therefore it is important that glove bags are carefully performed to insure no asbestos can escape, but it is also important to insure dust and debris are minimized in the area of glove - bag removals. Before removals I recommend the area be inspected for dust and debris and HEPA vacuumed or wet mopped as appropriate. The floor and equipment could also be covered with plastic sheeting. Nearby pipes could be wrapped in plastic sheeting if they might be disturbed. Proper personal protective equipment (i.e., respirators, tyvex suit) was worn by Civil Engineering personnel performing the removal and should continue to be worn in all asbestos procedures.

3. The post sample results are well below the OSHA 8 hour TWA of 0.2 fibers per cubic centimeter. No exposure above OSHA permissible exposure levels are possible. Therefore further clean-up is not indicated. Additionally this area is not routinely occupied.

4. Due to the sample filter being torn on the personal sample and an accurate asbestos count not being able to be made, an 8 hour Time Weighted Average could not be determined.

5. If you have questions or comments about this or other sample results, please contact this office at ext (b)(6)

(b)(6)

Chief, Bioenvironmental Engineering

1 Atch
Sample Results

INDUSTRIAL HYGIENE SAMPLING DATA

OEHL USE ONLY

(Use this space for mechanical imprint)

WORKPLACE IDENTIFIER: 0124

BASE: Minot AFB MT ORGANIZATION: 810 CES

WORKPLACE: 45-12 LF

DATE COLLECTED (YYMMDD): 921020

BLDG NO./LOCATION: 12 SMS ROOM/AREA:

MAIL REPORTS TO (circle if changed): ORIGINAL; COPY 1: 810 CES/DEEV MAL-stop 11, Minot AFB, MT. 59702; COPY 2:

(b)(6)

REASON FOR SUBMISSION: H — A-ACCIDENT/INCIDENT C-COMPLAINT F-FOLLOWUP/CLEANUP R-ROUTINE/PERIODIC SURVEY O-OTHER (Specify)

OEHL FID:

SOURCE BEING SAMPLED: [illegible] Sewage Drain Pipe

EXISTING CONTROLS (Personal Protective Equipment, Engineering, Administrative): Glove, Boots, Coveralls

PRIORITY

SAMPLE COLLECTION DATA

EMPLOYEE NAME & SSAN OR SAMPLE LOCATION	POST SHIFT		
OEHL SAMPLE NO.			
BASE SAMPLE NO.	FY910140		
COLLECTING MEDIA	GW 500		
ANALYSES REQUESTED A NAME	Asbestos		
A NIOSH NO.			
B NAME			
B NIOSH NO.			
C NAME			
C NIOSH NO.			
D NAME			
D NIOSH NO.			
PUMP OR MONITOR NO.	3447		
COLLECTION TIME: OFF/ON	1405 / 1330	/	/
TOTAL COLLECTION TIME	35 min		
FLOW RATE: ON/OFF	3.1 / [illegible]	/	/
VOLUME SAMPLED	955 l		
TEMPERATURE/BAROMETER	52°F / 29.98	/	/
RELATIVE HUMIDITY/WIND	60% / 11	/	/
SUPPORTING SAMPLES OEHL SAMPLE NO.			
SUPPORTING SAMPLES BASE SAMPLE NO.			
SUPPORTING SAMPLES NOMENCLATURE			

COMMENTS: PRIORITY

SUMMARY OF SURVEY RESULTS (See reverse for calculations)

CALCULATED EXPOSURE CONCENTRATIONS	STANDARDS

AF FORM JAN 81 2750

AIR FORCE
OCCUPATIONAL AND ENVIRONMENTAL HEALTH LABORATORY
BROOKS AFB, TEXAS, 78235-5501

REPORT OF ANALYSIS

SAMPLE TYPE: AIR ASBESTOS

SITE IDENTIFIER: DATE RECEIVED: 910922

DATE COLLECTED: 910920 DATE REPORTED: 910926

DATE ANALYZED: 910925

SAMPLE SUBMITTED BY: 840 STRATEGIC CLINIC/SGPB

COPY TO: 840 CES/DEEV

ANALYSIS REQUESTED: Asbestos Fiber Count

METHODOLOGY: Optical Phase Contrast Microscopy
INSTRUMENTATION: Zeiss Phase Contrast Microscope

Analysis was performed by phase contrast optical microscopy in accordance with NIOSH Method 7400. This method is not a positive identification of asbestos but considers all fibers with a length to diameter ratio of 3 to 1 or greater and a length greater than 5 micrometers. The concentration shown below is based on the volume submitted. Corrections for fibers on the blank sample have not been made.

DEHL SAMPLE #	BASE SAMPLE #	VOLUME COLLECTED	FIBERS PER 100 FIELDS	CONCENTRATION FIBERS/CC
91009529	FX910140	455	19.6	.021

TO:

840 STRATEGIC CLINIC/SGPB
MALMSTROM AFB MT 59402-5360

PAGE 1 (Continued)

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 341ST SPACE WING (AFSPC)

18 Feb 03

MEMORANDUM FOR RECORD

FROM: 341 MDOS/SGOAB

SUBJECT: Asbestos Sampling at Tango Missile Alert Facility

On 5 Feb 03, I, (b)(6) received a phone call from (b)(6) of CE Environmental. (b)(6) informed me that a corrosion control team had gone to Tango MAF and believed that some insulation on a water pipe under the capsule, which had fallen off the pipe, was asbestos. He wanted to know if and what kind of sampling we (Bio) would like to conduct. I informed him that we would like to have a piece of the insulation so we could send it to AFIERA and verify if it was asbestos or not.

The following morning 6 Feb 03, I went to the corrosion control shop to interview the team that had reported the fallen insulation. I spoke with (b)(6) one of the team members. He informed me that the insulation on some of the piping under the capsule had fallen off and he believed that it contained asbestos. After the interview, I called (b)(6) again. (b)(6) informed me that a team from the Base Asbestos Abatement Team (BAAT) would be going out that day to do a cleanup. I wanted to go and conduct air sampling during the cleanup as well as get a sample of the insulation.

(b)(6) and myself went out to Tango. (b)(6) (b)(6) went under the capsule to evaluate the situation and give us a time frame of how long the cleanup would take. I had started my air sampling equipment before they went under the capsule. They returned after 5 minutes. (b)(6) gave me a small piece of insulation (about the palm of my hand) and stated that he didn't believe it was asbestos. This was the largest piece of insulation other than some dust. He stated that they were not going to do any cleanup. We all returned to base.

On 7 Feb 03, I sent the piece of insulation to AFIERA at Brooks City Base. I received the results on 12 Feb 03. The insulation contained 5 to 10% Chrysotile asbestos. I then called (b)(6) (b)(6) to inform them of the results. (b)(6) and I agreed that air sampling of the capsule should be conducted as soon as possible. I proceeded to have a dispatch filled out and prepared the equipment needed to conduct the sampling.

I called Tango MAF and informed them that the equipment, which I would be using, was not on the approved list of equipment that could enter the capsule. I was informed that I would need to have my commander talk to them about getting approval. I went to (b)(6) (341 MDOS commander) and informed him of what was happening and if he could be of assistance.

He contacted (b)(6) (564th MS commander) and proceeded to inform him that Bio needed to go to Tango to do air sampling and the equipment Bio would need to conduct the air sampling was not authorized in the capsule. (b)(6) then told (b)(6) that we could not go to the MAF due to other circumstances and to call back tomorrow.

