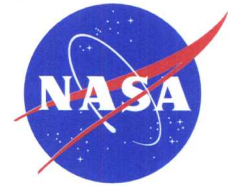


National Aeronautics and
Space Administration



Lyndon B. Johnson Space Center
2101 NASA Parkway
Houston, Texas 77058-3696

October 29, 2008

Reply to Attn of: AP121-FOIA-08-208

Mr. James Oberg
915 Avenue J
Dickinson, TX 77539

Dear Mr. Oberg:

This is in response to your Freedom of Information Act (FOIA) request, received August 28, 2008, for a copy of "all correspondence, email or hardcopy, between Mr. Nicholas Johnson and Dr. Jousef Butt, regarding the NASA-performed analysis of the USA-193 satellite threat."

The requested information is enclosed with the exception of third-party names. It is my initial determination that the third-party names are exempt from disclosure under Exemption (b)(6) of the FOIA [5 U.S.C. § 552 (b)(6)]. FOIA Exemption (b)(6) refers to "personnel and medical files and similar files the disclosure of which would constitute a clearly unwarranted invasion of personal privacy" 5 U.S.C. § 552(b)(6). See Department of State v. Washington Post Company, 456 U.S. 595, 599-603 (1982); New York Times v. NASA, 920 F.2d 1002 (D.C. Cir. 1990).

The names of the third-parties involved clearly satisfy the FOIA Exemption (b)(6) threshold requirement; that is, this information is highly personal in nature and directly concerns matters involving each individual's private life. In assessing the public interest in disclosure of such personal information, the Supreme Court, in *Dep't of Just. v. Reporters Committee for Freedom of the Press*, 489 U.S. 749, 773, sharply limited the concept of "public interest" under FOIA to the "core purpose" for which Congress enacted it: To "shed[]light on an agency's performance of its statutory duties." Disclosure of the aforementioned personal information does not appear to qualify under this narrow standard. However, even if some public interest could be found, after weighing both competing interests, it is clear in this instance that the harm to personal privacy of each individual outweighs any benefit of disclosure. See Department of Air Force v. Rose, 425 U.S. 352, 372.

You are advised that you may appeal to the NASA Administrator this initial determination to withhold the cited information. Your appeal must: (1) be addressed to the Administrator, NASA, Washington, DC 20546; (2) be clearly identified on the

envelope and in the letter as an "Appeal under the Freedom of Information Act;" (3) include a copy of the request for the Agency record, and a copy of the contested initial determination; (4) to the extent possible, state the reasons you believe the initial determination should be reversed; and (5) be sent to the Administrator within 30 calendar days of the receipt of this initial determination

A determination has been made that reproduction costs for this request were minimal. Accordingly, in keeping with NASA's policy to provide the widest practicable dissemination of information concerning its activities, reproduction costs have been waived.

Sincerely,

Stella Luna
JSC FOIA Public Liaison Officer

Enclosures

Subject: USA-193 FOIA Request 08-208

From: Johnson, Nicholas L. (JSC-KX)
Sent: Monday, August 11, 2008 8:39 AM
To: 'ybutt2002@yahoo.com'
Subject: RE: USA-193 -- Fw: FOIA request 08-191

Dr. Butt,

Various US Government agencies independently examined the likely extent of a hydrazine cloud emanating from the USA-193 titanium tank had it impacted on land after an intact, uncontrolled reentry. In February, US Government officials publicly stated that the extent of the cloud hazardous to human health might cover an area equivalent to two football fields. The actual extent, of course, would be dependent upon the terrain, wind, and temperature of the impact site, among other factors.

Due to the magnitude of this potential threat area, NASA developed a new risk assessment model employing a high fidelity, world-wide population distribution database. The NASA white paper authored by Dr. [REDACTED], which you possess, was prepared specifically to describe the methodology required to determine risks when very large casualty areas are involved. A significant aspect of the USA-193 threat, due to the large extent of the resultant hydrazine cloud, was that not only was the probability of casualty to one person high, but also the probability of incurring harm to more than one person was much higher than previous reentries. Dr. [REDACTED]'s technique also explicitly addresses that issue.

The issue of safety associated with the launch of a vehicle with a similar size hydrazine tank is very different, at least for U.S. space launches. If a launch vehicle malfunction were to occur early in flight, the remaining components of the launch vehicle and its payload would fall into designated broad ocean areas and pose very little threat of human casualty. If the launch vehicle malfunction were to occur later in flight, the vehicle would breakup on its reentry into the atmosphere from its ballistic trajectory. Since the hydrazine would be in a liquid, pressurized state, it would quickly be released and dissipated prior to impact.

