



CENTER FOR INTERNATIONAL SECURITY AND COOPERATION

## **Thoughts on the Day After**

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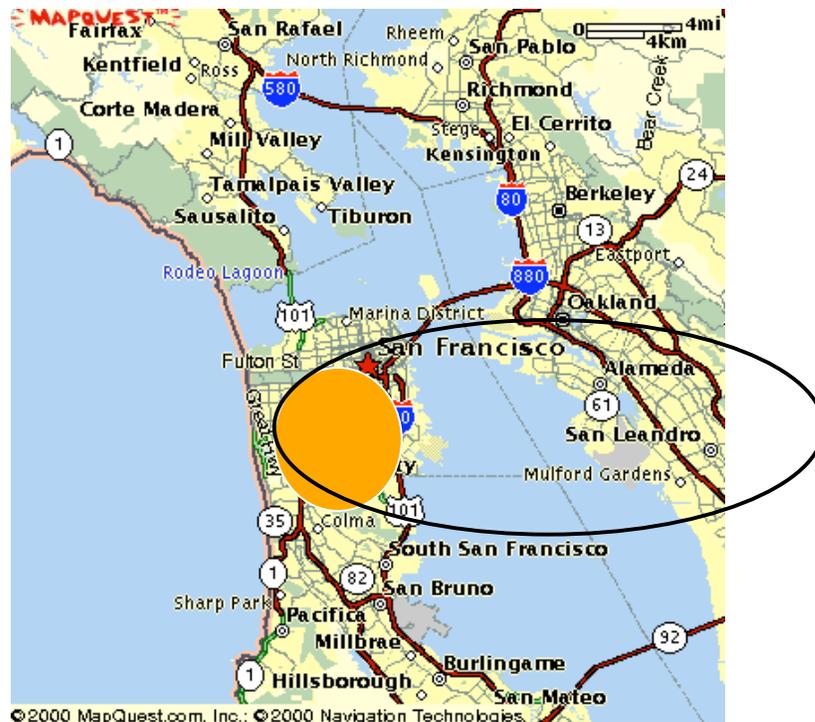
## Thoughts on the Day After

Michael M. May

This note consists of some observations on the “Day After,” or perhaps “Minutes to Months After” that I thought might be useful. They are derived from work done in the past few years, in part for DHS and its predecessor agencies. That work included observing and providing comments on the Topoff 2 Federal-State-Local coordination exercise of 2002-2003. These notes also derive from a workshop we did in 2002 that brought together first responders, media and scientists to discuss the aftermath of a nuclear explosion in the SF Bay Area. I make no attempt at being comprehensive but note a few things that, in our experience, have not seemed obvious to all participants. The notes are divided into two parts, “Response and Recovery” and “Political Reactions.”

### Response and Recovery

1. After a nuclear explosion in a large city, most people will survive.



As the very approximate picture above shows<sup>1</sup>, blast and fire from a 10-kiloton ground burst in downtown San Francisco would destroy most of the city itself. More than half of the area shown in orange would be destroyed by fire. Most of the people in that area would be killed or badly hurt. Fallout levels requiring evacuation, using typical wind speed, would extend across the bay over Oakland, approximately as the black oval shows. Of the six million people living in the Bay Area, hundreds of thousands could be dead, perhaps twice as many could be hurt in some way and perhaps a million would have to evacuate. The remaining four or so million would be unhurt and away from fallout. At least as important as the question of limiting damage, caring for those hurt and evacuating and resettling evacuees is the question of how to assure insofar as possible that the remaining and larger population helps rather than hinders the response and recovery efforts.

