Who Will Stop Nuclear Next Use?

The Nautilus Institute Scenarios Workshop 2004 Final Report
April 27-28, 2004
Berkeley, California

August 6th, 2045: The United Nations commemorates the one-hundredth anniversary of the atomic bombings at Hiroshima and Nagasaki. At each city, along with the traditional memorial to the dead, city mayors award organizations and individuals who have ensured that nuclear weapons remain unused. In the century since these Japanese cities were obliterated, no nuclear explosion has been directed against human targets.

No use of nuclear weapons against human targets in the next forty years? Is such a future possible? In April 2004, the Nautilus Institute for Security and Sustainability assembled a team of scholars, activists, government officials, and critical and creative thinkers from around the world to grapple with this question. Using a method called *scenario planning*, the Nautilus group explored how one or more nuclear weapons could be used against human targets in the next decade, what could be done to avoid such attacks, and who must do what to ensure that nuclear next-use does not happen.

The Nautilus Institute is an internationally networked organization that for over twenty years has focused on issues of security, nuclear proliferation, energy and the environment. This workshop is the latest in a series of scenarios workshops focusing on global problems, the reports of which are available on the Internet.[1]

A complete list of 2004 participants is included in Appendix #1.

Nuclear Next-Use

The focal question for the workshop — "who will stop nuclear next-use?" — hinges on the unusual, but evocative, phrase: "nuclear next-use."[2] This was defined as the *targeted detonation of a nuclear weapon against any human being.* This notion includes the inadvertent use of a targeted weapon, but does not include unintended deaths or injuries from exposure to nuclear tests, nor the (intentional or otherwise) use of radiological dispersal devices (sometimes called "dirty bombs") that do not sustain nuclear fission. The purpose of using a narrowly drawn definition is to bring the issue into stark clarity: the world faces the prospect that one — or more — nuclear weapons may be detonated on human targets in the coming years.

In many ways, the situation we face is even more dangerous than in the depths of the Cold War. During the fifty year struggle between the United States and the Soviet Union, the situation was simple: both sides knew the other possessed awesomely powerful weapons, and believed the other would use these weapons if attacked. MAD — or Mutually Assured Destruction as it was known in the United States— was a straightforward, if harrowing, interaction.

Today, the nuclear game is more complicated and unpredictable. Complex and interrelated global problems are intertwined with the closed world of nuclear weapons and decision-making in ways that are poorly understood and may drive outcomes more than

[1] Scenarios http://www.nautilus.org/gps/tools.html
[2] See *Global Insecurity and Nuclear Next-Use, Briefing Paper*, November 5, 2003, at: http://nautilus.org/gps/scenarios/GP-WMDTrends.PDF

conventional nuclear behaviors from the past. The possibility of non-state actors gaining access to nuclear weapons makes the straightforward logic of MAD untenable; against whom can a state massively retaliate if the perpetrators bear no national allegiance or affiliation?

The Doomsday Clock

The differences between the Cold War era and the present were clear to the Global Scenarios 2004 workshop participants. Most felt that some nuclear attack (involving at least radiological weapons) is a near certainty over the next two decades, but that a full-scale exchange is avoidable. Few thought that an exchange involving non-superpower nuclear nations — such as India and Pakistan — was any more likely than an exchange involving the United States. The collective fear focused on the possibility of non-state actor use of one or more weapons against civilian targets and escalation to inter-state nuclear attacks, as well as the question of what would happen next. Would there be a "micro nuclear arms race" between various non-state groups? How much longer would we have to wait for the *next* nuclear next-use?

The possibility of a nuclear weapon terror attack is one taken very seriously by those who would face it most directly. First responders in many cities — the firefighters, paramedics, police officers, and the like —already assume that a nuclear blast *will* happen in the city in the near future. Most participants believe that the "doomsday clock" is ticking ever closer to midnight.

The Workshop

The Global Scenarios 2004 workshop revealed a growing belief that nuclear next-use is highly likely in the coming years, whether as an exchange between states or launched by a non-state actor (possibly using materials gained from a state on the sly). The goal of the workshop was twofold: to uncover the policies and approaches that could deflect this potential nuclear next-use to a less devastating outcome and to answer the question of *who* would have the *ability and motivation* to fulfill this responsibility.

To achieve these goals, the workshop used *scenario planning*, a structured group process for creating multiple, divergent narratives of the future, based on a collective understanding of the forces underlying how the future might unfold, and aimed at answering the meeting's focal question (in this case, "Who will stop nuclear next-use?"). The Global Scenarios 2004 workshop used the four different scenario worlds on the first day to explore how nuclear next-use might occur or be avoided. On the second day, the workshop explored what tipping points and moments of leverage might shift the futures wherein nuclear next-use might occur towards futures where such a tragedy was preventable.

Nautilus picked the year 2015 as the target date for the scenarios. Each of the futures constructed by the Global Scenarios 2004 workshop participants would describe the state of the world a little more than a decade from now. This length of time allows for some of the slower global processes to show signs of change (for example, environmental and demographic shifts), while still being near enough that some of the more spectacular (but plausible) possibilities for this century (for example, material nanotechnology or the emergence of a hydrogen power economy) would still remain on the horizon. The ~10 year time frame is also useful for framing political issues: although the world will still face many challenges that are salient today, players and positions will change over a decade.

