

EDO Principal Correspondence Control

FROM: DUE: 02/08/07

EDO CONTROL: G20070006
DOC DT: 12/03/06
FINAL REPLY:

James Salsman
Mountain View, California

TO:

Reyes, EDO

FOR SIGNATURE OF :

** GRN **

CRC NO:

Miller, FSME

DESC:

ROUTING:

2.206 - Pyrophoric Uranium Munitions

Reyes
Virgilio
Kane
Silber
Johnson
Burns
Cyr, OGC
Mensah, NRR
Jones, OGC

DATE: 01/05/07

ASSIGNED TO:

CONTACT:

FSME

Miller

SPECIAL INSTRUCTIONS OR REMARKS:

Ref. G20060666.

Template: EDO-001

E-RIDS: EDO-01

From: "James Salsman" <james@readsay.com>
To: "Luis A. Reyes" <LAR1@nrc.gov>
Date: 12/03/2006 12:35:59 AM
Subject: Updated 10 CFR 2.202 petition

2 December 2006

Luis A. Reyes
Executive Director for Operations
U.S. Nuclear Regulatory Commission
BY EMAIL AS PER 10 CFR 2.206(a)

Dear Mr. Reyes:

In accordance with Margaret Federline's offer of August 10, 2006, I am resubmitting this petition, derived from my petition of 12 July 2006, with additional significant new information appended. At present I have a federal qui tam court case pending against the NRC pertaining to my petition of 12 July 2006. I hope that submitting this updated petition may serve to expedite settlement of that case, N. Cal. Dist. case number C06 07173.

Pursuant to 10 CFR 2.202, I request that all licenses allowing the possession, transport, storage, or use of pyrophoric uranium munitions be modified to impose enforceable conditions on all such licensees as described below, and any other corrective action as deemed proper by the Commission.

Further information has come to light since my petition of 3 April 2005, as amended 26 April 2005, and further amended 19 October 2005, which I incorporate in its entirety by reference to its web location:
<http://www.bovik.org/du/du-petition.html>

For example, the petition of 3 April 2005 as amended did not include any information from the new scientific and medical references [1], [2], [3], [6], [7], [8], [12], [13], and [14] below. As you are aware, when new information previously unavailable comes to light, new 10 CFR 2.202 petitions similar to previous petitions must be considered.

The basis for this request is the gross negligence on the part of the licensees, in, among other things, failing to ever measure the gaseous products of uranium combustion and thereby failing to establish the correct toxicological profile of uranium combustion product exposure.

As the Office of the Secretary of Defense's own Depleted Uranium Environmental Exposure Report states: "when DU burns, the high temperatures created act to oxidize uranium metal to ... uranium trioxide (UO₃)" [1]

Recently, I have exchanged emails with Dr. Carl Alexander at Battelle (telephone 614-424-5233), who recently published a very important paper in uranium trioxide gas thermodynamics. [2] Dr. Alexander's reply [3] has convinced me that the urine tests used for DU exposure testing are misleading, and that it is essential to measure the

amount of UO₃ gas produced by uranium munitions, not just the particulate solids.

UO₃ gas is produced when uranium burns. Most of it condenses and decomposes into U₃O₈, which comprises 75% of the solid particulate combustion product. [4] However, some of the UO₃(g) will escape into the air before it can condense with other UO₃ molecules to form U₃O₈. Nobody has ever measured the gas products of uranium combustion. So far, only the solid combustion products have been measured. UO₃ residue has been detected from uranium munitions fires. [5]

Uranium absorption from UO₃ gas inhalation is immediate, while absorption from U₃O₈ particles is much slower, because U₃O₈ is partially soluble. [6] The particulate aerosols diffuse through the air at a different rate than UO₃ gas. Therefore, UO₃ gas exposure will not always occur simultaneously with particulate oxide exposure. Uranium ions absorbed by cells from the bloodstream soon become undetectable in the urine, as renal elimination occurs with a half-time of less than two weeks. [7]

Since UO₃ gas may be encountered without particulates, urine isotope ratio studies which depend on detecting uranium from slowly dissolving uranium oxide particles do not necessarily indicate uranium combustion product inhalation exposure, or the extent of uranium poisoning. The toxicological profile of uranium poisoning is dependent on elimination effects, such that a small dose occurring quickly (such as from UO₃ gas) will have a different physiological effect than from a larger dose occurring over a longer period of time (such as from U₃O₈ particle dissolution in the lungs.) All uranium poisoning is genotoxic and teratogenic, increasing the probability of chromosome aberrations in white blood cells and birth defects in children. [8] A 2001 survey of 15,000 U.S. Gulf War combat veterans and 15,000 control veterans found that the Gulf War veterans were 1.8 (fathers) to 2.8 (mothers) times as likely to report having children with birth defects. [9]

Therefore, empirical measurement of the amount of UO₃ gas produced by uranium combustion is necessary for determining the proper medical response to uranium combustion product exposure.