At 1500 on 12 Feb 03 I was asked to be part of a meeting to talk about Tango MAF and what actions needed to be taken. (b)(6) and other personnel from CE Environmental, BAAT, and Contracting were present. (b)(6) asked me what requirements Bio had. I explained that the best course of action from Bio was to conduct air sampling in the capsule before any cleanup started in order to get a good idea of what could possibly be in the capsule. I would then conduct sampling on the cleanup team and one capsule crewmember. OSHA requires that sampling be conducted during the cleanup. I also explained that if the results came back with high levels, the entire capsule would require cleanup. I mentioned that the equipment I had wasn't authorized in the capsule and that something would need to be figured out on how I could get the equipment in. I was told to get with tech engineers for an approval letter. The meeting was adjourned.

I went back to (b)(6) to inform him what took place during the meeting and to let him know that (b)(6) should be informed of the potential health risk to the capsule crews on shift. While in conversation, (b)(6) called to ask what Bio needed to do and how soon. He stated that when we called earlier, he didn't know that the sampling was for the asbestos. He wanted me to bring any information I had on the equipment that was going to be used to his office ASAP. I finished the conversation with (b)(6) and went back to my office.

I gathered all the information I could find on the air sampling pump and preceded to building 500. I located (b)(6) and he took me to the maintenance commander. I left the info with him to work on the approval letter. I then briefed (b)(6) on everything that had taken place since 5 Feb. Within a half hour I was in a meeting with several group commanders including (b)(6) (b)(6) (the meeting was chaired by (b)(6).

I was asked for all information I had on the health hazards of asbestos and if I thought the capsule crew should be taken topside. I explained that I was not experienced enough to make that kind of command decision but that the potential was there. However, I stated that the risk was very low, due to the small amount of insulation containing a low percent of asbestos. (b)(6) (b)(6) (flight physician) also commented on the low risk. It was decided that the crew would come topside and the console would be shut down during the air sampling prior to cleanup. I also explained that by regulation all personnel in the cleanup area must have proper personal protective equipment on. The cleanup team would require an escort and these escort personnel would need to come to Bio and get fit tested on respirators prior to cleanup and that the BAAT would supply the masks and protective clothing required.

On 13 Feb 03, (b)(6) and myself dispatched to Tango MAF. We conducted a water sample; the sample was taken because the water lines had been worked on. (b)(6) was conducting a follow-up to make sure the water from the fixed line was safe for drinking. We setup the air sampling equipment, and then I went under the capsule and took pictures of the insulation and affected area. We returned to base.

On 14 Feb 03, (b)(6) and myself went to Tango MAF to conduct the air sampling during the cleanup. The cleanup team was (b)(6) We conducted three personal air sampling, one background sample upstairs and one area sample in the capsule. (b)(6) (b)(6) was researching the standard on sampling after cleanup. The Department of Environmental Quality (which is Montana State Law) states that if the cleanup area is less than three linier feet and is a glove bag removal there is no requirement for clearance sampling. (b)(6) (b)(6) contacted us at the MAF to let us know about the standard. (b)(6) agreed with Bio, there was no need to do a clearance sample. The clearance sample would have taken another 2-hours, which would have keep the capsule down that much longer.

After the cleanup was conducted, I again went down and took pictures of the cleaned area. All pictures were sent to (b)(6) We collected our equipment and returned to base. We contacted Northern Analytical Laboratories, located in Billings to find out if someone would be able to run the samples on a Saturday. AFIERA is closed on weekends and we needed a lab to run the samples. (b)(6) agreed to come in and run the samples. The samples were sent FED EX overnight to the lab. I came to work at 1030 on 15 Feb 03, to wait for the results. At 1420 (b)(6) called to say he was faxing the results. He informed me that everything was in order and all sample results were good.

I contacted (b)(6) and (b)(6) by phone and/or email to give them the results. All sample results were well below any regulated standard. American Conference of Governmental Industrial Hygienists (ACGIH) standard is 0.1 fiber per cubic centimeter (f/cc) for an 8-hour day, 40-hour week Time Weighted Average (TWA). Occupational Safety and Health Administration (OSHA) standard is also 0.1 f/cc TWA. OSHA standard also includes a ceiling limit, which is the maximum allowed exposure during a 30-minute time period of 1.0 f/cc. The highest result was a TWA 0.02 f/cc.

All sample results will be filed in the Tango MAF binder including this memorandum and copies will be filed in the 564th case file located in the Bioenvironmental Engineering office.

After further conversation with (b)(6) the rest of the 564th MS will be assessed and sampling of the insulation, at all MAF's under the capsule, will be conducted through joint efforts.

(b)(6)

USAF
NCOIC, Bioenvironmental Engineering

cc: Tango MAF

BULK MATERIAL SAMPLING DATA

OEHL USE ONLY

(Use this space for mechanical imprint)

WORKPLACE OR SITE IDENTIFIER

BASE: Malmstrom AFB MT.

ORGANIZATION:

WORKPLACE OR SITE: Delta 1 Machanical Room

DATE COLLECTED (YYMMDD): 19,0,0,8,2,4

BLDG. NO./LOCATION:

ROOM/AREA:

MAIL REPORTS TO (circle if change)

ORIGINAL: 0124 840 STRAT CLINIC/SGPB, Malmstrom AFB MT. 59402-530

COPY 1:

COPY 2:

(b)(6)

REASON FOR SUBMISSION: R — A-ACCIDENT/INCIDENT C-COMPLAINT F-FOLLOWUP/CLEANUP R-ROUTINE BACKGROUND/PERIODIC SURVEY O-OTHER

OEHL PID

SOURCE BEING SAMPLED # GM900502 Insulation From Pipes in the Delta 1 Machanical Room

~~EXISTING CONTROLS~~ (Personal protective equipment, Engineering, Administrative)

~~None~~ #GM900503 Insulation From Old Dental clinic Boiler Rm. Bldg. 1189

SAMPLE COLLECTION DATA

OEHL SAMPLE NO.				
BASE SAMPLE NO.			GM900502	GM900503
A	CHECK FOR		☐ MAJOR COMPONENTS	☐ MAJOR COMPONENTS
B	NAME		Asbestos	Asbestos
	NIOSH NO.		CI647500	CI647500
C	NAME			
	NIOSH NO.			
D	NAME			
	NIOSH NO.			
E	CHECK FOR		☐ HAZARDOUS/TOXIC WASTE	☐ HAZARDOUS/TOXIC WASTE
MATERIAL NAME				
LOT NUMBER				
NSN (FSN)				
SPECIFICATION (MIL or FED)				
MANUFACTURER'S NAME				
DESCRIPTON OF MATERIAL USAGE (Heated, brushed, sprayed, etc.)				
SUPPORTING SAMPLES	OEHL SAMPLE NO.			
	BASE SAMPLE NO.			
	SAMPLE TYPE			

COMMENTS

AF FORM JAN. 81 2751

AIR FORCE
OCCUPATIONAL AND ENVIRONMENTAL HEALTH LABORATORY
BROOKS AFB, TEXAS, 78235-5501

REPORT OF ANALYSIS

SAMPLE TYPE: BULK ASBESTOS

SITE IDENTIFIER: DATE RECEIVED: 901001

DATE COLLECTED: 900824 DATE REPORTED: 901005

DATE ANALYZED: 901003

This test report relates only to the items tested and listed on this report. This analysis was performed in accordance with the EPA 'Interim Method for the Determination of Asbestos in Bulk Insulation Samples' EPA 600/M4-82-020, Dec. 1982. (Asbestos by PLM)
OSHA Limit of Detection is 0.1% which is equivalent to the EPA Limit of Detection of <1%.