The Critical Issues

Workshop participants began by exploring the forces and events that could shape the next ten years. Some of the issues were closely connected to nuclear weapon development and proliferation, such as stockpile control problems and the question of Iran's nuclear development; but most were concerned with the global context for conflict, such as climate change and the growth of "open source" as an economic model. Participants found these contextual issues to be important; the possibility of nuclear next-use, and the range of tools and approaches the global community would need to prevent it, depends on how such issues evolve over the next decade. The outcomes and dynamics in the arenas of social development, technological advances, the global economy, environmental challenges, political shifts, and more all will affect whether and how nuclear weapons may be used again against human targets.

The full list of critical issues and driving forces generated by participants can be found in the Appendix. In the end, via voting and grouping, participants chose critical driving forces that were judged the most important:

- Global environmental changes and resource crises
- Collapse of established international order and institutions
- Spread of information "transparency" and open source/open access knowledge.
- A change in the status of "middle power" nations (for example, Iran, Korea, India).
- A change in the nature of the "great power" nations (China, the European Union, Russia, the United States).

The scenario teams were asked to give particular consideration to these issues as they constructed their scenarios, and later, when they worked on possible solutions.

The Scenarios

Because the Global Scenarios 2004 workshop participants would be asked both to create scenarios and then to re-examine them, Nautilus jump-started the scenario work by seeding the efforts with a pre-existing scenario matrix. This matrix consisted of two "axes of uncertainty" — the skeletal framework for how each scenario would look — chosen to give each team a chance to work on a substantially different world, while still driving towards the same larger goal.

The two scenario axes were *Next-Use Avoided* vs. *Nuclear Next-Use* and *Actors Tend to Abide by International Institutions* vs. *Actors Tend to Ignore International Institutions*

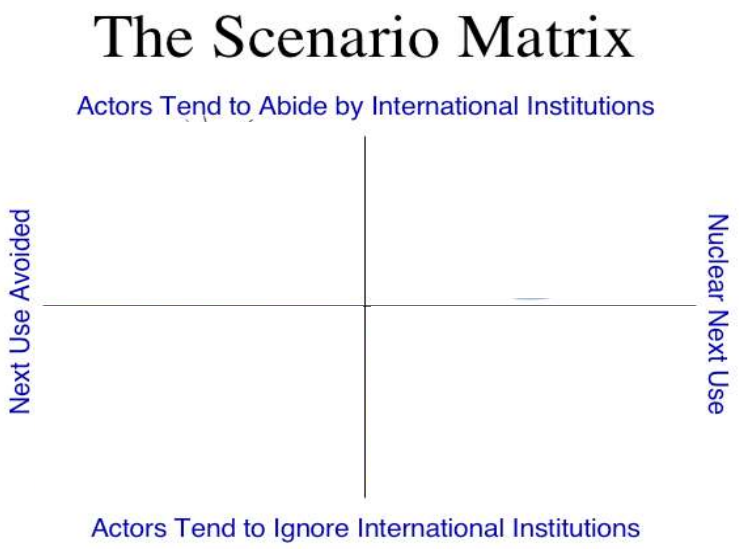

Figure One: Nuclear Next-Use 2015 Matrix

These characteristics are combined in four ways shown in Figure One to describe what the state of the world in 2015 would look like. Nautilus defined *nuclear next-use* to mean a world in which there are one or more detonations against human targets at any point in the time between today and 2015. *Next-use* does not necessarily mean a nuclear exchange; a single detonation without any subsequent use could eventuate in one of these worlds. *Next-Use Avoided* meant a world in which there was no detonation of a nuclear weapon against human targets, although a failed attempt to do so would still be a possibility.

Actors Tend to Abide by/Ignore International Institutions embraced the behavior of states and non-state actors alike, including civil society, terror groups, and corporations; this axis focused on, but was not limited to, the general tendencies of the bulk of actors. "International institutions" include not just global organizations like the United Nations, but trade agreements, treaties, "laws of war," and other transnationally-defined regimes, emerging norms and “soft law” restrictions. The facilitators cautioned the participants against assuming that a world where nuclear next-use was avoided was inherently pacific, and that actors ignoring international institutions meant automatic descent into chaos and conflict.

Thus combined, these axes generated four dramatically different worlds in 2015. The workshop participants spent much of the first day crafting and debating how each of these scenaric worlds would unfold, and creating "headlines" describing the important events in each world over the next ten years. See the Appendix for these key headlines in each scenario's timeline.