2. **Studies of previous disasters (including wartime disasters fully as bad as the one postulated here) show that the great majority of people will not panic and will follow credible leadership if appropriately informed.**<sup>2</sup> The first problem therefore is to provide credible leadership and information. That has proven difficult in first-of-a kind disasters. The leaders to whom people will turn should survive, themselves be well informed (more on this below) and speak with one voice. They should also communicate in all the ways that people will look for – radio, TV, web sites, podcasts, etc. – directly and through the media. The surviving media (there will be plenty), formal and informal such as web sites, will talk continuously and put whomever they can get a hold of on the air or the Internet. Misinformation cannot be helped but there must be a continuous informed source of information from the responsible authorities. Furthermore, these authorities and the people advising them will make mistakes. Those should be promptly acknowledged, which goes against the grain of government authorities. Local exercises against a possible nuclear explosion involving all relevant levels of authority, as well as the sources of information that they will need, are essential. I don't know if they have been carried out. The tendency has been to exercise against lesser threats such as a dirty bomb or a biological attack. The latter could turn out more lethal but also usually leaves more time for action.
3. **Presidents, governors, mayors et al. are not technically trained and there is virtually no opportunity to train them ahead of time.** For that reason, at least one person on their immediately available staff must have enough technical training to understand and make use of field inputs such as radioactivity levels, plume direction (they, and preferably also the public and media, should have

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<sup>1</sup> The sketch is based on doubling the 5 cal/cm<sup>2</sup> area from a 10-kiloton groundburst to about 15 square miles and assuming about 50 square miles of dangerous fallout. Both numbers are highly uncertain.

<sup>2</sup> E.L. Quarantelli, "Sociology of Panic," in P. B. Baltes and N. Smelser, eds., *International Encyclopedia of the Social and Behavioral Sciences* (Pergamon Press, 2001); Lee Clarke, "Panic: Myth or Reality?" *Contexts*, Vol. 1, No. 3 (Fall 2002); Kathleen Tierney, "Disaster Beliefs and Institutional Interests: Recycling Disaster Myths in the Aftermath of 9/11," in Lee Clarke ed., *Terrorism and Disaster: New Threats, New Ideas, Research in Social Problems and Public Policy* (Elsevier Science, 2003. References from Charles Perrow.

access to real-time dynamic plume prediction) and other issues specialized to nuclear explosions. The immediately available staff at whatever command center has survived the explosion<sup>3</sup> would also normally include people with access to police and fire departments, reports from hospitals, and status reports on the various essential networks but, without exercises, they will not be prepared for the magnitude of the destruction. Some of the essential networks will survive and much can be done if their status can be ascertained.

- 4. Prior to the explosion, the essential networks (electricity, telecommunication, water, gas, etc.) should be surveyed from the point of view of how to restore functionality, however partial.** At least as of last year, when we looked at the (now defunct) DHS Preparedness Directorate, much of the attention centered on identifying key highly connected nodes. Real networks are not scale-free and restoring functionality is different from identifying such nodes. Key nodes can be bypassed in some cases if the network is surveyed and understood. Only realistic (and unfortunately expensive) exercises can help surface that information. Again as of last year, it was a struggle to get money to run realistic local exercises.
- 5. Contaminated waste will choke essential assets like hospitals and will cause added casualties and loss of confidence if there is no provision for safe temporary storage prior to eventual disposal.** This is politically difficult to do ahead of time. It is an area for coordinated local and regional study and action.
- 6. Contaminated land and buildings may be so dangerous as to mandate evacuation, but over a much larger area evacuation will not be needed.** Wholesale evacuation beyond what is needed should be avoided to the maximum extent possible. It is time consuming, costly, it harms people beyond what has already been suffered, and it interferes with response and recovery. In Topoff 2, the standards for evacuating people and considering material to be contaminated were the usual EPA standards, designed for peacetime civilian activities. Temporary standards that take into account the very real risks of evacuation to people and property (not to say morale) should be established instead ahead of time.
- 7. Limiting evacuation will be difficult.** It should be exercised ahead of time but no amount of exercises can substitute for some measure of technical awareness on the part of local leaders and media. If even a fraction of the public can be educated to relative dangers and what can be expected, it could make a major difference in alleviating the consequences of a nuclear attack.<sup>4</sup> DHS has an outreach program but may not have focused on dealing with the aftermath of a nuclear explosion.

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<sup>3</sup> Designating a chain of succession at the local level is needed. It has been done in some states at least.

<sup>4</sup> Following our 2002 workshop, we disseminated Q and A's covering basic nuclear information to about 200 media, at the suggestion of some of them. Much more could usefully be done.

