

File

JUL 17 1985

Department of the Army
ATTN: Darwin N. Taras
Chief, Health Physics
Safety Office
Headquarters, U.S. Army
Material Command
5001 Eisenhower Avenue
Alexandria, VA 22333-0001

Gentlemen:

This refers to your letter dated February 25, 1985, requesting an amendment of Source Material License Number STB-1433, U.S. Army Aviation Systems Command, St. Louis, Missouri. After reviewing your request, we find we need the following additional information and clarification concerning your air sampling and respirator program.

1. We need to know if any of the reported fifty-one air samples were collected at the breathing zone level. Please clarify.
2. We need to know your method of determining air-borne particle size.
3. We need a detailed description of the facilities where the air samples were collected. For example, the welding shop, is this area in an open warehouse type building. Please explain.
4. Please provide a description of your engineering controls, (i.e., dust collectors, filter systems, exhaust tubes, etc.).

Our review of your request will continue upon receipt of the above information. Please reply in duplicate and reference Control No. 24919.

Sincerely,

Original Signed By
James W. Patterson
Original Signed By
J.W. Patterson
Materials Licensing Section

8602190654 851217
REG3 LIC40
STB-1433 PDR

RIII *[Signature]*
Patterson/cm
05/20/85

RIII *[Signature]*
Mallett
05/20/85



DEPARTMENT OF THE ARMY
HEADQUARTERS, US ARMY AVIATION SYSTEMS COMMAND
4300 GOODFELLOW BOULEVARD, ST. LOUIS, MO. 63120-1798

REPLY TO
ATTENTION OF

16 SEP 1985

AMSAV-X

SUBJECT: Amendment of NRC Source Material License STB-1433
(Control No. 24919)

Commander
U.S. Army Materiel Command
ATTN: AMCSF-P
5001 Eisenhower Avenue
Alexandria, VA 22333-0001

1. Reference letter, 17 July 1985, NRC Region III, requesting additional information pursuant to subject license amendment request.
2. The following information is provided in response to questions asked by the NRC in the referenced letter:

a. Air sampling data supplied to the NRC to support eliminating the respiratory protection requirement included both breathing zone and general area samples. Samples are identified by annotation in the "BZ" or "GA" columns, as applicable, for breathing zone and general area samples, respectively.

b. Airborne particle sizing has not been accomplished for the licensed magnesium-thorium alloy maintenance. The small amount of total airborne material precludes the ability to conduct accurate particle sizing of the licensed maintenance. (Air sample results are generally less than the lower limit of detection even for operations such as grinding which generate far greater amounts of airborne material than those authorized by the subject license.)

c. At the time that the air sampling study was accomplished, all operations were located in a large, open warehouse-type building. Welding was accomplished inside a curtained welding booth and utilized a ventilation system which consisted of blowers with hepa filters and/or electrostatic precipitators and movable ducting so that the inlet to the duct could be located immediately adjacent to/above the welding being performed. All other operations were accomplished in large open areas without engineering controls such as ventilation systems. Bead blasting was, however, accomplished inside glove boxes (without separately filtered exhaust systems). Although most magnesium-thorium operations at Corpus Christi Army Depot are now conducted in separate areas, at the time that the air sampling was performed they were not segregated from other routine machine shop type operations being conducted on other alloys.

AMSAV-X

SUBJECT: Amendment of NRC Source Material License STB-1433
(Control No. 24919)


3. Limited additional air sampling data is attached as further documentation of the levels of airborne radioactivity while helicoil replacement is being conducted. These air samples were obtained immediately above and adjacent to the work being performed in order to safe side results. The area utilized for the maintenance was a small room inside an aircraft hanger. No ventilation system or other engineering controls were utilized.

4. The air sampling data provided to the Nuclear Regulatory Commission contained results of air sampling accomplished while welding, machining, grinding, and bead blasting. It should be emphasized that authorization to perform these operations is not being requested. Further, the operations which are being performed, hand sanding, hand grinding, drilling, hand tapping, chemical removal of corrosion and reapplication of protective coatings, would be expected to generate much less airborne material than many of the operations which were sampled. These operations are also performed on a much less frequent basis than at CCAD thus the exposures associated with the maintenance authorized by the AVSCOM license would be very much less than the low exposures which were determined to exist at CCAD.