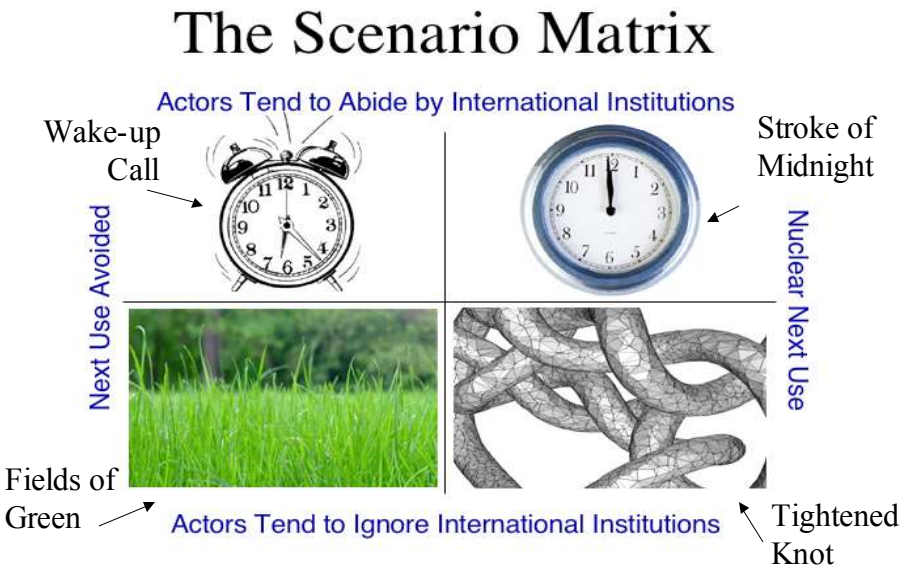

Figure 2: Nuclear Next-Use 2015 Scenaric World

World A: Wake-Up Call
Next-Use Avoided / Actors Tend to Abide by International Institutions
This is a world in which a tentative shift towards multilateralism is strengthened by a failed attempt at nuclear terror, which drives home the need for global collaboration.

World B: Stroke of Midnight
Nuclear Next-use / Actors Tend to Abide by International Institutions
This is a world in which the challenges of American unilateralism, global resistance to the *status quo*, and effects of climate change are capped off by a successful nuclear terror incident in the United States, which creates the conditions for a major shift.

World C: Fields of Green
Next-Use Avoided / Actors Tend to Ignore International Institutions
This is a world in which a non-nuclear terror attack in Europe and the behavior of a rogue American superpower trigger the development of a multiplicity of unofficial (and often women-led) civil-society movements for peace and international transparency.

World D: The Tightened Knot
Nuclear Next-Use / Actors Tend to Ignore International Institutions
This is a world in which terror, economic trauma, climate effects, and political tension all contribute to a general collapse in world order; the use of a nuclear weapon by an unknown actor against the Russian homeland is almost lost in the noise.

Entanglement: Are World Problems So Tightly Intertwined That Nuclear Next-Use

Is Inevitable?

In all the scenarios, someone used nuclear weapons (or tried and came close to doing so) against human targets although the initial impetus came mostly from non-state actors; and only the shock of near-nuclear next-use or actual nuclear next-use sufficed to force changes that avoided subsequent nuclear next-use. To understand why nuclear next-use is not inevitable, we need to examine the scenarios more closely.

First, despite participants' deep professional expertise in nuclear proliferation in North Korea, India and Pakistan, and the Middle East, none of the scenarios generated nuclear next-use arising from state vs. state conflict. In each case, the nuclear next-use (or near next-use) was carried out by non-state actors against a state or national entity. Such an event could then lead to state vs. state conflict because the state hit by such an attack may strike back against the nation believed to have provided the terrorists with nuclear capabilities (such an outcome was discussed by the "The Tightened Knot" team as a possible result of their scenario). The focus on non-state actors reflects both the anxiety of the current world situation and the recognition that political factors ranging from international and domestic pressure to effective nuclear deterrence can dampen down the possibility of state-level nuclear weapon use. Non-state actors — terrorists — may not be so responsive to these kinds of political effects, a perspective that is deeply embedded in all the scenarios.

After each story was presented to the workshop, participants confronted the sheer pessimism found in each scenario. Even *Wake Up Call*, which could have veered easily into a more optimistic non-nuclear scenario, includes attempted nuclear terror. The participants were struck by how readily they could imagine very bad outcomes in a very short time frame in the worlds they anticipated.

Another way to interpret this pessimism derives from the fact that three of the four scenarios postulated that a tragic event would be required to break people out of their mindsets about global cooperation regarding nuclear weapons (the fourth world, *The Tightened Knot*, was so filled with tragic events that a paradigm shift never had a chance). This view reflected both historical lessons and the difficulty of envisaging plausible pathways that avoid nuclear next-use. After both the nuclear bombings of Japan and (much more recently) the 9/11 terror attacks, most nations and people seemed willing to consider new, cooperative approaches to peace and security. In both cases, the potential for establishing the foundations for an enduring peace was quickly overtaken by new conflicts. As the workshop participants could not see (at least on the first day) an obvious and assured way to avoid nuclear next-use, they found that each scenario required a massive shock to at least avoid *subsequent* nuclear next use. In this light, that three of the four scenarios envisaged worlds that moved toward an improved outcome by 2015 (even if each had to go through a global disaster to get there) suggests that participants shared an underlying optimism.

Driving Forces of Deepening Entanglement

Each scenario offered interesting focal issues, “triggers” or “defining moments” suggesting levers for influencing the events that will determine our future history.