Furthermore, karyotyping measurements of chromosome aberrations will proportionally reflect uranium exposure, in addition to other genetic damage. Unless these questions are addressed, then people will continue to make the mistake of using urine testing to measure exposure instead of karyotyping. [10]

Finally, depleted uranium has just over the past year recently been confirmed as a neurotoxin in multiple peer-reviewed medical reports, leading to increased concern. [11-14]

As before, this is an exceptionally grave issue involving significant safety and environmental issues. Because of the substantial reproductive harm caused by uranium poisoning, it is clear on the face of the allegations that a result materially different from the issuance of the existing licenses would have been likely had uranium

trioxide vapor emission from uranium munitions been considered upon the initial applications for the licenses allowing them.

I ask for the following remedies:

- (a) I request that all uranium munitions licenses be explicitly modified to require a good-faith effort to quantify the dates, times, locations, quantities, and types of pyrophoric uranium munitions use, along with an estimation of the kinds of targets involved, and also provide any available information which might further specify the amounts, locations, times, and results of pyrophoric uranium munitions use.
- (b) I request that those licenses be explicitly modified to require the licensees to determine the amount of uranyl oxide gas produced in pyrophoric uranium munitions combustion in air under typical and observed use conditions.
- (c) I request that those licenses be explicitly modified to require the licensees to determine the extent of both reproductive and developmental toxicity from typical uranium combustion product inhalation in at least five diverse species of mammals (e.g., chimpanzee, pig, sheep, rabbit, mouse) using chromosome aberration analysis of lymphocytes and gonocytes in statistically significant numbers of exposed and control animals.
- (d) I request that those licenses be explicitly modified to require the licensees to publish their estimates and determinations from the license modifications specified in remedies (a), (b), and (c) above, and provide for the independent verification of all such studies' aspects, through the use of anonymous bidding of contracts for replication and auditing of data gathering and analysis, and also requiring that both initial and validating studies be published in the peer-reviewed medical or scientific literature.

I also ask for any further corrective action as deemed proper by the Commission, such as the financial penalties requested in my petition of 3 April 2005, as amended.

Because this request involves the conduct of military functions, in accordance with 10 CFR 2.301, I again ask that the Commission provide an alternative procedure for adjudication allowing the immediate issuance of orders to protect the health of United States armed forces currently at risk of exposure to uranium munition combustion products. This request for an alternative procedure includes but is not limited to: foreshortening of the Commission's customary time limits in accordance with 10 CFR 2.307(a), expedited issuance of an initial order in accordance with 10 CFR 2.339(a), and/or the use of expedited proceedings in accordance with 10 CFR sections 2.1400 through 2.1407.

I would be happy to answer questions concerning this petition. I may be reached by telephone at 650.793.0162 or by email to jsalsman@gmail.com. Please note my new postal mailing address:

James Salsman

353 Aldean Ave.
Mountain View, CA 94043

Please confirm receipt by return email. Thank you.

I certify under penalty of perjury that the forgoing is true and correct.

Sincerely,
James Salsman

P.S. This petition is located at:
<http://www.bovik.org/du/du-petition-2006.txt>

References:

- [1] Rostker, B. (2000) "Depleted Uranium in the Gulf (II)" Environmental Exposure Reports Tech. Rep. No. 2000179-2 (Washington, DC: Special Assistant for Gulf War Illnesses, Department of Defense)
- [2] Alexander, C.A. (2005) "Volatilization of urania under strongly oxidizing conditions" Journal of Nuclear Materials 346: 312-318. DOI:10.1016/j.jnucmat.2005.07.013.
<http://www.bovik.org/du/Alexander2005.pdf>
- [3] Alexander, C.A. (2006) personal communication:
<http://www.bovik.org/du/Alexander2006.txt>
- [4] Gilchrist R.L., J.A. Glissmyer, and J. Mishima (1979) "Characterization of Airborne Uranium from Test Firings of XM774 Ammunition," Technical report no. PNL-2944 Richland, WA: Battelle Pacific Northwest Laboratory
- [5] Salbu, B., K. Janssens, O.C. Linda, K. Proost, L. Gijssels, and P.R. Danesic (2004) "Oxidation states of uranium in depleted uranium particles from Kuwait" Journal of Environmental Radioactivity 78: 125-135. <http://www.bovik.org/du/Salbu-uranyl-detected.pdf>
- [6] Chazel, V. (1998) "Effect of U3O8 specific surface area on in vitro dissolution, biokinetics, and dose coefficients". Radiation Protection Dosimetry 79: 39-42. <http://www.bovik.org/du/Chazel98.pdf>
- [7] Ansozorlo, E. (1998) "Exposure implications for uranium aerosols formed at a new laser enrichment facility: application of the ICRP respiratory tract and systemic model" Radiation Protection Dosimetry 79: 23-27 <http://www.bovik.org/du/Ansozorlo98.pdf>
- [8] Hindin R., D. Brugge, and B. Panikkar (2005) "Teratogenicity of depleted uranium aerosols: A review from an epidemiological perspective," Environmental Health, 4:17
<http://www.ehjournal.net/content/4/1/17>
- [9] Kang H, et al. (2001) "Pregnancy Outcomes Among U.S. Gulf War Veterans: A Population-Based Survey of 30,000 Veterans," Annals of Epidemiology 11:504-511.
<http://www.annalsofepidemiology.org/article/PIIS1047279701002459/abstract>

