Cooperation between Civilian and Military Organizations during an Emergency: A Case Study Evaluation of the 2008 Reentry of an Uncontrolled U.S. Government Satellite Contaminated with Hydrazine

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Background and Introduction

Over a period of several weeks in February through March of 2008, a satellite operated and managed by the U.S. National Reconnaissance Office (NRO), became uncontrollable and began reentering Earth's atmosphere. Normally, space debris reentering the atmosphere does not survive, or it is very likely to fall into either the world's oceans or lightly populated regions of the Earth. In fact, no serious injuries or property damage has been confirmed as caused by debris reentering the Earth's atmosphere (NASA, 2008).

Under this emergency scenario however, specialists predicted that upon impact over 1,000 pounds of hydrazine[1] (used as a rocket fuel) could be released as a hazardous toxic gas, which could possibly endanger the public's health and welfare wherever the satellite finally fell (DoD, 2008a, b, c, d, e). In response to this potential crisis — even thought the likelihood of a significant adverse risk event was small — the Department of Defense (DoD), Office of the Assistant Secretary of Defense (Public Affairs) (OASD[PA]), developed a crisis and risk communication plan. The intent of the plan was to: engage multiple audiences (both domestic and international); inform the public with the appropriate information in order that they can respond to the risk; protect public health; demonstrate the U.S. Government's commitment to responsible space operations; and, establish that the U.S. Government is very capable to respond to this crisis (OASD, 2008; Ryder, 2008).

The intent of this paper is to examine the satellite crisis communication event as a case study learning tool. Specifically, this paper is intended to identify: key messages, audiences and stakeholders, key communication channels, underlying theory, other pertinent factors (the role of trust, the importance of experienced professionals, the significance of leadership support, etc.,),

[1] Hydrazines (CAS No. 000302-01-2) are clear, colorless liquids that are generally manufactured for use as rocket fuels and propellants. They are highly reactive substances that easily catch fire. Human exposure to hydrazine causes irritation to the eyes and respiratory system. Severe short-term exposures can causes seizures, pulmonary edema, damage to the liver, kidneys, and central nervous system, and in extreme exposures even death. It is also classified by the U.S. EPA as a probable human carcinogen (U.S. EPA Group B2 Carcinogen) (ATSDR, 2008; CDC, 2008; and, U.S. EPA, 2008).

and best practices in a manner that facilitates effective future emergency risk communication campaigns during biological threats and/or pandemics.

Approach and Methods

The approach and methods for conducting this case study included desktop research (i.e., literature review and internet research), as well as personal communication interviews with Department of Defense (DoD) subject matter experts. Literature review included primary references provided through the University of Pittsburgh, GSPH, Class BCHS 2572 (Risk Communication) (Quinn, 2008), and information compiled from the Internet.

Interviews included contacting current DoD government officials from the U.S Army Center for Health Promotion and Preventive Medicine (USACHPPM) and OASD(PA), as well as subject matter experts from other federal agencies such as the Department of Homeland Security (DHS). These subject matter experts were directly involved as contributing specialists in DoD's risk and crisis communication effort during the satellite reentry emergency. Interview questions developed for this case study are presented in Appendix A.

The focus of the desktop research and interviews was to identify government officials responsible for developing messages, determine the origin of final message content, identify success factors of messaging, and define message deficiencies (i.e., lessons learned) in a manner that describes what worked and what didn't under this emergency crisis event. The intent is to motivate improvements in crisis and risk communication messaging in future emergency risk communication campaigns.

Results: Basic Messaging Objectives, the Spokesperson(s), and Audience Profile

The space debris resulting from the reentry of the satellite had the potential to be dispersed over wide-spread areas, as well as over a wide time span possibly impacting multiple stakeholders. As such, communication objectives, key messages, audiences, and stakeholders identified were far-reaching and broad. Once the impending crisis was declassified, the Office of the Secretary of Defense (OSD) created a plan to assure an "active posture" in communicating the unfolding events of the satellite's reentry, and those risks posed by potential public exposures to hydrazine fuel.

The OASD[PA] Office was the lead agency for coordinating all emergency communication during the different phases of the crisis ranging from the initial public release when the unfolding event became unclassified, until the ultimate in-space destruction of the satellite occurred by the DoD (i.e., the U.S. Navy). Communication plans included having OASD(PA) transition communication lead to the Department of Homeland Security (DHS) should the debris and contamination land within the boundaries of the U.S., while retaining the U.S. Department of State as the lead for all diplomacy activities with foreign nations adversely impacted by the debris should the satellite fall outside of the borders of the U.S. (OASD, 2008).