World A, *Wake-Up Call*, was the only one of the four scenarios to suggest that the Democrats might retake the White House in US elections. The focus of the scenario was on **international cooperation**. In that world, the US shift back to a multilateral global policy, cautious at first, was accelerated by the attempted nuclear terror incident, and embraced by an international community fearful of a continued "rogue superpower."

World B, *Stroke of Midnight*, took a more extreme path, with eight more years of American unilateralism capped off by a devastating nuclear terror episode, leading then to a domestic **political backlash** against failed leadership. The policies and events of the later years of the scenario are more radical and far-reaching than those of World A, but also had a more painful birth. World B is the only scenario to note the persuasive power of business institutions to shift American civic and leadership positions.

World C, *Fields of Green*, fear of American "rogue superpower" triggers the development of new models of global civil movements. Recognizing the growing use of information and communication networks as media for rapid, decentralized organization, the scenario painted a picture of **citizen power**, where civil society, tired of either failing or powerless leaders, takes matters into its own (collective) hands and pushes for radical changes. This scenario is the only one of the four to pay close attention to the role of non-state movements *other* than terrorists.

World D, *The Tightened Knot*, is an amalgam of many of our worst nightmares. Corrupt leaders, environmental disasters, economic ruin, terrorism on the rise, near-constant warfare around the globe — these elements are both all-too-plausible and almost too much to even consider. With an underlying theme of **failure**, this world is the only one of the four *not* to have a change in direction leading away from disaster.

Undoing the Knots

The goal of the Global Scenarios 2004 workshop was not just to come up with scenarios for nuclear next-use, but to figure out ways to avoid the very scenarios the participants created. Much as the first day began with an exercise in creating knots, the second day began with an exercise in untangling the snarls created the day before -- a process requiring the discovery of points of entry, moments of leverage, cooperation — and no cutting. This exercise served them well throughout the day's proceedings.

Few of the leverage points identified by the workshop participants had direct connections to nuclear weapons or their precursors. Instead, the teams embraced the notion that nuclear next-use would arise out of global conditions that would unintentionally allow, even encourage, non-state actor use of nuclear weapons. Rather than look at the details of how particular terror groups could be stopped from particular uses of nuclear weapons, the workshop instead examined the larger issue of how the global context might make nuclear next-use by a non-state actor possible, even (for that actor) desirable.

Five key points of leverage emerged from the group discussions. Two — *Role of Civil Society* and *Multilateral Action* —focused on ways to make it more difficult for hostile groups (state or non-state) to adopt a nuclear next-use posture by making it more difficult to act in secrecy, to act without civil response, and to act unilaterally. Another two — *Role of Middle Powers* and *American Policies and Actions* —focused on making nuclear next-use less likely by altering the global power and political relationships which could help bring on an attack. The last — *Technology and Resources* — touched on developments that could reduce the economic and political drivers of conflict and improve global abilities to monitor nuclear materials. Participants chose which of the five issues they wanted to discuss, and worked to develop specific policy recommendations on each

topic. The five key leverage points closely aligned with the five leading critical issues identified by the workshop participants early on the first day. The extent to which this similarity reflects the initial framing is unclear; however, the Day 2 scenaric process suggests that the result was independent.

The ***Civil Society*** group examined the ability of non-governmental networks to build global transparency (that is, the ability of concerned citizens to see and understand the actions of those with political, economic, and technological power). Increased transparency would serve both to counter the ability of state and non-state actors alike to act in secrecy and to build up communication and information links between global communities.

Specific policy suggestions included:

- Increase the use of so-called "**open source intelligence**," in which publicly-accessible documents (including commercially and freely-available satellite photos) are used by commercial and civil groups to analyze global events and movements. "Open source intelligence" groups can counter (or underscore) official policies and presentations, as well as draw attention to potentially unrecognized or underreported problems. Such services could be brought together to share analysis and insights, and combine their voices on critical concerns. Possible forms of such cooperation include networking between policing, intelligence and diasporic communities at the level of global cities; and monitoring and surveillance by border-crossers (daily work migrants, transnational working communities such as ship workers, maids, airline pilots and stewards, drug smugglers, youth gangs, and farm workers) of illegal networks that could support delivery of nuclear weapons.
- Emphasize the ability to "**watch the watchmen**" through digital information and communication technologies such as digital cameras, mobile phones, and the rapid dissemination of information via electronic mail and weblogs. The ability to capture an image or conversation and immediately distribute it globally has remarkable political impact. One policy innovation deriving from this would be the provision of digital cameras and camera-phones to political movements around the world, updating the "Witness" program started by Peter Gabriel in 1992.
- Build on "**smart mobs**" as a new model for political activism. "Smart mobs" use mobile telephones, instant messages, and text messaging services to self-organize protests. First seen in elections in the Philippines and South Korea, later in demonstrations against the WTO meeting in Seattle in 2000, and most recently in the Spanish elections after the Madrid bombings, smart mobs have proven effective in responding to official power and crackdowns. The smart mob model may prefigure an effective method of citizen response to a nuclear next-use event, and to protest against possible nuclear next-use by a state.
- Foster a **more feminine leadership style**, one that is more contextual, future oriented (the world of our children), less defined by competitive masculine power.

