

Trident, nuclear winter and the delusion of deterrence

Dr Philip Webber



<http://www.sgr.org.uk/>

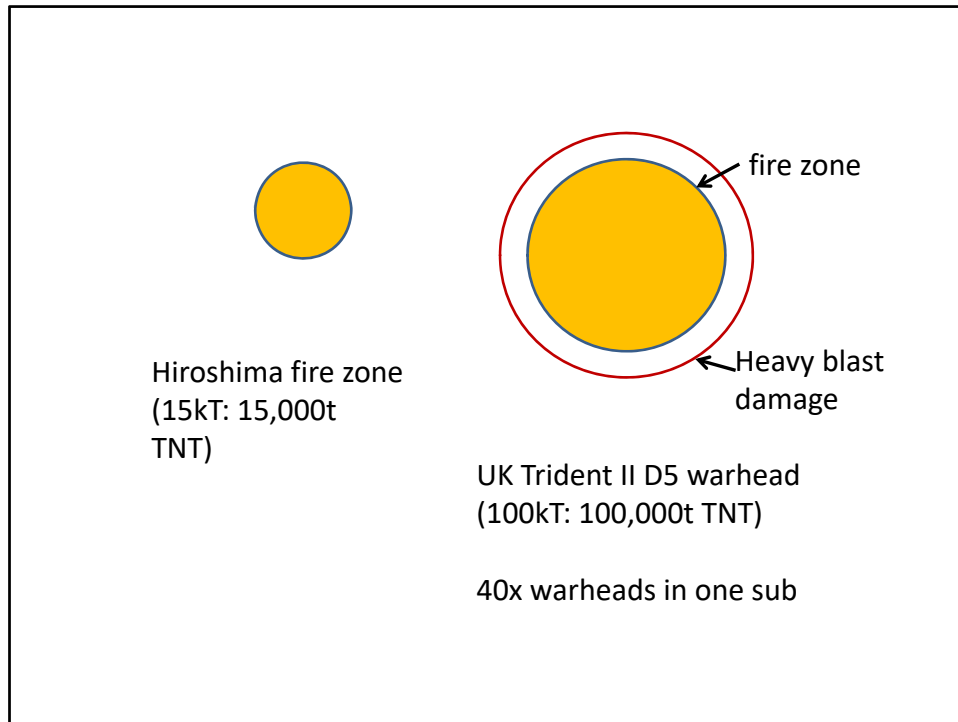
These slides are an update of 'Climatic and humanitarian impacts from the use of UK nuclear weapons' as presented at the Heath Through Peace conference, York University, 5 September 2017. This version clarifies some of the explanation/diagrams.

Hiroshima bomb over York

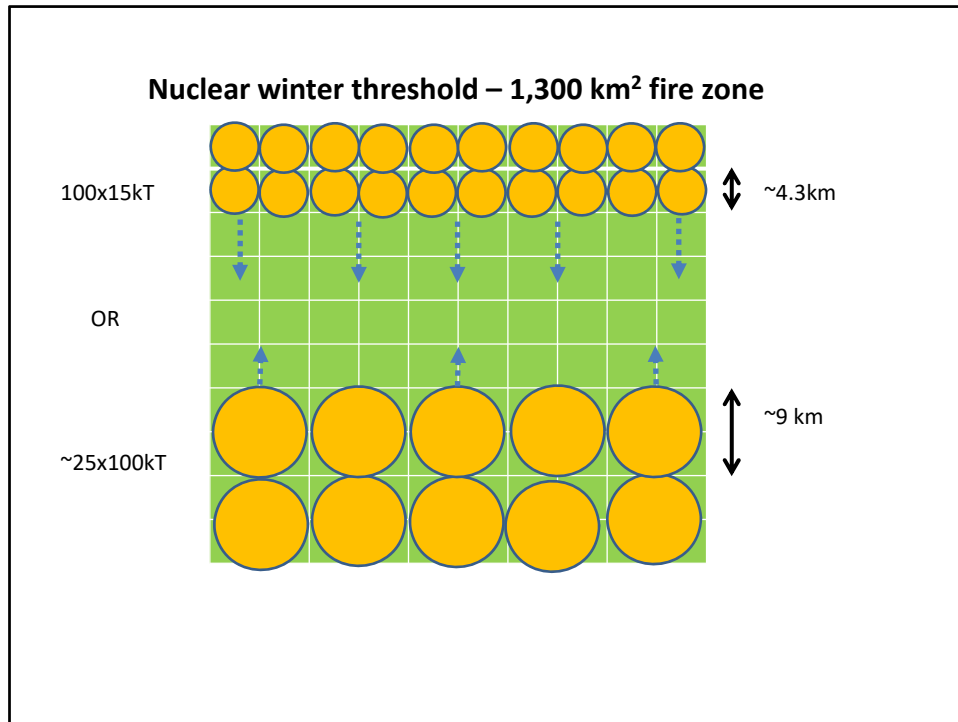
Extent of severe fire zone and heavy blast damage



Extent of fire zone and heavy damage (2psi - pounds per square inch). By today's standards the Hiroshima bomb was small...