Specific objectives were outlined by the DoD in the OASD Satellite Engagement Communications Plan (2008). They included:

- Reinforce that the U.S. Government is concerned about public safety, and that the government is committed to safe space operations.

- Maintain communications with allies of the U.S. and all foreign governments in a timely and technically accurate manner.
- Build confidence that the U.S. is well equipped and well-postured to respond globally.
- Be responsive, accurate, and truthful about the event as expediently as possible through the answering of all questions from the public and the media about the DoD's efforts to respond to the reentry of the satellite.

Multiple themes and messages were created to respond to the event (OASD, 2008). Primarily, messages fell under the main categories of: (1) Engagement (the U.S. selected to destroy the satellite at a low altitude to reduce the risk of debris researching the earth); (2) Reentry (in the event that debris and hydrazine causes damage, the U.S. will be responsible); and, (3) Space Operations (all governments are responsible for their space operations, and that those operations are increasingly technically complex with not all activities equally successful). Each message developed under these broad categories focused on being open and honest with the public, explaining the facts associated with the reentry of the satellite, and taking full responsibility while solidly assuring preparedness for full response by the DoD.

According to materials published by the OASD(PA), and personal discussions with the Public Affairs Officer responsible for providing support to the communications effort (OASD, 2008; Ryder, 2008), a number of audiences were identified by the DoD as critical to the success of the ongoing emergency communication plan. They included: interagency leadership (e.g., Department of State, Department of Homeland Security, etc.); Foreign Governments (e.g., potential impact sites and vulnerable populations); Congress (i.e., the Senate and House of Representatives); NASA; and, the Media (i.e., U.S. and international public). All audience stakeholders identified had specific targets for messaging, as well as specific messaging tactics that included developing and delivering written products, briefings and releases (e.g., press and congressional), and reentry prediction releases (OASD, 2008; Ryder, 2008; DoD, 2008a, b, c, d, e). Other federal agencies chartered for the protection of public health and environment also conducted related information releases concerning the hazards associated with hydrazine fuel exposures such as through the Center for Disease Control's (CDC's) Health Alert Network (ATSDR, 2008; CDC, 2008; and, U.S. EPA, 2008). All communications were geared toward meeting the goals and objectives of the OASD(PA) emergency risk and crisis communication plan.

Discussion: Attributes for Success & Areas of Development

Research conducted for this case study suggests that the risk and crisis communication plan worked well for the DoD. According to Heath (2008), this particular crisis communication event was a "big success" and a good example of DoD working with other Federal Agencies for a level of focused coordination that was "historical". A number of factors and attributes led to its success. Those included, but are not limited to, the following:

- Applying risk and crisis communication theory such as a modified communication persuasion matrix as described by Glik (2007) (i.e., OASD[PA] created a through risk communication plan outlining an overarching strategic and tactical planning matrix for crisis communications that included message sources, audiences, and expected outcomes);

- Holding true to key crisis communication success factors as outlined by Reynolds and Seeger (2005) (i.e., OASD[PA] created and delivered messages regarding the current state of the conditions during the reentry event that were principally informative, situation centered, and delivered by appropriate authority figures and technical experts); and,
- Anticipating the public's level of risk perception as described by Slovic (1987) (i.e., OASD[PA] created an extensive anticipatory set of questions and answers to respond to the perceived risks related to the unknown and factors of dread associated with the satellite's reentry to Earth and subsequent public exposures to hydrazine).

Along with the basic principles of risk and crisis communication theory evident through the development and execution of the OASD[PA] plan, there were a number of factors and principles that were clearly distinguishable in the execution of the crisis plan that should be noted. Those basis principles as identified in personal communications with OASD[PA]'s contributing officer, Lt. Col., Ryder (2008) and DHS's Public Affairs Officer Mr. Heath, included the following:

- "*Truth is the best strategy*." According to Lt. Col., Ryder, truthful and routine messages explaining what is known and what is not known was the single most important factor for OASD[PA]'s success in this crisis communication event.
- Clearly and immediately sharing "*facts and projected happenings*" about this complex event was also important in assuring that the receivers of the messages understood what was happening, and that they remained aware in a manner that would ultimately lead toward overall public health protection.
- Executing the plan with "*very experienced professionals*" and "*collaborative cross-talk*" with key agencies at the table was crucial in maintaining effective crisis communication with all stakeholders.
- "*Contingency planning is a must*." Risk mitigation and worst-case scenario planning assured that all potential consequences considered and anticipated as part of the preparation activities.
- "*Sr. Leadership Support was invaluable*." Having Sr. Leadership support from the OASD Public Affairs Office up to, and including, the President of the United States assured that all resources necessary for creating and delivering crisis communication messages were available, and that all authority figures and technical experts were consistent during the crisis communication event.
- "*Use of the DHS National Incident Communications Conference Line (or NICCL calls) as a primary communication line helped channel the communication among several strategic stakeholder agencies including the DoD, FEMA, HHS, and the FFA*." The NICCL calls, combined with multiple agencies working together under one strategic plan was a principal factor in this event becoming one of the best examples of focused coordination during a crisis.