The ***Multilateral Action*** group looked at the degree of cooperation between states and large non-governmental organizations to reduce the ease with which nuclear material could be acquired (by non-state actors and rogue nations alike) and to reduce the incentives for existing nuclear powers to hold onto — or even expand — their stockpiles of weapons. By strengthening existing institutions for managing conflict and controlling fissile material, the international community would make it more difficult for hostile actors to find the necessary support for nuclear next-use. Expanding those institutions also would reduce the

ability and willingness of larger states to consider nuclear next-use as a viable political option.

Specific policy suggestions included:

- Strengthen, expand PSI (Proliferation Security Initiative);
- Focus media attention on need for multilateral action, sway public opinion;
- Increase responsibility and power of United Nations;
- Strengthen, expand other global and regional non-proliferation/security institutions (e.g., NPT, OAS, NATO);
- Build multilateral security agreements, reducing incentive for nuclear proliferation;
- Strengthen international control/management of nuclear arsenals, done through UN Security Council; and,
- Extend responsibilities of IAEA for monitoring ongoing traffic of nuclear material

The ***Role of the Middle Powers*** group considered the abilities of stable non-superpower nations to act as trusted, effective agents in international hotspots. Because they do not carry the political baggage of the American superpower or the historical legacies of the former European Great Powers, nations such as Canada, Mexico, Brazil, Korea, Indonesia, South Africa and Australia might have a greater chance of negotiating successful resolution of regional security conflicts and crises. They could also stand as secure, successful, and denuclearized role models for the developing world. The Global Scenarios 2004 participants suggested a number of specific initiatives that the Middle Powers could take which would reduce directly the threat of nuclear next-use:

- **Take the initiative** on key issues. In the Cold War era, many of the smaller or less-powerful nations tended to either "bandwagon" with one of the two superpowers or adopt a largely isolationist "neutrality" posture. In the current era, neither of these two policies is viable. Middle Powers can achieve a global reach without having global designs.
- South Korea, Australia, Canada should offer to buy out the North Korean nuclear program; (2) Canada, Mexico, and Brazil should take the lead on inter-American hemispheric denuclearization and border security; (3) Middle Powers should provide neutral meeting places as part of foreign policies, building up their potential as trusted arbiters; (4) the Middle Powers should prepare for *immediate* response to nuclear next-use or threatened next use anywhere, including the organization of multilateral "SWAT" teams; (5) small powers working with medium-power coalitions should specialize in providing specific conflict resolution services such as providing venues, facilitation, and back channels (Mongolia, New Zealand, and Costa Rica spring to mind).
- Have an annual **"G-X" meeting** after G-8 meeting. The informal coalition of Middle Power and developing nations known as the G-20+ serves as a counterweight to the economic power of the G-8. The focus of the G-20+ group, which is led by China, India, South Africa, and Brazil, is on economic development and political rights within WTO deliberations. The G-20+ concerns should be expanded to include broader political concerns, including proliferation. (Nuclear-armed nations currently in the G-20+ bloc may not want or be asked to participate,

which is why the group is referred to here as G-X.)

- Although it is not necessarily considered a middle power, the **European Union** and its constituent states should play the balancing role between the Middle Powers and the United States by setting global standards for management of fissile materials, alternative energy, and climate change issues.

The ***American Policies and Actions*** group addressed the question of how the behavior of the United States affects global outcomes, and the degree to which American unilateral policies act as triggers for hostile responses. Although it did not blame the United States for directly encouraging terror, this group recognized the interrelationship between global political conditions, American actions, and conflict. As the sole (traditional) superpower, the United States bears a great responsibility for the secondary effects of its actions and policies.

Specific policy suggestions included:

- **Change American leadership** and foreign policies: The workshop participants repeatedly cited American unilateralism as a trigger for both hostility from regions and organizations already prone to anti-Americanism and resentment from former allies. Although the former could increase the likelihood of nuclear next-use against the United States by non-state actors, the latter is in many ways even more troubling. The growing political wedge between the United States and its allies could hinder intelligence-sharing and cooperation on anti-proliferation efforts, thereby making it harder to stop the spread of nuclear material, know-how, and programs. Few workshop participants held out hope that the incumbents of the White House would abandon this damaging unilateralism.
- The United States should **withdraw its forces from Iraq** as quickly as possible. This is a specific case of the more general move away from unilateralism. American presence in Iraq, no matter the degree to which it may once have been supported by the Iraqi people, now harms American interests. The possibility of Iraq becoming a "failed state" (akin to Somalia) must be balanced against the possibility of Iraq being successful without the American presence, and against the likelihood that continued occupation will further enflame anti-U.S. and anti-West hostility.
- Although less directly related to nuclear issues, the participants felt that American global **corporate and economic policies** should be changed, with a decisive shift away from the use of the WTO as a means of influencing the developing world's economies.

The ***Technology and Resources*** group explored how limited resources (particularly energy resources) and uneven international development create the conditions that make nuclear next-use a real possibility. In turn, they also looked at the ways in which creative application of current and emerging technologies could counter these conditions. Although alternatives to petroleum-based fuel consumption were prominent in this group's suggestions, the participants also explored alternative models of intellectual property rights and collaborative innovation as tools for spreading development.

