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From: Frank Cardile
To: Evangeline Ngbea
Date: 02/08/2007 3:59:41 PM
Subject: Comment letter from Mr. James Salsman

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

>>> "James Salsman" <jsalsman@gmail.com> 12/3/2006 12:50:31 AM >>>
Dear Mr. Reyes:

Here is additional significant new information which I did not include in my updated petition below, because it has to do with the uselessness of urine testing for uranium inhalation exposure after a period of a few weeks, for which I have requested no particular remedies. However, it is new and significant in that I have not brought it to the attention of the committee before, it is meaningful, and it shows that the licensees have not been protecting the health and safety of people in regulated areas. Therefore I ask that it also be considered in regard to both of my pending 10 CFR 2.202 petitions, and my pending rulemaking petition.

American soldiers are complaining of injuries that they attribute to depleted uranium. In early 2004, the UK Pensions Appeal Tribunal Service attributed birth defect claims from a February 1991 Gulf War combat veteran to depleted uranium poisoning.[1][2]

The US and UK governments have been attempting to monitor Gulf War veteran uranium exposure using urine tests.[3] Urine assay for uranium inhalation exposure can be useful, provided that measurements are made soon after a known acute intake. The urinary excretion rate falls substantially after exposure, particularly during the first few days. If urine analysis is carried out on a routine basis not related to the pattern of intake, then the errors in the assessment of intake can be considerable.[4] Exposure to teratogens may be measured by karyotype tests such as those most often provided for biopsy and amniocentesis. Soluble and most partially-soluble uranyl compounds affect gonadal chromosomes in proportion to the extent that they affect white blood cell chromosomes.[5] Uranyl poisoning causes immune system disorders and may cause cancer.[6]

References:

1. Williams, M. (February 9, 2004) "First Award for Depleted Uranium Poisoning Claim," The Herald Online, (Edinburgh: Herald Newspapers, Ltd.)
<http://vitw.org/archives/405>
2. Campaign Against Depleted Uranium (Spring, 2004) "MoD Forced to Pay Pension for DU Contamination," CADU News 17:
<http://www.cadu.org.uk/news/17.htm#icbuw>
3. Depleted Uranium Oversight Board (2006) "Summary of DUOB Activities," on www.duob.org.uk, accessed November 16, 2006:
<http://www.duob.org.uk/summary.htm>
4. Ansoborlo 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

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SECY-02

79: 23-27.

5. Schröder H, Heimers A, Frentzel-Beyme R, Schott A, Hoffman W (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

6. Wan, B., et al. (2006) "In vitro immune toxicity of depleted uranium: effects on murine macrophages, CD4+ T cells, and gene expression profiles," Environmental Health Perspectives, 114(1), pp. 85-91; PMID 16393663.

Sincerely,
James Salsman

On 12/2/06, James Salsman <james@readsay.com> wrote:

> 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]
- >
- > Uranyl 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. Uranyl 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 uranyl poisoning. The toxicological profile of uranyl 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 a period of time (such as from U₃O₈ particle dissolution in the lungs.) All uranyl 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 uranyl 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 uranyl 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)
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- > [2] Alexander, C.A. (2005) "Volatilization of uranium 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>
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- > [7] Ansoberlo, 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/Ansoborlo98.pdf>
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- > [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. Frenzel-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.
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- > 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

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