CONCENTRATIONS ARE ESTIMATED VALUES (Values reported 1 to 5% are considered to be greater than 1% but less than 5%)

OEHL #	BASE #		RESULTS (TOTAL PERCENT)
90060410	GM900502	Chrysotile	5% to 15%
90060411	GM900503	Chrysotile	15% to 30%

Comments:

SAMPLES WERE IMPROPERLY COLLECTED. SEE 1989 SAMPLING GUIDE (SECTION III, A6-7) FOR PROPER SAMPLING CONTAINERS, WITH CATALOG NUMBERS AND SAMPLING INSTRUCTIONS.

TO:

840 STRATEGIC CLINIC/SGPB
MALMSTROM AFB MT 59402-5300

ALL PURPOSE CHECKLIST	PAGE 1 OF 2 PAGES
TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA: BIOENVIRONMENTAL ENGINEERING - PCB SPILL	OPR: SGPB / DATE: 9 Nov 1988

NO.	ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

1. Obtain the following data:

Date 16 May 89
Time 1245
Location of spill: Site 0-9
Area Filter 19 LDB panel
Approximate amount of spill 1 lb
Name of individual in charge (b)(6)
Name of Team PMT

2. Has there been any personal contact with the substance? (If yes brief DECON procedures 7a (7v) and inform ER of situation) No

3. Are they going to clean up the spill at this time? Yes

4. If no, notify Job Control (Ext 3991) of the spill and recommend the next qualified team dispatching to this site take along a PCB spill clean-up kit and clean up the spill. (If yes, go to item #5)

Individual Contacted: _____ Time/Date _____

When the team is dispatched, have them call BEEs for a briefing. (Maintain this sheet until spill is cleaned-up).

Person in charge: _____ Time/Date _____

5. Do they have the following protective equipment:

a. Rubber gloves ✓
b. Rubber apron ✓
c. Face Shield ✓
d. Rubber boots ✓
e. Self-contained breathing apparatus for spills greater than 8 oz.

6. Do they have the following clean-up items?

a. Rags or sorbent ✓
b. PCB solvent (PD680) ✓
c. Plastic bags or drum ✓

7. If they have the appropriate protective equipment and clean-up items, proceed with the following briefing; if not advise not to clean-up.

a. Health Hazards: PCBs can gain entry to the body by three routes:

(1) Inhalation - Due to PCBs extremely low vapor pressure, the risk of inhalation is minimal unless they are heated or spilled in a confined space. If you have a spill of greater than 8 oz. or if the spill is in a confined area, recommend you wear self-contained breathing apparatus.

ALL PURPOSE CHECKLIST	PAGE 1 OF 2 PAGES

TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA	OPR	DATE
BIOENVIRONMENTAL ENGINEERING - PCB SPILL	SGPB	9 Nov 1988

NO.	ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

1. Obtain the following data:

   Date 9 Jun 89
   Time 1112
   Location of spill: Site Oscar 4
   Area ~~Bus Barracks~~ LDD Pond
   Approximate amount of spill Bindaker - minor
   Name of individual in charge (b)(6)
   Name of Team

2. Has there been any personal contact with the substance? (If yes brief DECON procedures 7a (7v) and inform ER of situation) NO

3. Are they going to clean up the spill at this time? NO

4. If no, notify Job Control (Ext 3991) of the spill and recommend the next qualified team dispatching to this site take along a PCB spill clean-up kit and clean up the spill. (If yes, go to item *5)

Individual Contacted: _____ Time/Date _____

When the team is dispatched, have them call BEEs for a briefing. (Maintain this sheet until spill is cleaned-up).

Person in charge: (b)(6) Time/Date 14 Jun 89 / 0950

5. Do they have the following protective equipment:

   a. Rubber gloves YES
   b. Rubber apron YES
   c. Face Shield YES
   d. Rubber boots NO
   e. Self-contained breathing apparatus for spills greater than 8 oz.

6. Do they have the following clean-up items?

   a. Rags or sorbent YES
   b. PCB solvent (PD680) YES
   c. Plastic bags or drum YES

7. If they have the appropriate protective equipment and clean-up items, proceed with the following briefing; if not advise not to clean-up.

   a. Health Hazards: PCBs can gain entry to the body by three routes:

   (1) Inhalation - Due to PCBs extremely low vapor pressure, the risk of inhalation is minimal unless they are heated or spilled in a confined space. If you have a spill of greater than 8 oz. or if the spill is in a confined area, recommend you wear self-contained breathing apparatus.

File Oscar

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TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA: BIOENVIRONMENTAL ENGINEERING - PCB SPILL

OPR: SGPB

DATE: 9 Nov 1988

NO.	ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

1. Obtain the following data:

   Date 12 July 89
   Time 0750
   Location of spill: Site Oscar 9
   Area Filter 23 2SBPond UBR
   Approximate amount of spill _____
   Name of individual in charge _____
   Name of Team _____

2. Has there been any personal contact with the substance? (If yes brief DECON procedures 7a (7v) and inform ER of situation)

3. Are they going to clean up the spill at this time?

4. If no, notify Job Control (Ext 3991) of the spill and recommend the next qualified team dispatching to this site take along a PCB spill clean-up kit and clean up the spill. (If yes, go to item #5)

   Individual Contacted: (b)(6) Time/Date 0900 12 Jul 89

   When the team is dispatched, have them call BEEs for a briefing. (Maintain this sheet until spill is cleaned-up).

   Person in charge: (b)(6) Time/Date 0750/12 Jul 89

5. Do they have the following protective equipment:

   a. Rubber gloves yes
   b. Rubber apron yes
   c. Face Shield yes
   d. Rubber boots _____
   e. Self-contained breathing apparatus for spills greater than 8 oz.

6. Do they have the following clean-up items?

   a. Rags or sorbent yes
   b. PCB solvent (PD680) yes
   c. Plastic bags or drum yes

7. If they have the appropriate protective equipment and clean-up items, proceed with the following briefing; if not advise not to clean-up.

   a. Health Hazards: PCBs can gain entry to the body by three routes:

   (1) Inhalation - Due to PCBs extremely low vapor pressure, the risk of inhalation is minimal unless they are heated or spilled in a confined space. If you have a spill of greater than 8 oz. or if the spill is in a confined area, recommend you wear self-contained breathing apparatus.

AF FORM JUN 84 2519 PREVIOUS EDITION WILL BE USED

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TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA: BIOENVIRONMENTAL ENGINEERING - PCB SPILL	OPR: SGPB / DATE: 9 Nov 1988

NO.	ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

1. Obtain the following data:

Date 6 Feb 90
Time 0700
Location of spill: Site OSCAR 1
Area LCC
Approximate amount of spill 10 x 10 ft
Name of individual in charge (b)(6)
Name of Team FOX 4

2. Has there been any personal contact with the substance? (If yes brief DECON procedures 7a (7v) and inform ER of situation) NO

3. Are they going to clean up the spill at this time? YES

4. If no, notify Job Control (Ext 3991) of the spill and recommend the next qualified team dispatching to this site take along a PCB spill clean-up kit and clean up the spill. (If yes, go to item #5)

Individual Contacted: _____ Time/Date _____

When the team is dispatched, have them call BEEs for a briefing. (Maintain this sheet until spill is cleaned-up).

Person in charge: (b)(6) Time/Date 6 Feb 90

5. Do they have the following protective equipment:

a. Rubber gloves ✓
b. Rubber apron ✓
c. Face Shield ✓
d. Rubber boots ✓
e. Self-contained breathing apparatus for spills greater than 8 oz.