Specific policy suggestions included:

- Aggressively push **technological and social efforts to "devalue" oil** and shift

away from carbon-producing fossil fuels. This could include American ratification of the Kyoto Treaty, but the suggestions included in this category go far beyond that agreement. The United States (and its component states) should eliminate subsidies to fossil fuels and implement a gradual carbon tax. The moneys generated would be used for both environmental mitigation and to subsidize low-income citizens hurt by the tax burden. The same policy would be applied outside of the United States.

- Stop World Bank funding for fossil fuel energy programs, and **shift focus to renewables and "cleaner" technologies**. These policies would eventually form the framework of an "American Sustainable Energy and Independence Plan," with specific legislative guidelines. Now thatChina is rapidly coming close to American oil consumption levels, participants also suggested accelerated international cooperation with China on transportation and car development, and exchanges of "best practices."
- Shift focus to **efficiency** as a key economic indicator, with federal efficiency mandates on cars and new construction, as well as efficiency labeling on products. Short-term policies would include promoting the diffusion of *existing* cleaner technologies. Medium-term policies would include the redesign of large systems (such as transportation, urban housing, energy networks, and the like) to promote efficiency. From a consumer perspective, this would be marketed as "LOHAS" — "Lifestyles of Health and Sustainability."
- Support **public funding** for research and development, particularly R&D using collaborative-innovation technologies, which rely on distributed knowledge and participation. Corporate inducement could include tax breaks for *non-proprietary* research and development. Non-corporate approaches would include cooperation between foundations, SRIs (Socially Responsible Investors), and donors to promote non-proprietary innovation in sustainability and development (perhaps under the flag of an "energy efficiency Linux").
- Build **organizational capabilities** of environmental non-governmental organizations (NGOs), particularly through collaborations and partnerships between environment/energy and peace/security NGOs. NGOs working on nuclear and security issues and environmental NGOs have much in common and could take advantage of the other's policy expertise, activist networks, and political access. Nuclear issues cut across energy, environment, and security agendas, and cooperation between concerned NGOs would lead to better results than disparate, uncoordinated approaches. The same, of course, applies to donors.

Taking Action

The policies suggested by the participants at the Global Scenarios 2004 workshop varied considerably in practicality, plausibility, and specificity, but the scope of the suggestions was impressively broad. Arguably, only wide-ranging and multiple initiatives in many dimensions and directions is commensurate with the tightly tangled, opaque, and intractable problem of nuclear next-use. From social movements to international institutions, from small and middle power innovations to superpower behavior, and from new ideas combined with traditional wisdom on how to control triggers for conflict, the workshop policy suggestions recognized both the complexity of the nuclear next-use problem and the wealth of tools available to solve it. Not all of the proposals could be

implemented, but some are [stand out is in next sentence again] essential and persuasive, and help us answer our focal question of "who will stop nuclear next-use?"

Various groups or communities stand out as being responsible for pulling on these "levers of influence." They vary in power and social roles, but all can play important parts in the prevention of nuclear next-use. However, in order to be able to take advantage of their influence — or to get the desired results from its use — these groups will need to take some necessary steps:

Technologically Empowered Civil Society Networks: National leaders are not the only ones responsible for global security; everyone is. Traditional forms of civil society networks such as cultural and communication exchanges can be useful means of reducing international tensions, but the rise of the Internet allows for more innovative approaches.

- Take advantage of "open source intelligence" resources to both keep an eye on state leadership and act as independent "watchmen" during times of threat.
- Work to bridge the gap between traditional political movements and new, technologically oriented, networks, with an eye towards combining the contacts and influence of the old with the flexibility and responsiveness of the new.
- Be prepared to act as communication networks in the event of an attack (text message systems being one of the few networks that worked during 9/11 in New York).

Developers of alternative energy systems: The developed world's demand for oil, which largely comes from instability and conflict-prone regions of the world, leads inexorably towards a cycle of military intervention and hostile reaction.

- Expand efforts leading to near-term oil use reductions, such as energy efficiency, hybrid vehicles or non-traditional sources such as bio-diesel.
- Look for ways to combine political efforts with security/peace movements, as in Korea and Kashmir.
- Take advantage of markets in newly developed regions (for example, China, South Asia, South Africa) that are willing to "leapfrog" and adopt new systems instead of old.

Diplomats/leaders willing to embrace multilateral action: Nuclear next-use is a collective global problem requiring collective global action. No one nation can change the conditions that permit and motivate nuclear next-use by non-state actors. Only collaboration between governments, international institutions, and civil society can do so. Religious and educational institutions bear a particular responsibility in this regard.

- Work to rebuild responsibility and power of United Nations
- Extend responsibilities of IAEA for monitoring ongoing traffic of nuclear material
- Strengthen, expand PSI (Proliferation Security Initiative).

Non-superpower national leaders willing to embrace non-traditional roles: The non-superpowers — in particular, the "middle powers" such as Brazil, India, South Africa, and the like — cannot rely on the United States, Europe, or China to take the lead in countering the possibility of nuclear next-use. Middle powers may be better suited to do so, in fact.

