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**Nuclear Risks – Accidental Nuclear War**

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I have six minutes.

Six minutes is around the same time that a commander of missile forces, a defense minister, or a President, has to decide, after a 30 second briefing (for the US President) whether or not to launch about 2000 nuclear warheads (around 900 on – alert in silos in the US and Russia, plus submarine-based warheads) as early – warning systems indicate – likely incorrectly – that the other 'side' has launched.

If it is indeed true that the other 'side' has launched, then it is indeed the end of what we know as 'the world'. If (as is quite probable) the incoming missiles are merely a computer glitch, and 'our' side launches anyway, it will just as surely be the 'end of the world' as the 'other side'--if acting in accordance with “deterrence” theory-- will certainly launch in response, making our belief that the end of the world has arrived self-fulfilling.

Even if the other side does NOT launch in response, the smoke from 'their' burning cities will still make 'OUR' country (and the rest of the world) uninhabitable, inducing global famine lasting for decades. (Self-Assured destruction by Alan Robock, BAS) A conflagration involving US/NATO forces and those of Russia would most likely cause the deaths of most humans (and severely impact/extinguish other species) as well as destroying the delicate interwoven techno-structure on which latter-day 'civilization' has come to depend. Human survival itself could be arguably problematic under a 2000+ warhead US/Russia scenario, though human ingenuity and resilience shouldn't be underestimated.

The destruction of the information-based techno-structure and the complete disappearance of the global financial system could be accomplished with a very few large warheads (such as the Chinese DF5, of 5Mt) exploded in space, with the effects of Electromagnetic Pulse. (in fact results of EMP can also be duplicated by a very large coronal mass ejection such as took place in 1859. A study by the US Congress indicates that in either event, up to 90% of US citizens might starve to death. This, without the destruction of a single city. Most studies say that electronic systems in the entire continental US could be crippled by just one large warhead exploded about 400Km out in space.)

Even a 'boutique' India/Pakistan nuclear exchange, involving 100-200 Hiroshima-sized warheads, could put of up to 2 billion people worldwide at risk of death from famine.

But just how likely really is such a scenario? Surely it's just science-fiction with which NGOs frighten

roomfuls of diplomats? How likely really is a completely catastrophic event-sequence?

Firstly, as I'm relatively innumerate and am not Seth Baum (who will be presenting with me at a panel on 6 May at 1pm), or Prof. Martin Hellman, on both of whose highly numerate analyses I have largely depended, I am not going to try to give you a number which anyway may not be that meaningful. But some common-sense things can be said nonetheless about catastrophic nuclear risk.

--Risk is not simply a function of the probability of a given event, but is a function of probability times consequences, or 'r= p X c'.
This means that even if the probability of a global nuclear exchange is relatively low, the consequences are so grave that only a probability of zero or very close thereto can be acceptable.

--Even if the probability of an accidental apocalypse seems reasonably low (say, 0.1%-1%) in any given year, if this is taken over an indefinitely large number of years, the risk approaches asymptotically to 100%.

--Nuclear risk has PALPABLY increased in the last 2-3 years, with the most obvious signs being the movement of the hands of the Bulletin of Atomic Scientists 'Doomsday Clock' from five minutes to three minutes to midnight. In addition there have been a series of articles on nuclear war risks and nuclear deterrence in Der Spiegel (arguing that nuclear war risks now are HIGHER than during the cold war), the Guardian, Foreign Affairs, The Economist, and others. The clearest driver of increased risk is of course, the current crisis in Ukraine, with the associated nuclear threats. Even to make such threats in and of itself arguably considerably increases risk.

--Minuteman missile forces and Russian strategic rocket forces (as well as Indian and Pakistani nuclear forces) rehearse the 'apocalypse' on a regular basis. It's not imaginary for them. It's what they DO.