5. Control Number 24919 is referenced. Point of contact for additional information is Mr. Dennis Chambers, commercial (314) 263-1363, AUTOVON 693-1363.

FOR THE COMMANDER:

Encl
Test Reports of the
Particulate Radioactivity


NORBERT R. KNIEPP
Acting Chief
Safety Office



DEPARTMENT OF THE ARMY
US ARMY BELVOIR RESEARCH & DEVELOPMENT CENTER
FORT BELVOIR, VIRGINIA 22060

STRBE-VR

24 September 1984

SUBJECT: Test Report of the Particulate Radioactivity

Report No. 84/021/RVRY-11

Requested by: Mr. Dennis Chambers
US Army Troop Support Command
ATTN: DRSTS-XS
4300 Goodfellow Blvd
St. Louis, MO 63120

Authority: A42092HP421

1. Summary of the report. The air filter sample does not contain any detectable level alpha and beta particulate radioactivity.
2. Received two glass fiber type AE filters of diameter gcms (63.6 cm^2 area) for particulate gross alpha and beta type radioactivity. One of the filters was marked as background filter through which 704 ft^3 (19.94 m^3) of air had passed in the field and this filter was given a BRADC ID # 0000092. The other filter which was marked as a sample filter, 704 ft^3 (19.94 m^3) of the work shop ambient air (while repairing 3 helicoil inserts on Mg-Th alloy) had passed through and this filter was given a BRADC ID # 0000093.
3. Filters were cut into a smaller circle of diameter 5 cm. (19.6 cm^2 area) for counting purpose. Assuming that the particulate deposition was uniform, the volume of air passed through 5cm diameter filter was 6.14 m^3 .
4. Air filter samples were analyzed for total alpha and beta particulate radioactivity by using Tennenlac LB 5100, low background gas proportional counter. The efficiency for filter paper geometry for alpha and beta particulate radioactivity for Tennenlac LB 5100 was obtained by counting old EPA Las Vegas cross check air filter samples with known values.
5. Table 1 gives the actual count rates obtained in the Tennenlac LB-5100.

* Belvoir Research and Development Center

5. Detection Limit $L_D = 2.71 + 4.65\sqrt{3}$

where 3 is the total background counts.

Total counts needed for detection = $B + L_D$.

a. L_D for alpha = $2.71 + 4.65 \sqrt{0.15 \times 200}$
 (#0000183)
 = 28.18 total counts

Total counts needed for alpha particle detection

= $B + L_D = 30 + 28.18 = 58.2$

Count rate needed for alpha particle detection

= $\frac{58.2 \text{ counts}}{200} = 0.29 \text{ cpm}$

b. L_D for beta = $2.71 + 4.65 \sqrt{4.16 \times 200}$
 (#0000183)
 = 136.8 total counts

Total counts needed for beta particle detection

= $B + L_D = 832 + 136.8 = 968.8$

Count rate needed for beta particle detection

= $\frac{968.8 \text{ counts}}{200 \text{ minutes}} = 4.8 \text{ cpm}$

6. As Mg-Th workshop area filter ID #0000093 has 0.18 cpm of alpha particles and 3.7 cpm beta particles, the sample does not have any detectable radio-activity.

7. If you have any questions, the point of contact is Dr. R. K. Bhat, AUTOVON 354-5437.

SUBMITTED BY:

R. K. Bhat
 R. K. BHAT
 Radiation Research Group

APPROVED BY:

Robert C. McMILLAN
 ROBERT C. McMILLAN
 C, Radiation Research Group

FORWARDED BY:

Emil J. York
 EMIL J. YORK
 Director, Materials, Fuels and
 Lubricants Laboratory

TABLE 1 Sample count rates obtained from Tennelac LB 5100 for 200 minutes counting time.