6. Do they have the following clean-up items?

a. Rags or sorbent ✓
b. PCB solvent (PD680) ✓
c. Plastic bags or drum ✓

7. If they have the appropriate protective equipment and clean-up items, proceed with the following briefing; if not advise not to clean-up.

a. Health Hazards: PCBs can gain entry to the body by three routes:

(1) Inhalation - Due to PCBs extremely low vapor pressure, the risk of inhalation is minimal unless they are heated or spilled in a confined space. If you have a spill of greater than 8 oz. or if the spill is in a confined area, recommend you wear self-contained breathing apparatus.

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TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA	OPR	DATE
BIOENVIRONMENTAL ENGINEERING - PCB SPILL	SGPB	9 Nov 1988

NO.	ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

1. Obtain the following data:

Date 1 Aug 90
Time 1123
Location of spill: Site Oscar 1
Area 1 cc above capsule door
Approximate amount of spill teaspoon
Name of individual in charge (b)(6)
Name of Team Ex 5

2. Has there been any personal contact with the substance? (If yes brief DECON procedures 7a (7v) and inform ER of situation)

3. Are they going to clean up the spill at this time?

4. If no, notify Job Control (Ext 3991) of the spill and recommend the next qualified team dispatching to this site take along a PCB spill clean-up kit and clean up the spill. (If yes, go to item #5)

Individual Contacted: _____ Time/Date _____

When the team is dispatched, have them call BEEs for a briefing. (Maintain this sheet until spill is cleaned-up).

Person in charge: (b)(6) Time/Date 1123/1 Aug 90

5. Do they have the following protective equipment:

a. Rubber gloves ✓
b. Rubber apron ✓
c. Face Shield ✓
d. Rubber boots ✓
e. Self-contained breathing apparatus for spills greater than 8 oz.

6. Do they have the following clean-up items?

a. Rags or sorbent ✓
b. PCB solvent (FD680) ✓
c. Plastic bags or drum ✓

7. If they have the appropriate protective equipment and clean-up items, proceed with the following briefing; if not advise not to clean-up.

a. Health Hazards: PCBs can gain entry to the body by three routes:

(1) Inhalation - Due to PCBs extremely low vapor pressure, the risk of inhalation is minimal unless they are heated or spilled in a confined space. If you have a spill of greater than 8 oz. or if the spill is in a confined area, recommend you wear self-contained breathing apparatus.

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TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA: BIOENVIRONMENTAL ENGINEERING - PCB SPILL	OPR: SGPB / DATE: 9 Nov 1988

NO.	ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

1. Obtain the following data:

   Date 8 June 89
   Time 1420
   Location of spill: Site November 7
   Area LDB panel
   Approximate amount of spill 10Z
   Name of individual in charge (b)(6)
   Name of Team Fog 6

2. Has there been any personal contact with the substance? (If yes brief DECON procedures 7a (7v) and inform ER of situation) N6

3. Are they going to clean up the spill at this time?

4. If no, notify Job Control (Ext 3991) of the spill and recommend the next qualified team dispatching to this site take along a PCB spill clean-up kit and clean up the spill. (If yes, go to item #5)

Individual Contacted: _____ Time/Date _____

When the team is dispatched, have them call BEEs for a briefing. (Maintain this sheet until spill is cleaned-up).

Person in charge: _____ Time/Date _____

5. Do they have the following protective equipment:

   a. Rubber gloves ✓
   b. Rubber apron ✓
   c. Face Shield ✓
   d. Rubber boots ✓
   e. Self-contained breathing apparatus for spills greater than 8 oz.

6. Do they have the following clean-up items?

   a. Rags or sorbent ✓
   b. PCB solvent (PD680) ✓
   c. Plastic bags or drum ✓

7. If they have the appropriate protective equipment and clean-up items, proceed with the following briefing; if not advise not to clean-up. ✓

   a. Health Hazards: PCBs can gain entry to the body by three routes:

   (1) Inhalation - Due to PCBs extremely low vapor pressure, the risk of inhalation is minimal unless they are heated or spilled in a confined space. If you have a spill of greater than 8 oz. or if the spill is in a confined area, recommend you wear self-contained breathing apparatus.

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TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA: BIOENVIRONMENTAL ENGINEERING - PCB SPILL	OPR: SGPB / DATE: 9 Nov 1988

NO. | ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

1. Obtain the following data:

Date 16 Nov 90
Time 1100
Location of spill: Site Nov 3
Area under ESA door
Approximate amount of spill minor
Name of individual in charge (b)(6)
Name of Team Echo 22

2. Has there been any personal contact with the substance? (If yes brief DECON procedures 7a (7v) and inform ER of situation)

3. Are they going to clean up the spill at this time?

4. If no, notify Job Control (Ext 3991) of the spill and recommend the next qualified team dispatching to this site take along a PCB spill clean-up kit and clean up the spill. (If yes, go to item #5)

Individual Contacted: _____ Time/Date _____

When the team is dispatched, have them call BEEs for a briefing. (Maintain this sheet until spill is cleaned-up).

Person in charge: _____ Time/Date _____

5. Do they have the following protective equipment:

a. Rubber gloves √
b. Rubber apron √
c. Face Shield √
d. Rubber boots √
e. Self-contained breathing apparatus for spills greater than 8 oz.

6. Do they have the following clean-up items?

a. Rags or sorbent √
b. PCB solvent (PD680) √
c. Plastic bags or drum √

7. If they have the appropriate protective equipment and clean-up items, proceed with the following briefing; if not advise not to clean-up.

a. Health Hazards: PCBs can gain entry to the body by three routes:

(1) Inhalation - Due to PCBs extremely low vapor pressure, the risk of inhalation is minimal unless they are heated or spilled in a confined space. If you have a spill of greater than 8 oz. or if the spill is in a confined area, recommend you wear self-contained breathing apparatus.

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TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA	OPR / DATE
BIOENVIRONMENTAL ENGINEERING - PCB SPILL	SGPB / 9 Nov 1988

NO. | ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

1. Obtain the following data:

Date 2 Aug 91
Time 1515
Location of spill: Site November-11
Area SP 102 Control Panel, Lower LER
Approximate amount of spill Less than an Ounce
Name of individual in charge (b)(6)
Name of Team Fox-3

2. Has there been any personal contact with the substance? NO (If yes brief DECON procedures 7a (7v) and inform ER of situation)

3. Are they going to clean up the spill at this time? NO

4. If no, notify Job Control (Ext 3991) of the spill and recommend the next qualified team dispatching to this site take along a PCB spill clean-up kit and clean up the spill. (If yes, go to item #5)

Individual Contacted: (b)(6) Time/Date 1420/2 Aug 91
x4296

When the team is dispatched, have them call BEEs for a briefing. (Maintain this sheet until spill is cleaned-up).

Person in charge: _____ Time/Date _____

5. Do they have the following protective equipment:

a. Rubber gloves Yes
b. Rubber apron Yes
c. Face Shield Yes
d. Rubber boots Yes
e. Self-contained breathing apparatus for spills greater than 8 oz.

6. Do they have the following clean-up items?

a. Rags or sorbent Yes
b. PCB solvent (FD680) Yes
c. Plastic bags or drum Yes

7. If they have the appropriate protective equipment and clean-up items, proceed with the following briefing; if not advise not to clean-up.

a. Health Hazards: PCBs can gain entry to the body by three routes:

(1) Inhalation - Due to PCBs extremely low vapor pressure, the risk of inhalation is minimal unless they are heated or spilled in a confined space. If you have a spill of greater than 8 oz. or if the spill is in a confined area, recommend you wear self-contained breathing apparatus.