- Adopt a "global responsibilities without global ambitions" approach, working outside of own region to act as neutral agents in discussions.

• Strengthen (perhaps formalize) the G-20+ (or G-X) coalition to take on greater international issues.
• Move decisively away from reliance upon nuclear deterrence and nuclear energy, take lead on material control protocols.

The American electorate: American unilateralism is dangerous; for multilateral action to be effective, American unilateralism must be inhibited. America's leadership should change its approach to the world; if it chooses not to do so, then the American populace should choose new leaders.

• Demand that elected officials restore nonproliferation effort funding.
• Choose leaders who embrace global cooperation over global dominance
• Engage in reasoned public discussion on rooting out causes of anti-American hostility and terrorism.

Stopping Next-Use?

It may be that nuclear next-use is, in the end, unstoppable. The efforts described above to reduce the possibility of nuclear next-use will take time to unfold, and even if they are successfully brought about, the period until they begin to have their desired effects will still be uncertain and dangerous. Any nuclear next-use we see over the coming decade will have roots stretching back well before the present-day.

But in many ways, the points of leverage and entry the Global Scenarios 2004 workshop imagined have less to do with stopping nuclear next-use than with stopping the *next*-use beyond that. As horrific and painful as a nuclear attack upon a city would be, it would pale in comparison to an exchange of attacks, or a series of nuclear uses, against city after city. If a nuclear use does take place, we need to be certain to learn the correct lessons from it, certain to take advantage of the tragic opportunity to make sure that there is no subsequent use.

Yet the results of the workshop give us the hope that hard efforts can be rewarded. The scenarios crafted by the workshop participants, and the policies and initiatives they proposed as a result, make it clear that — if we choose to do so — we can plant the seeds now that will eventually shift the course of the planet. Nuclear next-use can be stopped, given enough time. We should not wait for such ultimate tragedy to push us in the right direction.

Appendix: Workshop Lists

Participants:

This report is a document of the Nautilus Institute for Security and Sustainability and the result of a structured process involving a diverse group of scholars, analysts, and policy makers. This is not intended to be a workshop report. Participants in the workshop reviewed the document to ensure that the descriptions of the four scenarios and seven strategies fairly represent the discussions in which they participated. In summary, ***workshop participants are not responsible for any part of this report.***

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The Critical Issues Brainstorm
Demographic change, particularly increase of men in their "testosterone" years
Old "white" world and young Islamic world
Disease outbreak, ala 1919 Flu
Global Warming, sea level rise, etc.
Rising fundamentalism
Backlash against globalization, collapse of WTO
resource crises, water wars
vast increase in every conceivable kind of
surveillance/sousveillance
fall of superpowers
shift to feudal system of fortress states
greater networking and coordination of activists
spiritual awakening
decline of terrorism - success of war on terror, or people abandon its use
privatization of war
off to the cities - rise of megacities
China and CO2
global economic breakdown that starts in China?
Euro v. $
biological attack that demonstrates economic harm
quarantine and costs thereof
renewable and competitive sustainable energy source
emerges
Iran abandons nuke program becomes a modern democracy
certain diseases could be eradicated
Regime change in the US
worldwide education opportunities increased through
technology
China and India
Brasilia consensus
IP (IP as bubble)
Southern science
Racial composition of developed world changes
Microcredit and livelihood-based development
Israel-Palestine agreement
OECD passport
cities, not states, as security centers
no secrets - total transparency
oceans - main source of protein, and location of
Global superstorms
global open source technology
and open source beyond computers
collapse of the House of Saud
assassination of Kerry
rise in corporate power
nano, bio, robo, fabber - end of scarcity

global youth culture??
major victory *against* the US
Border flows
Nuclear modernization
Increase/decrease in the number of nuclear states
Failure to control stockpile
Increase/decrease in the number of regional wars
Increase/decrease in the number of great power interventions
Major nuclear weapon accident
Rise in lethality of conventional weapons
Increase in nuclear weapon transparency
A nuclear-armed state collapses
Extra-planetary threat (asteroid impact)

Scenarios

World A: Wake-Up Call

Key Headlines:

• (2004) Kerry elected.
• (2005) Six Party Talks in North Korea successful, Northeast Asia security framework emerges.
• (2007) Iran begins to cooperate with international community on nuclear issues, Iraq stabilizes under UN supervision, Middle East begins slow shift to stability, also with growing UN role.
• (2008) Attempted detonation of improperly-designed nuke in United States. Muslim groups blamed initially, but homegrown terror real culprits, using fissile material gained abroad.
• (2008) A stronger peace/anti-nuclear movement emerges.
• (2009) South Asian Arms Reduction Initiative (SAARI) leads to weapons reduction treaty between India and Pakistan.
• (2010) Push towards greater international transparency.
• (2012) United Nations emerges as a strengthened multilateral institution.
• (2014) SAARI used as model for regional denuclearization efforts globally.