## Political Reactions

1. **Attributing the explosion to its source will be politically urgent but in all likelihood will take some time.**

<u>Characteristic</u>	<u>Time Scale</u>	<u>Comments</u>
Detonation is nuclear	Less than an hour	Determined from yield (seismic magnitude), optical signature and presence of excess radiation above normal background (due to neutron activation and the presence of fallout). Rapid classification as unambiguously nuclear can be more challenging for low yields (e.g., sub-kiloton)
Nature of fuel (HEU, Pu), evaluation of performance, and initial assessment of isotopic signatures	Hours to weeks	Limited by time needed to collect sample, bring to laboratory, prepare for analysis and interpretation.
Complete characterization of chemical and physical signature	1 to 2 weeks	Limited by decay counting and by need for multiple high-resolution analyses
Attribution and assessment of further threat	Hours to years	Limited by availability of relevant databank

I reproduce above a timetable that Raymond Jeanloz, Jay Davis and I came up with.<sup>5</sup> Ruling out possible sources about which much is known will come sooner than positive attribution and may help withstand political pressure to some degree.

2. **An internationally credible data bank, as complete as possible, is needed to extend the reach of the attribution process.** Not every state will cooperate and not every state will be honest. Also, not all the information that should be contributed will be unclassified. On balance, however, improvements in what is now available will make a significance difference in the technical part of the attribution process in our judgment.
3. **The technical side of attribution is only a part of the overall process.** That's pretty obvious and I understand DTRA has teams from the relevant Federal agencies exercising together against this kind of event.
4. **The main consequences of terrorism to date have been political, as indeed the consequences of terrorism are meant to be.** An act of nuclear terrorism, despite the large human, psychological and economic costs, would be no different. Cities have been lost before, including to nuclear weapons, and, after the tragedy, what affected people most lastingly was the political outcome, both domestic and

<sup>5</sup> Michael May, Raymond Jeanloz and Jay C. Davis, "Preparing for the Worst" *Nature* Vol. 443 10 October 2006 Commentary. Also <<http://www.nature.com/nature/journal/v443/n7114/full/443907a.html>>; or through CISAC's website at <[http://cisac.stanford.edu/publications/preparing\\_for\\_the\\_worst/](http://cisac.stanford.edu/publications/preparing_for_the_worst/)>

foreign. We can expect the normal reactions, “Never again” and “Whose fault was this?” to dominate policy, as they did after 9/11. What policy steps can be identified ahead of time that will deal with the political and strategic needs of that situation with due regard to the long-term physical and political health of our and other people? It is at least as important to prepare for the political consequences of a nuclear attack for foreign policy and domestic polity as to prepare for physical response and recovery.

5. **On the foreign policy side, 9/11 should teach us that what is traumatic to us does not necessarily get to the top of the agenda elsewhere.** It will again be counterproductive to try to force it to the top of other states’ agenda without taking into consideration what is at the top of their agenda. While every government, especially those of other potential target countries, will pay attention to a nuclear explosion and to what the US does about it, existing interests and alignments will not vanish because the US has lost a city. The US will need international cooperation to carry out the political mandates generated by the attack. What policy instruments will be needed to carry out the US priorities given competing priorities elsewhere?
  
6. **On the domestic side, the most important need will be to maintain democratic institutions and a balance of power.** The character and ability of the President at the time and his or her standing with the electorate and the Congress will be determinative. Not much can be done about that, but some precautions can be taken. Here are my suggestions, offered with due awareness of my limitations.
  - a. Congress can legislate a better system of specialized terrorist courts and judicial rules. Other democracies have done so. Right now, we have a divisive mess. This could be the subject of a Congressionally sponsored study, perhaps carried out by retired justices and other acknowledged experts, and taking advantage of the experiences and mistakes made abroad as well as our own.
  - b. A law could make provision for an emergency coordinating group that would comprise some key members from both executive and legislative branches. This group would not take away from the powers of either branch nor interfere with needed urgent action by the President, but would assure that what needs legislation is done according to the Constitution.
  - c. The underlying situation would continue to be that of a handful of terrorists acting against everyone else, a danger but not the kind of large-scale civil disturbance or rebellion that would call for revoking the freedoms of citizens. Indeed, the citizenry is likely to be the source of effective improvised measures to alleviate the damage if it is informed and free to act. Contrary to some accepted wisdom, effective action does not necessarily require broadened executive power. It does require improved coordination among and between the agencies of our complex federal system.