Memo for Record 22 April 1991

SUBJECT: Golf - 01 LCF Spill

1. On 18 April 1991, (b)(6) of the 840 Strategic Clinic, Bioenvironmental Engineering Section, was notified of a potential PCB spill at Golf 01, LCF via beeper at 0400 hours and again at 1715 hours. During the first notification, (b)(6) was advised that a clean-up team had dispatched to the field and would remain overnight and clean the spill in the morning. (b)(6) advised Wing Job Control to contact the Bioenvironmental office after 0730 hours before the team had begun cleaning so an appropriate briefing could be given. No contact with Wing Job Control or Golf 01 was made until 1715 hours when the second notification was made.

2. During the second notification, (b)(6) spoke with (b)(6) of Wing Job Control. (b)(6) advised that communications with Golf 01 were out with the exception of radio. (b)(6) also advised that (b)(6) the NCO in charge of the spill at G-01, would bring a sample for our review before clean-up began. (b)(6) briefed (b)(6) of PCB hazards and appropriate personal protective equipment. (b)(6) advised that he would brief (b)(6) before any clean-up or sampling attempt was made.

3. The leaking power filter was provided to us. The manufacturer of the filter, Genisco Tech Corporation, was notified that one of their power line filters, part number GF56846 SN# 1-2545 had broken and that a hard, brown substance had leaked out. Genisco Corp. informed Bioenvironmental Engineering that the substance was mineral oil and tar and that there were no PCBs present in the filter. Wing Job Control and the FMT team were notified that no PCBs were present and clean-up procedures began.

(b)(6)

Bioenvironmental Engineering Technician

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TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA	OPR	DATE
BIOENVIRONMENTAL ENGINEERING – PCB SPILL	SGPB	9 Nov 1988

NO. | ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

1. Obtain the following data:

Date 18 Apr 91
Time 1745
Location of spill: Site Gulf 1 LCF
Area Power Panel (Cabinet)
Approximate amount of spill Approx. 3 1/2 to 4 quarts Hard, Brown Sub
Name of individual in charge (b)(6)
Name of Team

2. Has there been any personal contact with the substance? (If yes brief DECON procedures 7a (7v) and inform ER of situation)

3. Are they going to clean up the spill at this time?

4. If no, notify Job Control (Ext 3991) of the spill and recommend the next qualified team dispatching to this site take along a PCB spill clean-up kit and clean up the spill. (If yes, go to item #5)

Individual Contacted: (b)(6) Time/Date 18 Apr 91/1730

When the team is dispatched, have them call BEEs for a briefing. (Maintain this sheet until spill is cleaned-up).

Person in charge: (b)(6) Time/Date

5. Do they have the following protective equipment:

a. Rubber gloves ✓
b. Rubber apron ✓
c. Face Shield ✓
d. Rubber boots ✓
e. Self-contained breathing apparatus for spills greater than 8 oz. ✓

6. Do they have the following clean-up items?

a. Rags or sorbent ✓
b. PCB solvent (PD680) ✓
c. Plastic bags or drum ✓

7. If they have the appropriate protective equipment and clean-up items, proceed with the following briefing; if not advise not to clean-up.

a. Health Hazards: PCBs can gain entry to the body by three routes:

(1) Inhalation - Due to PCBs extremely low vapor pressure, the risk of inhalation is minimal unless they are heated or spilled in a confined space. If you have a spill of greater than 8 oz. or if the spill is in a confined area, recommend you wear self-contained breathing apparatus.

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TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA: BIOENVIRONMENTAL ENGINEERING - PCB SPILL	OPR: SGPB / DATE: 9 Nov 1988

NO.	ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

1. Obtain the following data:

Date 10 APR 89
Time 1800
Location of spill: Site India 3
Area LEB Panel
Approximate amount of spill two Slim - (small)
Name of individual in charge (b)(6)
Name of Team Papa 2

2. Has there been any personal contact with the substance? (If yes brief DECON procedures 7a (7v) and inform ER of situation) No

3. Are they going to clean up the spill at this time? No

4. If no, notify Job Control (Ext 3991) of the spill and recommend the next qualified team dispatching to this site take along a PCB spill clean-up kit and clean up the spill. (If yes, go to item #5)

Individual Contacted: (b)(6) Time/Date 10 APR 89 / 1800

When the team is dispatched, have them call BEEs for a briefing. (Maintain this sheet until spill is cleaned-up).

Person in charge: _____ Time/Date _____

5. Do they have the following protective equipment:

a. Rubber gloves _____
b. Rubber apron _____
c. Face Shield _____
d. Rubber boots _____
e. Self-contained breathing apparatus for spills greater than 8 oz.

6. Do they have the following clean-up items?

a. Rags or sorbent _____
b. PCB solvent (PD680) _____
c. Plastic bags or drum _____

7. If they have the appropriate protective equipment and clean-up items, proceed with the following briefing; if not advise not to clean-up.

a. Health Hazards: PCBs can gain entry to the body by three routes:

(1) Inhalation - Due to PCBs extremely low vapor pressure, the risk of inhalation is minimal unless they are heated or spilled in a confined space. If you have a spill of greater than 8 oz. or if the spill is in a confined area, recommend you wear self-contained breathing apparatus.

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TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA	OPR	DATE
BIOENVIRONMENTAL ENGINEERING - PCB SPILL	SGPB	9 Nov 1988

NO.	ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

1. Obtain the following data:

   Date 13 July 89
   Time 1500
   Location of spill: Site I-10
   Area EMF Filter Bx
   Approximate amount of spill < 1 tsp
   Name of individual in charge (b)(6)
   Name of Team Papa 4

2. Has there been any personal contact with the substance? (If yes brief DECON procedures 7a (7v) and inform ER of situation) No

3. Are they going to clean up the spill at this time? Yes

4. If no, notify Job Control (Ext 3991) of the spill and recommend the next qualified team dispatching to this site take along a PCB spill clean-up kit and clean up the spill. (If yes, go to item #5)

Individual Contacted: _____ Time/Date _____

When the team is dispatched, have them call BEEs for a briefing. (Maintain this sheet until spill is cleaned-up).

Person in charge: _____ Time/Date _____

5. Do they have the following protective equipment:

   a. Rubber gloves Yes
   b. Rubber apron Yes
   c. Face Shield Yes
   d. Rubber boots ND
   e. Self-contained breathing apparatus for spills greater than 8 oz.

6. Do they have the following clean-up items?

   a. Rags or sorbent Yes
   b. PCB solvent (PD680) ND
   c. Plastic bags or drum Yes

7. If they have the appropriate protective equipment and clean-up items, proceed with the following briefing; if not advise not to clean-up.

   a. Health Hazards: PCBs can gain entry to the body by three routes:

   (1) Inhalation - Due to PCBs extremely low vapor pressure, the risk of inhalation is minimal unless they are heated or spilled in a confined space. If you have a spill of greater than 8 oz. or if the spill is in a confined area, recommend you wear self-contained breathing apparatus.

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TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA: BIOENVIRONMENTAL ENGINEERING - PCB SPILL	OPR: SGPB / DATE: 9 Nov 1988

NO.	ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

1. Obtain the following data:

Date 5 May 89
Time 0730
Location of spill: Site HOTEL 5
Area LDR TUNNEL
Approximate amount of spill UNK
Name of individual in charge (b)(6)
Name of Team Fox-11

2. Has there been any personal contact with the substance? (If yes brief DECON procedures 7a (7v) and inform ER of situation)

3. Are they going to clean up the spill at this time?

4. If no, notify Job Control (Ext 3991) of the spill and recommend the next qualified team dispatching to this site take along a PCB spill clean-up kit and clean up the spill. (If yes, go to item #5)

Individual Contacted (b)(6) Time/Date 5 May 89 0730

When the team is dispatched, have them call BEEs for a briefing. (Maintain this sheet until spill is cleaned-up).