World B: Stroke of Midnight

Key Headlines:

• (2004) United States remained mired in Iraq; Bush re-elected.
• (2005) Global warming-related droughts lead to resource conflicts.
• (2005) Widening gap between global rich and poor.
• (2007) Renewed hostilities between India and Pakistan lead to nuclear alert; both sides stand down forces after diplomatic intervention from European Union and China.
• (2008) Jeb Bush elected president; European Union walks out of G-8 conference in protests over American unilateralism.
• (2010) Al Qaida-linked nuclear terror attack on Chicago, 150,000 dead. London, Milan, Melbourne, other cities threatened.
• (2010) USA and EU propose competing approaches to fighting terror; American business leaders call on Bush to work with Europe. Pakistan and India each make "no first use" pledge.
• (2012) Domestic crackdown in United States, rejection of Bush in election.

• (2013) President Rodham embraces European approach to fighting terror, slow restoration of multilateral ties.
• (2014) Global push towards renewable energy sources; WTO adopts a "development" model; increased global cooperation on peace and security efforts.

World C: Fields of Green
Key Headlines:
• (2004) Massive non-nuclear terror attack in Europe kills numerous EU leaders.
• (2004) Bush is re-elected on basis of having "protected" USA from similar attacks.
• (2005) Europe in disarray, USA moves to assert authority over international institutions.
• (2005) Middle powers accelerate programs to gain nuclear weapons. "South Asian Nuclear Race" now is competition to hire out expertise. Many scientists refuse.
• (2007) New, often bilaterial, civil society efforts to reduce tensions and increase transparency emerge around world, ignoring American efforts to rule through UN.
• (2009) Many of the new movements have strong female character.
• (2009) "South Asian Nuclear Exchange" formed, a nuclear scientists' peace movement.
• (2010) Secret American plan to use micro-nukes (0.25 kiloton) against middle power nuclear installations exposed by First Lady, who announces solidarity with women's peace movement.
• (2013) Push by global peace networks to force states to adopt greater nuclear transparency.

World D: Knotty Problem
Key Headlines:
• (2004) USA pulls out of Olympics, citing terror fears; Bush re-elected.
• (2005) Non-proliferation regime collapses, multiple nations pull out of NPT.
• (2005) Taiwan declares independence and reveals nuclear arsenal.
• (2006) Iran openly leases North Korean nuclear weapon technology.
• (2007) Pakistan, India, once again raise tensions over Jammu-Kashmir.
• (2008) "Superstorm" wipes out Mumbai; India goes on nuclear alert to deter Pakistan from trying to take advantage of environmental chaos.
• (2008) Olympics in China proceed while USA-Iran tensions rise.
• (2009) String of unrelated major terror attacks globally.
• (2009) Washington DC, San Francisco both devastated by non-nuclear explosions.
• (2009) Martial Law declared in USA.
• (2010) WTO suspended, resulting in regional resource grabs.
• (2010) Brushfire conflicts around the world.
• (2010) Oil hits $80/barrel; production begins radical decline.
• (2011) Pakistan collapses, becomes Islamic nation. Warns India of "cleansing fire" if India does not pull out of Kashmir.
• (2012) Russia moves into Middle East with support of China.
• (2013) Radiological "dirty" bomb hits Moscow.
• (2013) America closes borders with Canada, Mexico.
• (2015) India-Pakistan discussions break down.
• (2015) "Unsigned" nuclear blast levels Moscow; Russian forces go on full nuclear alert.

Leverage Points

Mobilize Scientific Network
Shock event used to eliminate nukes
Grassroots networks
Citizen groups
South Asian Nuclear Exchange (scientific cooperative group proposal)
Capacity to Respond to traumatic events
(NGOs, media/culture, civil society)
Formation of More cohesive civil society networks
Global interdependence/inter-penetration
Pull out of Iraq
Reduction in US unilateralism
Shift in US leadership
Change in US appetite for peace
Expanding technologies
US leadership & behavior
Strengthen PSIs
Middle Power initiatives
Technology innovations will devalue oil
Shifts in domestic US issues (demographics, economy, etc.)
Shift in US corporate views
Alignment of small powers
EU changes in direction, global order
G20 strengthened
Great power cooperation
Deflect consequences Afghan/S Asia
Stability Maintained vis-à-vis Multilateral frameworks

About the Workshop
Scenarios are tools for ordering one's perceptions about alternative future environments in which today's decisions might play out. Unlike traditional forecasting or market research, scenarios present alternative images instead of extrapolating current trends from the present. Ultimately, the end result of scenario planning is not a more accurate picture of tomorrow, but better decisions today. On April 27-28 2004, the Nautilus Institute convened its 3d annual Global Scenarios Workshop that sought to identify specific policies and strategies for answering the question "Who Will Stop Nuclear Use?" The Nautilus Institute 2004 Global Scenarios Project was funded by the Carnegie Corporation of New York, the Ploughshares Fund, and the Compton Foundation.

About the Nautilus Institute
The Nautilus Institute's vision is a peaceful, ethical, and sustainable world. Our Mission is to improve global problem solving by applying and refining the strategic tools of cooperative engagement to fundamental problems undermining global security and sustainability. We believe that the key to reducing global insecurity lies in a global civil society committed to joint problem solving. The Nautilus community is a global network built around this strategy of collaborative engagement.

For more information on the Nautilus Institute, please visit: http://www.nautilus.org