Overall, information dissemination from the OASD[PA] during this crisis event appeared more than adequate, clear, consistent, and credible. And although there were key lessons for success in this case study (i.e., rapid factual communication with the public, stakeholder collaboration, flattened communication channels where less executive oversight was required, etc.,), there were some features of the event that challenged the DoD and remained factors of "*fog and friction*"

that required "*heavy lifting*" by the individuals creating the messages (Ryder, 2008). Those factors identified by Ryder (2008) and Heath (2008) included:

- A short and compressing time-line;
- A technically complex event with significant uncertainty;
- An administratively complex event (i.e., dealing with classified information across multiple agencies and time zones);
- Resource limitations (albeit initially); and,
- Mixed Messages.[2]

According to Ryder (2008), this was "not a monolithic event", but very dynamic undertaking that was comprised of multiple agencies, seams, and points of potential failure. It possessed multiple levels of complexity requiring relentless planning up to the delivery of final briefings originating from the DoD's OASD[PA].

This short case study provides a clear example of the importance of relying on basic principles of risk and crisis communication and emergency communication planning during crisis communication events. One important element is developing appropriate strategic and tactical plans, as well as coordinated guidance and communication as events unfold. The concepts of being truthful and rapid in information dissemination during an emergency are invaluable. Additionally, health professionals must remember that there will be challenges that threaten successful crisis communication activities that are very common (e.g., short time frame, complex unfolding events, limited resources, multiple stakeholders, etc.,). Those challenges, however, can be overcome with focused communication and planning, and can become easier as events evolve (Ryder, 2008; Heath, 2008). Overcoming those challenges will require clear and purposeful upfront planning and coordination among all involved for a successful emergency risk and crisis communication effort during any biological threat or pandemic.

[2] According to Ryder, preceding almost immediately to this crisis event the U.S. Government officially disapproved of the People's Republic of China taking action to engage and destroy one of their space satellites; However, their satellite was not uncontrollable, and was not posing danger to public health. The anti-satellite technology used was potentially tested to destroy satellites over 300 miles in space, and not descending into the Earth's atmosphere.

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References

ATSDR, 2008. "What are Hydrazines?" ATSDR Substance Profile for Hydrazine. Accessed online at: http://www.atsdr.cdc.gov/substances/hydrazines/

CDC, 2008. "Potential Health Effects Associated with Hydrazine and Satellite Reentry." Official CDC Health Advisory. February 20, 2008. Distributed via Health Alert Network. Accessed online at: http://www.bt.cdc.gov/agent/hydrazine/HAN_02_2008.asp. Visited October 13, 2008.

DoD, 2008a. "DoD To Engage Decaying Satellite." DoD Press Release, No. 0125-08. February, 14. Accessed online at: http://www.defenselink.mil/releases/release.aspx?releaseid=11691. Visited October 13, 2008.

DoD, 2008b. "Satellite Debris Analysis Indicates Hydrazine Tank Hit." DoD Press Release, No. 0146-08. February 25. Accessed online at: http://www.defenselink.mil/releases/release.aspx?releaseid=11704. Visited October 13, 2008.

DoD, 2008c. "Defense Department Background Briefing on the Satellite Intercept Attempt by Sr. Military Official." News Transcript. Presenter: Unnamed Sr. Military Official. February 20, 2008. Accessed online at: http://www.defenselink.mil/transcripts/transcript.aspx?transcriptid=4151. Visited October 14, 2008.

DoD, 2008d. "Media Availability with Secretary Gates at the Pier for the USS Russell, Pearl Harbor, Hawaii." News Transcript. Presenter Secretary of Defense Robert M. Gates. February 21, 2008. Accessed online at: http://www.defenselink.mil/transcripts/transcript.aspx?transcriptid=4155. Visited October 14, 2008.

DoD, 2008e. "DoD News Briefing with Deputy National Security Advisor Jeffery, Gen. Cartwright and NASA Administrator Griffin." News Transcript. Presenter: Deputy National Security Advisor James Jeffrey, Vice Chairman, joint Chiefs of Staff Gen. James Cartwright and NASA Administrator Michael Griffin. February 14, 2008. Accessed online at: http://www.defenselink.mil/transcripts/transcript.aspx?transcriptid=4145. Visited October 14, 2008.