Person in charge: _____ Time/Date _____

5. Do they have the following protective equipment:

a. Rubber gloves ✓
b. Rubber apron ✓
c. Face Shield ✓
d. Rubber boots NO
e. Self-contained breathing apparatus for spills greater than 8 oz.

6. Do they have the following clean-up items?

a. Rags or sorbent ✓
b. PCB solvent (PD680) ✓
c. Plastic bags or drum ✓

7. If they have the appropriate protective equipment and clean-up items, proceed with the following briefing; if not advise not to clean-up.

a. Health Hazards: PCBs can gain entry to the body by three routes:

(1) Inhalation - Due to PCBs extremely low vapor pressure, the risk of inhalation is minimal unless they are heated or spilled in a confined space. If you have a spill of greater than 8 oz. or if the spill is in a confined area, recommend you wear self-contained breathing apparatus.

ALL PURPOSE CHECKLIST	PAGE 1 OF 2 PAGES
TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA: BIOENVIRONMENTAL ENGINEERING - PCB SPILL	OPR: SGPB / DATE: 9 Nov 1988

NO.	ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

1. Obtain the following data:

Date 21 Nov 89
Time 1025
Location of spill: Site India 7
Area FMI panel
Approximate amount of spill < 8 oz
Name of individual in charge (b)(6)
Name of Team Papa 2

2. Has there been any personal contact with the substance? (If yes brief DECON procedures 7a (7v) and inform ER of situation)

3. Are they going to clean up the spill at this time?

4. If no, notify Job Control (Ext 3091) of the spill and recommend the next qualified team dispatching to this site take along a PCB spill clean-up kit and clean up the spill. (If yes, go to item #5)

Individual Contacted: _____ Time/Date _____

When the team is dispatched, have them call BEEs for a briefing. (Maintain this sheet until spill is cleaned-up).

Person in charge: (b)(6) Time/Date 1030/21 Nov 89

5. Do they have the following protective equipment:

a. Rubber gloves √
b. Rubber apron √
c. Face Shield √
d. Rubber boots √
e. Self-contained breathing apparatus for spills greater than 8 oz.

6. Do they have the following clean-up items?

a. Rags or sorbent √
b. PCB solvent (FD680) √
c. Plastic bags or drum √

7. If they have the appropriate protective equipment and clean-up items, proceed with the following briefing; if not advise not to clean-up.

a. Health Hazards: PCBs can gain entry to the body by three routes:

(1) Inhalation - Due to PCBs extremely low vapor pressure, the risk of inhalation is minimal unless they are heated or spilled in a confined space. If you have a spill of greater than 8 oz. or if the spill is in a confined area, recommend you wear self-contained breathing apparatus.

NO.	ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)			

(2) Ingestion - The risk of ingestion is also negligible if a face shield is worn and hands are washed immediately after clean-up is complete and before smoking or eating.

(3) Contact - The contact hazard is the most likely exposure, but can also be eliminated through the use of rubber gloves, aprons, boots, and face shields. Personnel should also wash with soap and water immediately after clean-up is complete.

b. Emergency Procedures - Any personnel who have PCBs splashed or spilled on them should be removed from the spill area, have their contaminated clothing removed and have the skin area washed thoroughly with soap and water for at least fifteen minutes. Eyes shall be irrigated immediately with copious quantities of water for at least fifteen minutes. Personnel will report to the Emergency Room when they return to the base.

c. Symptoms - If you experience any skin rash/blistering or irritation to the eyes, nose, or throat, you should report to the ER.

d. Clean-up Procedures

(1) Soak-up liquid spill with rags or sorbent and place in the designated PCB container.

(2) Wipe down area with rags damp with solvent. Repeat until oily residue is gone. Place these rags in container.

(3) Any grossly contaminated clothing should be placed in the container. Clothing with minimal contamination should be placed in plastic bags and returned to the base. These items should be washed separately from other items.

(4) Any contaminated protective equipment can be placed in plastic bags and returned to the base where it can be decontaminated with soap and water. These items can then be returned to the kits.

(5) The PCB container should be sealed and returned to the temporary storage area in Bldg 3081.

8. Once back on base, team leader should call SGPB to confirm clean-up completion.

(b)(6)

21Nov89
DATE

U.S. GOVERNMENT PRINTING OFFICE : 1983 O - 426-003

Cir. file
065 Hotel
(b)(6)

DEPARTMENT OF THE AIR FORCE
341ST MISSILE WING (AFSPC)

11 Jul 96

MEMORANDUM FOR 341 CES/DEV
490 MS/DO

FROM: 341 AMDS/SGPB

SUBJECT: Bulk Asbestos Sample (Hotel 1)

1. Bulk asbestos samples were taken by (b)(6) Bioenvironmental Engineering Services, on 2 Jul 96. This sample was taken from the generator room exhaust pipe. The results are provided to you as follows:

Area Sampled	% Amosite (asbestos)
Top Layer	3%
Bottom Layer	3%

Note: Any substance containing more than 1% Amosite is considered Asbestos Containing Material.

(b)(6)
BSC
Flight Commander, Bioenvironmental Engineering

4296

Rapt Alan 360 ~~4272~~

ALL PURPOSE CHECKLIST

ALL PURPOSE CHECKLIST	PAGE	OF	PAGES
TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA: BIOENVIRONMENTAL TEAM - PCB SPILL	OPR: SGPB		DATE: 1 MAY 85

NO. | ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

1. Obtain the following data:

   Date 20 Mar 89
   Time 01900 hrs
   Location of spill: Site Hotel 10
   Area ISB
   Approximate amount of spill 45" long 1/2" wide
   Name of individual in charge (b)(6)
   Name of team PAPA 3

2. Has there been any personal contact with the substance? NO

   (If yes, brief on decon procedures, i.e., remove contaminated clothing and wash with soap and water. Also have personnel stop at Emergency Room when they return to base. Contact the Emergency Room and inform them of the situation.
   Emergency Room individual contacted

   Time
   Date

3. Are they going to clean up the spill at this time? NO
   (If no, continue on. If yes, go to item #5.)

4. If no, notify Job Control (Ext 3991) of the spill and recommend the next qualified team dispatching to this site take along a PCB spill clean-up kit and clean up the spill.
   Individual contacted (b)(6)
   Time 20 Mar 89
   Date 1915

   When the team is dispatched, have them call BEEs for a briefing. (Save this infor sheet until spill is cleaned up.)
   Person in charge (b)(6)
   Time ~~24 MAR 89~~ 1100
   Date 24 MAR 89

5. Do they have the following protective equipment?

   a. Rubber gloves Yes
   b. Rubber apron Yes
   c. Face shield Yes
   d. Rubber boots Yes
   (Optional for small spill, i.e., less than 8 oz.)
   e. Self-Contained breathing apparatus

   (Only if spill is greater than 8 oz. or is in a confined area.)

AF FORM AUG 8-

NO.	ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

If they do not have appropriate protective equipment, advise them not to attempt clean-up.

5. Do they have the following clean-up items?

a. Rags or sorbent Yes
b. PCB solvent Yes
c. Plastic bags or drum Yes
(Any type of sealable container that is disposable.)