Missiles are fired from test sites, from missile silos, and from mobile launchers and submarines, a number of times a year by both the US and Russia. Most recently, these tests-cum-exercises have become increasingly public and threatening: Almost a form of political theater. It is a paradox of deterrence as routinely conceived– in my view a fatal paradox – that in order to maintain 'strategic stability' we have to (incredibly but really) threaten the end of the world. In order to keep the end of the world off the agenda (i.e., frighten our potential adversaries into not doing anything we don't like) we have to keep the end of the world ON the agenda. But that means that the end of the world is indeed, ON the agenda…an absurd and fatal paradox. US and Russian exercises along the borders of the Baltic states should give rise to very deep concern.

--There have already been too many 'near misses'. Deterrence depends on the impossibility of such mistakes. Statistically speaking we probably already shouldn't be here, and a study of those near misses leads one to conclude that the only reason we ARE here is by what General Lee Butler terms 'Divine Providence'. Without committing to any particular theology, we might well profitably ask, 'just when does our miracle supply run out?'

Obvious 'near miss' incidents include a number of sub–incidents during the Cuban Missile Crisis in one of which WW-III was nearly initiated by a wandering bear; incidents with computer tapes for 'doomsday' in 1979, and with a malfunctioning computer chip in 1980 and 81 (it happened three times). On the Russian side there was the famous incident involving Col. Stan Petrov of Sept26 1983; the Able Archer war scare just over a month later, and the Norwegian Weather Research Rocket incident of 1995, in which we are reputed to owe our existence to an unknown adviser who said 'excuse me Mr President, let's wait another minute'.

These incidents are described in greater detail in the Chatham House publication 'Too Close for Comfort', launched in this very place, as well as in a number of my own panel presentations.

In recent years, greater attention has been given to the possibility of cyberspace attacks on nuclear command and control systems. The Vienna conference was addressed on that subject by Camille Francoise, and Jason Fritz addresses the problem in Hacking Nuclear Command and Control, written for the ICNND. The issue of cyberspace risks is addressed by a resolution adopted by the IPU, whose membership includes members of parliaments of both nuclear-armed states and those involved in 'extended deterrence' relationships.

A number of things can be done to eliminate or reduce nuclear risk.

--First of all nuclear weapons can and should be eliminated yesterday. If nuclear weapons no longer exist then the risk of a catastrophic nuclear conflict, deliberate or inadvertent, can only be zero,at least in the short to medium term. This does not mean that all conflict will cease or that nirvana will instantly ensue. It merely means that lesser conflicts will no longer pose the risk of spiralling into an event sequence that risks human survival itself.

Nuclear weapons are an existential threat to all humans including those not directly involved in any conflict. They must be treated as such and outlawed.

--Secondly, various stopgap risk reduction measures can be taken on the understanding that they are mere way-stations in a rapid movement to the complete elimination of nuclear weapons.

These include:

--No longer targeting cities. Cities are not only the place where civilization 'lives' in the most real sense, but if targeted they are in addition the source of the bulk of the 180million tonnes of dark black smoke that will blot out the sun for decades after a large scale nuclear exchange. Mayors For Peace has detailed proposals about this contained in the Ypres Declaration.

--Taking nuclear weapons off high alert. I mentioned the six minutes of decision-making time which I've probably exceeded. This is an artifact of quick-launch, high-alert procedures that leave no time to

ascertain whether or not an indication that the other has launched is really really the end of the world approaching at three times the speed of sound, or merely a malfunctioning chip someplace. Much discussion has already taken place about increasing decision-making time, but lowering alert status is precisely about increasing decision-making time.

--Establishing the Data Exchange Center that the US and Russian Governments have now agreed to set up three if not four times (first agreed in 1998 in the aftermath of the 1995 Norwegian research rocket incident), but which still has not been established.

--Moving the patrol areas of SLBMs further away from potential targets.( Mosher Schwartz and Howell 2003) This would certainly increase warning times and make fingers on triggers less itchy.

--No First Use agreements/declarations.

Whatever we do – and some action is always better than none in this department though ALL of the above and more should be implemented as part of a quick path to zero – the catastrophic risk posed by nuclear weapons has always been nonzero, and has recently grown, probably by orders of magnitude.

Sooner or later the miracle supply really will run dry.