Please note that many types of launch vehicles carry much greater amounts of propellants or other fluids which are capable of posing health hazards to humans. It is for this reason that launch azimuths are strictly constrained and that launch vehicles employ self-destruct mechanisms in the event that the vehicle deviates from its planned trajectory.

Regards,

Nicholas Johnson

From: yousaf butt [mailto:ybutt2002@yahoo.com]
Sent: Saturday, August 09, 2008 9:04 AM
To: Johnson, Nicholas L. (JSC-KX)
Subject: RE: USA-193 -- Fw: FOIA request 08-191

Dr. Johnson,

Thank you for pointing me to the Military Channel's "Satellite Shootdown" program. In it Gen Obering quotes a roughly $\sim 1/30$ chance of human casualty from the tank/hydrazine had the satellite been allowed to re-enter. The only way I can independently arrive at a remotely similar number is to assume a non-clustered distribution of people on the globe, and an very large lethality radius (tens of meters). Myself -- and several expert colleagues -- cannot support either of these assumptions, nor the final number quoted by Gen. Obering.

In any case -- just for the sake of argument -- if Gen. Obering's number were to be correct, this would raise another serious issue: since space launches are no better than $\sim 99\%$ effective in properly inserting their payloads to orbit, this would mean that satellites with any similar Ti hydrazine tanks ought not to be launched as the cumulative probability for a potential casualty from an unsuccessful launch or orbital insertion is $\sim (1/30) * (1/100) = 1/3000$, which is substantially higher than NASA and USG's $1/10,000$ adopted safe value.

Do you agree that there may be merit in imposing a moratorium on launching satellites with similar Ti hydrazine tanks as on USA-193, pending a better design (e.g. design-for-demise), or a more refined calculation of the risk numbers than those quoted by Gen. Obering?

Best regards,
Yousaf

--- On **Wed, 8/6/08, Johnson, Nicholas L. (JSC-KX)** <nicholas.l.johnson@nasa.gov> wrote:

From: Johnson, Nicholas L. (JSC-KX) <nicholas.l.johnson@nasa.gov>
Subject: RE: USA-193 -- Fw: FOIA request 08-191
To: ybutt2002@yahoo.com
Date: Wednesday, August 6, 2008, 2:27 PM

Dr. Butt,

At the direction of the USG, NASA is not permitted to discuss the final assessed human casualty risk from the potential hydrazine cloud. Dr. Matney's paper was written only to present the methodology for calculating risk posed by a large debris casualty area (as defined by NASA), i.e., in this case an extended hydrazine cloud. Former techniques, including those used by NASA, for relatively small, discrete satellite components were insufficient. I do note that Lt. Gen. Obering did mention a range of risk values in the recent "Satellite Shootdown" program on the Military Channel.

The human casualty risk from components of USA-193 (excluding hydrazine) was much less than the risk posed by the hydrazine.

The CGRO spacecraft was designed from the start for a controlled reentry at end of mission because of concern about risks to people and property on Earth from the unique elements of the vehicle. This was before the 1 in 10,000 criterion was set by NASA and later adopted by the US Government. Had CGRO been allowed to reenter in an uncontrolled fashion it would indeed have presented a human casualty risk substantially greater than 1 in 10,000.

I reiterate that more than one USG organization assessed that the titanium tank would have survived reentry. This work was originally done in 2007 and was the reason that Operation Burnt Frost was even considered. During Operation Burnt Frost these results were thoroughly revalidated.

Nicholas Johnson

From: yousaf butt [mailto:ybutt2002@yahoo.com]
Sent: Wednesday, August 06, 2008 11:43 AM
To: Johnson, Nicholas L. (JSC-KX)
Subject: RE: USA-193 -- Fw: FOIA request 08-191

Dr. Johnson,
thank you for the information.

Although you mention that no documents were kept of the final consensus numbers, could you simply inform me of those values? eg. the probability of one or more persons being hurt or killed by the tank/contents?

Dr. [REDACTED]'s paper appears to be incomplete in this respect, and our own calculations show that for a 5m lethality radius the risk of death of one or more people would be below 1/10000, taking into account clustering of the population.

e.g. Was a similar exercise done, as was with CGRO? In that case, the numbers released mentioned 1/1000 risk, and that was a far larger satellite. Personally, I felt even those numbers were a bit high also.

I understand that at times the risk is hard to quantify but were consensus bounding values obtained? Could you kindly share these with me? If not, would you be able to tell me the contact information of the relevant person at DoD that I may contact to ask about this?