If they do not have appropriate clean-up items, advise them not to attempt clean-up.

7. If they have the appropriate protective equipment and clean-up items, proceed with the following briefing:

a. Health Hazards: PCBs can gain entry to the body through three routes. These are:

(i) Inhalation - Due to PCBs extremely low vapor pressure, the risk of inhalation is minimal unless they are heated or spilled in a confined space. If you have a spill of greater than 8 oz. or if the spill is in a confined area, recommend you wear self-contained breathing apparatus.

(ii) Ingestion - The risk of ingestion is also negligible if the following precautions are taken. A face shield is worn. Wash hands immediately after clean-up is complete and before smoking or eating.

(iii) Contact - The contact hazard is the most likely exposure, but can also be eliminated through the following actions. Use of rubber gloves, aprons, boots, and face shields. Personnel should also wash with soap and water immediately after clean-up is complete.

(iv) Emergency Procedures - Any personnel who have PCBs splashed or spilled on them should be removed from the spill area, have their contaminated clothing removed and have the skin area washed thoroughly with soap and water for at least fifteen minutes. Eyes shall be irrigated immediately with copious quantities of water for at least fifteen minutes. Personnel will report to the Emergency Room when they return to the base.

(v) Symptoms - Although the previously discussed protective measures should eliminate any exposure, if you experience any chloracne (a red elevated skin rash with blistering) or irritation to the eyes, nose, or throat, you should report to the

U.S. GOVERNMENT PRINTING OFFICE : 1983 O - 426-003

NO.	ITEM (Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)

Emergency Room to be evaluated.

b. Clean-Up Procedures

(i) Soak up liquid spill with rags or sorbent and place in a container.

(ii) Wipe down area with rags damp with solvent. Repeat until oily residue is gone. Place these rags in container.

(iii) Any grossly contaminated clothing should be placed in the container. Clothing with minimal contamination should be placed in plastic bags and returned to the base. These items should be washed seperately from other items.

(iv) Any contaminated protective equipment can be placed in plastic bags and returned to the base where it can be decontaminated with soap and water. These items can then be returned to the kits.

(v) The PCB container should be sealed and returned to the temporary storage area in Bldg 3081.

(b)(6)

SIGNATURE DATE

8. Have cleanup team notify us of cleanup completion.

CONTACTED By (b)(6) AT 1450. CLEAN-UP COMPLETE, NO PROBLEM (b)(6)

U.S. GOVERNMENT PRINTING OFFICE : 1983 O - 426-003

BULK MATERIAL SAMPLING DATA

(Use this space for mechanical imprint)

WORKPLACE OR SITE IDENTIFIER: 0124 XXXX 18SA

BASE: MALMSTROM AFB MT

ORGANIZATION: 43CES/DEV

WORKPLACE OR SITE: H-1 and J-1 LCFs

TAKEN FOR DEV BY DEV

DATE COLLECTED (YYMMDD): 921109

BLDG NO/LOCATION: H-1 & J-1

ROOM/AREA: MECH ROOM

MAIL REPORTS TO — ORIGINAL: 0124 — COPY 1:

43 MEDGP/SGPB Malmstrom AFB MT 59402

(b)(6)

REASON FOR SUBMISSION: O — A-ACCIDENT, INCIDENT C-COMPLAINT F-FOLLOWUP/CLEANUP R-ROUTINE BACKGROUND/PERIODIC SURVEY O-OTHER Emergency JOB

OEHL PID:

SOURCE BEING SAMPLED: GENERATOR UNDER STOP

EXISTING CONTROLS (Personal protective equipment, Engineering, Administrative): NONE

SAMPLE COLLECTION DATA

OEHL SAMPLE NO			
BASE SAMPLE NO		GM920574	GM920575
A	CHECK FOR	☐ MAJOR COMPONENTS	☐ MAJOR COMPONENTS
B	NAME	ASBESTOS CONTENT	ASBESTOS CONTENT
	NIOSH NO.	13322114	13322114
C	NAME		
	NIOSH NO.		
D	NAME		
	NIOSH NO.		
E	CHECK FOR	☐ HAZARDOUS/TOXIC WASTE	☐ HAZARDOUS/TOXIC WASTE
MATERIAL NAME			
LOT NUMBER			
NSN (FSN)			
SPECIFICATION (MIL or FED)			
MANUFACTURER'S NAME			
DESCRIPTION OF MATERIAL USAGE (Heated, brushed, sprayed, etc.)			
SUPPORTING SAMPLES	OEHL SAMPLE NO.		
	BASE SAMPLE NO.		
	SAMPLE TYPE		

COMMENTS: TYPE & Content of asbestos please. PHONE 632-7406 ASAP Please.

AF FORM 2751 JAN 81 — ORIGINAL

632-3626

MEMORANDUM FOR THE RECORD
19 Apr 97

On 18 Apr 97 at 1700 hours the Command Post phoned my home to inform me of an incident at Missile Alert Facility Golf which began at 1500 hours. A contractor applied a PVC pipe sealant to sewage connections in the MAF clean ventilation room. This sealant was applied without notifying the capsule crew, allowing the vapors to be vented directly to the capsule. This vapor concentration was high enough to cause mild central nervous system effects, to include dizziness and slight head aches. The crew affected by these symptoms include (b)(6) both from 341 OG/OGV. (b)(6) (b)(6) elected to evacuate the capsule and wait for the chemical concentrations to dissipate. I asked if the crew commander would like for our office to respond. (b)(6) (b)(6) decided that he did not require our assistance. I instructed (b)(6) to phone my office when he took occupancy of the capsule later that night. (b)(6) phoned my home at 2200 hours to inform me he had re-entered the capsule and did not smell the material any longer.

On 19 Apr 97 at 1500 hours Golf Capsule called the Medical Group to request our assistance. I phoned out to the MAF and spoke with a new crew of missileers. (b)(6) (b)(6) was the Flight Commander and requested my office come out and evaluate the capsule. At approximately 1600 hours (b)(6) and I arrived at Golf and surveyed the elevator shaft and the capsule for Methyl Ethyl Ketone, the primary organic in the sealant. Oxygen, Lower Explosive Limit, Nitrogen Dioxide and Sulfur Dioxide were also sampled. There were no measurable levels of MEK, Nitrogen Dioxide and Sulfur Dioxide. Oxygen and LEL were at acceptable levels (Oxygen 20.9% and LEL 0). Additionally I crawled beneath the capsule where water collects and creates objectionable vapors. This area was free from any moisture and no odor was observed. At 1640 hours we departed the MAF and the crew re-occupied the MAF. At 1900 hours I phoned (b)(6) (b)(6) to ask if he experienced any symptoms or smelled any thing out of the ordinary. Negative reply.