[10] Schrder, H., A. Heimers, R. Frentzel-Beyme, A. Schott, and W. Hoffman (2003) "Chromosome Aberration Analysis in Peripheral Lymphocytes of Gulf War and Balkans War Veterans" *Radiation Protection Dosimetry* 103: 211-219. http://www.cerrie.org/committee_papers/INFO_9-H.pdf

[11] Briner, W. and J. Murray (2005) "Effects of short-term and long-term depleted uranium exposure on open-field behavior and brain lipid oxidation in rats," *Neurotoxicology and Teratology*, vol. 27, pp. 135-44. <http://www.bovik.org/du/du-on-rats.pdf>

[12] Monleau, M. et al. (2005) "Bioaccumulation and behavioural effects of depleted uranium in rats exposed to repeated inhalations," *Neuroscience Letters*, vol. 390, pp. 31-6.

[13] Lestaevel, P. et al. (2005) "The brain is a target organ after acute exposure to depleted uranium" *Toxicology*, 212, 219-226. <http://dx.doi.org/10.1016/j.tox.2005.05.002>

[14] Jiang, G.C. and M. Aschner (2006) "Neurotoxicity of depleted uranium: reasons for increased concern," *Biological Trace Element Research* 110:1-18. PMID 16679544.

P.P.S. Levinskii, Y.V. (1974) "p-versus-T Phase Diagram of the Uranium-Oxygen System" *Atomic Energy* 37(4):1075-6 is at:

<http://bovik.org/du/Levinskii74.pdf>

Please correct me if I'm wrong, but that looks pretty clearly like uranium trioxide reaches 1 atm of partial pressure at about 1400 degrees Celsius.

P.P.P.S. Here is further significant information with which I am re-submitting this petition, in accordance with Margaret Federline's offer of August 10, 2006:

Dr. Han Kang's bio:

<http://www.vethealth.cio.med.va.gov/Bios/hkk.htm>

After Dr. Kang examined children's medical records two years after his study cited above, the birth defect rate was found to have increased by more than 20%:

"Dr. Kang found that male Gulf War veterans reported having infants with likely birth defects at twice the rate of non-veterans. Furthermore, female Gulf War veterans were almost three times more likely to report children with birth defects than their non-Gulf counterparts. The numbers changed somewhat with medical records verification. However, Dr. Kang and his colleagues concluded that the risk of birth defects in children of deployed male veterans still was about 2.2 times that of non-deployed veterans." [Department of Veterans Affairs (2003) "Q's & A's -- New Information Regarding Birth Defects" *Gulf War Review* 12(1):10 <http://www1.va.gov/gulfwar/docs/GulfWarNov03.pdf>

Carter, R.F. and K. Stewart (1970) "On the oxide fume formed by the

combustion of plutonium and uranium" Inhaled Particles 2:819-38 (PMID 5527739) is at:

<http://www.bovik.org/du/CarterStewart.pdf>

--please see section (f) on page 836, which indicates that about half of burning uranium goes into a gaseous vapor fume, instead of the aerosol particulates which have thus far been the only portion measured.

Volatility of uranium trioxide (a/k/a uranyl oxide) gas:

http://www.bovik.org/du/vol_uo3g.png

--the plotted data points include those from Alexander (2005):

<http://www.bovik.org/du/Alexander2005.pdf>

and another Ackermann et al. (1956):

<http://dx.doi.org/10.1063/1.1743156>

and the DOF-adjusted R² corresponds to the 95% confidence interval shown.

Dr. Carl Alexander's recent web page:

http://www.battelle.org/solutions/fall04/ChangingTheWorld_Alexander.stm

Gibbs free energy of formations at 1 atm and 2500 K are:

UO₂(g): -1.1 MJ/mol

UO₃(g): -1.6 MJ/mol

I declare under penalty of perjury that the forgoing is true and correct.

Sincerely,
James Salsman

CC: "John Cordes" <JFC@nrc.gov>, "Joseph DeCicco" <JXD1@nrc.gov>, "Paul Goldberg" <PFG@nrc.gov>, "Margaret Federline" <MVF@nrc.gov>, "Vincent Holahan" <EVH@nrc.gov>, <tjlodge50@yahoo.com>, <DSNurse@aol.com>, <rosalieberstell@greynun.org>, <duweapons@hotmail.com>, <dlind49@aol.com>, "Charles L. Miller" <clm1@nrc.gov>, <alexandc@battelle.org>, <Han.Kang@va.gov>, "Jack Strosnider" <JRS2@nrc.gov>

Mail Envelope Properties (45726234.7DD : 5 : 55261)

Subject: Updated 10 CFR 2.202 petition
Creation Date 12/03/2006 12:35:16 AM
From: "James Salsman" <james@readsay.com>
Created By: james@readsay.com

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Size

13889

16293

Date & Time

12/03/2006 12:35:16 AM

Options

Expiration Date:

None

Priority:

Standard

ReplyRequested:

No

Return Notification:

None

Concealed Subject:

No

Security:

Standard