Glik, D., 2007. Risk Communication for Public Health Emergencies. *Annual Review of Public Health*, 28, 33-54.

Heath, S., 2008. Personal communications between Mr. C. Tomljanovic, University of Pittsburgh, GSPH, and Mr. Stan Heath, DHS Public Affairs. (DHS Public Affairs and

Communications Coordinator for the Hydrazine Crisis.) Phone No. 202-282-8117. Telephone Interview Conducted October 20th, 2008.

NASA, 2008. "Orbital Debris Frequently Asked Questions." *NASA's Orbital Debris Program Office*. Accessed online at: http://orbitaldebris.jsc.nasa.gov/faqs.html#13. Visited October 16th, 2008.

OASD, 2008. "OASD Satellite Engagement Communications Plan, 14 Feb 08". Office of the Assistant Secretary of Defense for Public Affairs. OASD(PA) Official Website: http://www.governmentattic.org/docs/(U)_OASD_Satellite_Engagement_Communications_Plan_(1400_hrs_14_Feb_08).pdf. Visited October 15th, 2008.

Quinn, S., 2008. BCHS 2572: Risk Communication. Graduate School of Public Health. Fall 2008. University of Pittsburgh, Graduate School of Public Health. Pittsburgh, PA.

Reynolds, B. and M.W. Seeger, 2005. Crisis and Emergency Risk Communication as an Integrative Model. *Journal of Health Communication*, 10, 43-55.

Ryder, P., 2008. Personal communications between Mr. C. Tomljanovic, University of Pittsburgh, GSPH, and Lt. Col. Patrick Ryder, USAF, OASD Public Affairs Office. (Public Affairs Officer for the Hydrazine Crisis.) Phone No. 703-697-8317. Telephone Interview Conducted October 16th, 2008.

Slovic, P., 1987. Perception of Risk. *Science*, 236, 280-286.

U.S. EPA, 2008. "Hydrazine." Hazard Summary Created in April 1992; Revised in January 2000. Accessed online at: http://www.epa.gov/ttn/atw/hlthef/hydrazin.html. Visited October 15th, 2008.

White, M., 2008, Personal communications between Mr. C. Tomljanovic, University of Pittsburgh, GSPH, and Mr. Mike White, U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), Risk Communication Program Officer. Phone No. 410-436-7715. Telephone Interview Conducted October 17th, 2008.

Appendix A: Interviews

Interviews

All Interviews were conducted by the author. Interviews were conducted by telephone, or via email. Handwritten notes (or electronic notes) were taken as appropriate. Interview respondents are quoted in the text if suitable. All respondents provided informed consent to participate. Questions are provided below. People contacted are also listed. People contacted were identified through the open Internet. Interviewees were believed to be associated with developing risk communication messages based on organizational title and DoD affiliation. For the purposes of this short case study, Interviewees were limited to organizations within the DoD. Secondary and/or tertiary contacts may have been identified from primary contacts and are noted as such. Respondents that have not yet replied to data requests are noted as such.

Interview Introduction and Questions

Q1. *Hello, my name is Chuck Tomljanovic; I am a Sr. graduate student from the University of Pittsburgh, Graduate School of Public Health in Pittsburgh, PA. I am conducting a case-study evaluating of the risk communication messaging developed during a DoD crisis event. May I ask you a few questions regarding risk communication activities during a recent event in 2008?*

Q2. *Did you have a role in formulating risk communication messages during the 2008 reentry of the uncontrolled U.S. government satellite and potential exposures to satellite debris contaminated with hydrazine? If so what was your role? If not, do you have a contact that did? To the extent of you knowledge, what was their role?*

Q3. *What was a key element or number one attributes that helped in the development or shaping of your messages? What were you trying to do or say? Who were you trying to reach (i.e., who was the vulnerable population)?*

Q4. *Do you feel that you succeeded and why/why not?*

Q5. Did your message(s) draw upon an underlying theory or best practices? What did you rely on and why/why not?

Q5. *From your perspective, what played a critical role in its success? What played a critical role in you or your team missing overall objectives or goals?*

People/Organizations Contacted

Lt. Col, Patrick Ryder, USAF, OASD Public Affairs (Primary Reference)

Mr. Mike White, Acting Program Manager, Health and Communication, U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) (Secondary Reference) (Contacted: Reply Outstanding)

Mr. Bruce Sprecher, U.S. Strategic Command Public Affairs (Secondary Reference) (Contacted: Reply Outstanding)

Mr. Stan Heath, DHS Public Affairs (Secondary Reference)

Mr. Richard Buenneke, DOS Space Policy (Secondary Reference) (Contacted: Reply Outstanding)