(b)(6)
USAF, BSC
Commander, Bioenvironmental Engineering

(b)(6)
USAF
Bioenvironmental Engineering
Journeyman, 4B051

File 11-04

(b)(6)

INDUSTRIAL HYGIENE SAMPLING DATA

(Use this space for mechanical imprint)

OEHL USE ONLY

WORKPLACE IDENTIFIER 0 1 2 4 [redacted] 0 4 5 6

BASE: Malmstrom AFB MT — ORGANIZATION: 341 CES

WORKPLACE: Quality LCF

DATE COLLECTED (YYMMDD): 9 1 0 1 0 2 0 1 — BLDG NO./LOCATION: LCF 5645MS — ROOM/AREA: Warehouse

MAIL REPORTS TO (circle if changed): ORIGINAL 0 1 2 [redacted] — COPY 1 — COPY 2 — 810 Street Clerk/SGPB Malmstrom AFB, MT 59402

SAMPLE COLLECTED BY (Name, grade, AFSC): (b)(6) — SIGNATURE — AUTOVON

REASON FOR SUBMISSION: H — A-ACCIDENT/INCIDENT C-COMPLAINT F-FOLLOWUP/CLEANUP R-ROUTINE/PERIODIC SURVEY O-OTHER (Specify)

SOURCE BEING SAMPLED: PRIORITY

EXISTING CONTROLS (Personal Protective Equipment, Engineering, Administrative): Glove Bag, TYVEK, [illegible]

SAMPLE COLLECTION DATA

EMPLOYEE NAME & SSAN OR SAMPLE LOCATION	Pos Sample Clearance
OEHL SAMPLE NO.	91006394
BASE SAMPLE NO.	CX 9101 05
COLLECTING MEDIA	MIX 500
ANALYSES REQUESTED A NAME	Asbestos
A NIOSH NO.	13322 14
B NAME / NIOSH NO.	
C NAME / NIOSH NO.	
D NAME / NIOSH NO.	
PUMP OR MONITOR NO.	08263
COLLECTION TIME: OFF/ON	1342 / 1250
TOTAL COLLECTION TIME	52
FLOW RATE: ON/OFF	3 L/m / 3 L/m
VOLUME SAMPLED	156 l
TEMPERATURE/BAROMETER	64°F / 29.55 inHg
RELATIVE HUMIDITY/WIND	23 % / N/A
SUPPORTING SAMPLES: OEHL SAMPLE NO.	
BASE SAMPLE NO.	
NOMENCLATURE	

COMMENTS: PRIORITY

(b)(6)

SUMMARY OF SURVEY RESULTS (See reverse for calculations)

CALCULATED EXPOSURE CONCENTRATIONS | STANDARDS

AF FORM JAN 81 2750

CALIBRATION RECORDS

PUMP	MANUFACTURER	SERIAL NUMBER
A		
B		
C		

		PRESURVEY	POSTSURVEY
DATE AND TIME		Y Y M M D D ⌊⌋⌊⌋⌊⌋ ⌊⌋⌊⌋⌊⌋⌊⌋ hours	Y Y M M D D ⌊⌋⌊⌋⌊⌋ ⌊⌋⌊⌋⌊⌋⌊⌋ hours
LOCATION/ TEMP & ALT			
VOLTAGE CHECKED		☐ YES ☐ NO ☐ N A	☐ YES ☐ NO ☐ N A
CALIBRATION METHOD			
FLOW RATE	PUMP A		
	PUMP B		
	PUMP C		
CALIBRATOR'S NAME			
CALIBRATOR'S AFSC			

LOCAL GRAVIMETRIC DETERMINATIONS

BASE SAMPLE NO					
FINAL WEIGHT					
INITIAL WEIGHT					
NET WEIGHT					

PERSONAL EXPOSURE DATA

CONTAMINANT	HOURS PER DAY	DAYS PER WEEK
A		
B		
C		
D		
E NONE		

CALCULATIONS *(8 hr TWA, STEL, etc.)*

AIR FORCE
OCCUPATIONAL AND ENVIRONMENTAL HEALTH DIRECTORATE
BROOKS AFB, TEXAS, 78235-5000

REPORT OF ANALYSIS

SAMPLE TYPE: ASBESTOS

SITE IDENTIFIER: MIXX065B

DATE COLLECTED: 910207

DATE ANALYZED: 910213

DATE RECEIVED: 910212

DATE REPORTED: 910220

DATE REPRINTED: 920318

ANALYSIS REQUESTED: Asbestos Fiber Count

METHODOLOGY: Optical Phase Contrast Microscopy
INSTRUMENTATION: Zeiss Phase Contrast Microscope

Analysis was performed by phase contrast optical microscopy in accordance with NIOSH Method 7400. This method is not a positive identification of asbestos but considers all fibers with a length to diameter ratio of 3 to 1 or greater and a length greater than 5 micrometers. The concentratic shown below is based on the volume submitted. Corrections for fibers on the blank sample have not been made.

OEHL SAMPLE #	BASE SAMPLE #	VOLUME COLLECTED	FIBERS PER 100 FIELDS	CONCENTRATION FIBERS/CC
91006394	EX910105	156	92	.28923

Analyzed by: _____

(b)(6) USAF
Technician

Reviewed by: _____

(b)(6)
Chief, Asbestos & Particle Analysis

TO:

301 AEROSPACE MED GRP/SGPB
MALMSTROM AFB, MT 59402-5300

SGPM

DEPARTMENT OF THE AIR FORCE
840TH STRATEGIC CLINIC (SAC)
MALMSTROM AIR FORCE BASE, MONTANA 59402-5300

REPLY TO ATTN OF: SGPB

12 December 1989

SUBJECT: Radiofrequency Radiation Hazards at Launch Control Facilities (LCF's)

TO: 341 SMW/DO-24 ([b)(6)]

1. At your request, I have re-evaluated the radiofrequency radiation (RFR) hazard at launch control facilities (LCF's). RFR hazard warning signs are no longer required on the topside UHF missile radio antenna cover. However, you should incorporate a warning to avoid the antenna into your site safety briefing as discussed below.

2. RFR Hazards:

a. Four radio systems use the ground level antenna at the LCF's:

Radio	Location
(1) AN GRC - 208 UHF Radio System	LCF's A-1 thru O-1
(2) AN GRC - 131 UHF Radio System	LCF's P-0, Q-0, R-0, S-0
(3) AN GRC - 172 UHF Radio System	LCF T-0
(4) RT-1264(v) 4/ARC-171 X (v) UHF Transceiver	Each LCF

The first three systems ((1), (2) and (3)) are voice transmitters. The estimated hazard distances are within 18" of the antenna. Actual transmission times will be very short, so the hazard distance will likely be shorter. Actual measurements on the AN-GRC-208 indicate the hazard distance is less than one foot from the cone. For the fourth system, the RT1264, the estimated hazard distance is 2.4 ft. However, transmissions from this transmitter are infrequent but never more than 5.4 seconds long every 5.4 minutes.

b. Permissible exposure limits (PEL's) for RFR are based on limiting the total body absorbed power to a specific absorption rate (SAR) of 0.4 watts per kilogram or less as averaged over any six minute period. Continuous transmissions from a voice transmitter are unlikely, so the hazard is considerably reduced or eliminated due to short transmission times. Similarly, transmission times are very short for the RT1264.

3. Due to the short transmission times associated with the missile radios and the very short estimated hazard distance from the antenna, exposure to RFR in excess of the PEL is unlikely. According to the non-ionizing radiation consultant at the Air Force Occupational Environmental Health Laboratory (AFOEHL) there may be an electrical shock hazard to a well grounded person very close to or touching the antenna during transmission. Again, this is an unlikely occurrence. However, to minimize potential hazards, I recommend the following information be incorporated

into the safety briefing you give to personnel entering the site: 'Do not approach within three feet of the Fiberglas cone on site. It is the missile radio antenna cover. While transmitting, a potential electrical shock or radiofrequency radiation hazard could exist.'

4. The hazard from the missile radio antenna at LCF's is minimal. However, to further minimize even the slight potential hazard, I've recommended you brief personnel to avoid the antenna cover. If you have any questions, please contact me at ext (b)(6)

(b)(6)

Chief, Bioenvironmental Engineering

cc: 40 AD/SE
2153CS/LGI
/LGVC
840 Strat Clinic/SGPM