BRADC ID #	SAMPLE DESCRIPTION	COUNT RATE	
		cpm Alpha	cpm Beta
0000092	Background air filter.	0.23	3.72
0000093	Mg-Th alloy workshop air filter	0.18	3.72
0000183	Whatman 50 filter. (Blank)	0.15	4.16
0000056	Standard EPA air filter, 27.1 + 11.7 pCi alpha, 59.2 + 8.7 pCi beta	18.09	59.31
0000181	Standard EPA air filter 26 + 11.2 pCi alpha, 68 + 8.7 pCi beta	16.46	68.73
0000182	Standard EPA air filter 13 + 8.7 pCi alpha, 36 + 8.7 pCi beta	8.89	38.92



DEPARTMENT OF THE ARMY
US ARMY BELVOIR RESEARCH & DEVELOPMENT CENTER
FORT BELVOIR, VIRGINIA 22060

STRBE-VR

24 September 1984

Subject: Test Report of the Particulate Radioactivity

Report No. 84/021/RVRY-13

Requested by: Mr. Dennis Chambers
US Army Troop Support Command
ATTN: DRSTS-XS
4300 Goodfellow Blvd
St. Louis, MO 63120

Authority: A42892HP421

1. Summary of the report. The air filter sample does not contain any detectable level alpha and beta particulate radioactivity.
 2. Received two filter papers of diameter 9cms (63.6 cm^2 area) for particulate gross alpha and beta radioactivity. One of the filter was marked as background filter through which 202 ft^3 (5.7 m^3) of air had passed through at Connecticut AVCRAD on 25 June 84, and this filter was given a BRADC ID # 0000094. The other filter which was marked as the sample filter, 202 ft^3 (5.7 m^3) of the workshop ambient air (while repairing 3 helicoil repairs at Connecticut AVCRAD on 25 June 84) had passed through and this filter was given a BRADC ID # 0000095.
 3. Filters were cut into a smaller circle of diameter 5cm (19.6 cm^2 area) for counting purposes. Assuming that the particulate deposition was uniform, the volume of air passed through 5cm diameter filter was 1.76 m^3 .
 4. Air filter samples were analyzed for total alpha and beta particulate radioactivity by using Tennenac LB 5100, low background gas proportioned counter. The efficiency for filter paper geometry for alpha and beta particulate radioactivity for Tennenac-LB-5100 was obtained by counting old EPA Las Vegas cross check air filter samples with known values.
 5. Table 1 gives the actual count rates obtained in the Tennenac LB 5100.
- * BRADC - Belvoir Research and Development Center

Table 1

Sample count rates obtained from Tennesse LB 5100 for 200 minutes counting time.

BRADC ID #	Sample Description	Count rate	
		cpm Alpha	cpm Beta
0000094	Background air filter at Connecticut AVCRAD	0.20	3.55
0000095	Workshop air filter at Connecticut AVCRAD	0.09	3.30
0000183	Whatman 50 filter (Blank)	0.15	4.16
0000056	Standard EPA air filter 27.1 \pm 11.7 pCi alpha 59.2 \pm 8.7 pCi beta	18.09	59.31
0000181	Standard EPA air filter 26 \pm 11.2 pCi alpha 68 \pm 8.7 pCi beta	16.46	68.73
0000182	Standard EPA air filter 13 \pm 8.7 pCi alpha 36 \pm 8.7 pCi beta	8.89	38.92

5. Detection Limit $L_D = 2.71 + 4.65 \sqrt{B}$

where B is the total background counts.

Total counts needed for detection = $B + L_D$

a. L_D for alpha = $2.71 + 4.65 \sqrt{0.15 \times 200}$

(# 0000183) = 28.18 total counts

Total counts needed for alpha particle detection = $B + L_D = 30 + 28.18 = 58.2$

Count rate needed for alpha particle detection

= $\frac{58.2 \text{ counts}}{200 \text{ min}} = 0.29 \text{ cpm}$

b. L_D for beta = $2.71 + 4.65 \sqrt{4.16 \times 200}$

(# 0000183) = 136.8 total counts

Total counts needed for beta particle detection

$$= 3 + L_D = 832 + 136.8 = 968.8$$

Count rate needed for beta particle detection

$$= \frac{968.8 \text{ counts}}{200 \text{ minutes}} = 4.8 \text{ cpm}$$

6. As workshop area filter ID #0000095 has 0.09 cpm of alpha particles and 3.30 cpm beta particles, the sample does not have any detectable radioactivity.

7. If you have any questions, the point of contact is Dr. R. K. Bhat, AUTOVON 354-5437.

SUBMITTED BY:

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