Trident warhead fire zone: approx. 4 times larger in area; scales to the power of 0.8.
 Blast zone scales to the power of 2/3 (volume effect).
 5psi blast zone: ~1km for Hiroshima; ~3km for Trident



Schematic of 100 Hiroshima fire zone area - equivalent to ~25 Trident D5 warheads. Postol suggests a possibly 4x larger Trident fire zone than using thermal intensity scaling – scaling to Hiroshima compensates for this.

Regional nuclear conflict references

Multidecadal global cooling and unprecedented ozone loss following a regional nuclear conflict

Michael J. Mills, Owen B. Toon, Julia Lee-Taylor, and Alan Robock, 2014
Earth's Future, 2, 161–176, doi:10.1002/2013EF000205.

Atmospheric effects and societal consequences of regional scale nuclear conflicts and acts of individual nuclear terrorism

O. B. Toon, R. P. Turco, A. Robock, C. Bardeen, L. Oman, and G. L. Stenchikov,
Atmos. Chem. Phys., 7, 1973–2002, **2007**
www.atmos-chem-phys.net/7/1973/2007/

Nuclear Weapons in a Changing Climate: Probability, Increasing Risks, and

Perception, Adam J. Liska, Tyler R. White, Eric R. Holley & Robert J. Oglesby
2017, *Environment: Science and Policy for Sustainable Development*, 59:4, 22-33, DOI: 10.1080/00139157.2017.1325300

Forecasting nuclear winter, P Webber, **2007**, *Bull. Atomic Sci Sep/Oct* p.5-6

Key findings of regional nuclear conflict study (Toon et al):

- ❑ NB: 8-10m casualties from 10x Hiroshima sized detonations

**Study scenario: 100x Hiroshima sized weapons
(~50% of India-Pakistan arsenal)**



- ❑ 1,300 km² severe fire zone, injecting ~5m tonnes black carbon in stratosphere
- ❑ Sudden drop in surface temperatures (average of 1.5C) lasting >7 years
- ❑ Coldest temperatures for 1000 years,
- ❑ Massive 30-80% loss of ozone
- ❑ Killing frosts reduce growing season for 10-40 days for 5 years & drought
- ❑ Major impact on global ecosystems - potential to trigger global famine

Extremely high casualties from 10x Hiroshima scenario is a result of targeting urban areas with extremely high population densities.

Impacts of UK nuclear weapons use

- ❑ One UK submarine carries at least 40 Trident II D5 100kT warheads
- ❑ Only ~25 warheads would create a 1,300 km² fire zone (the 100x Hiroshima scenario) and 5m tonnes carbon
- ❑ 40 Trident w/h likely to inject 5-10m tonne carbon depending on combustible material loading and fire spread assumptions.
- ❑ We also find at least 4m fatalities and 10m casualties across 10 or more cities.
- ❑ Total explosive power huge - greater than 6 years of WW-II !!
- ❑ Radioactive fallout over large areas - especially from nuclear reactors



Combustible loading in Russian cities ~60% of India/Pakistan

Study implications for UK nuclear policy of deterrence

- Difficult to argue that UK Trident is a 'minimum deterrent'
- Clear breach of humanitarian conventions : civilians a target, impacts beyond target areas, disproportionate impacts
- Humanitarian arguments not new but have a new force because of the UN nuclear ban treaty supported by 120 nations.
- UK Gov't tries to sidestep this with concept of 'nuclear deterrence'
- UK NW 'work every day' - don't need to be detonated - so no breach of humanitarian principles.

Problems

- 1: even if nuclear deterrence did 'work' – one day it must fail...
- 2: If it is so effective why does the US with 4,000 deployed warheads feel threatened by Kim Jong Un and a handful of crude nuclear weapons?
- 3: Hypocritical: our possession OK - your possession not OK
- 4: Delusional: ignores the threat felt by others which increases insecurity

Mention the idea of "Winter safe" deterrence: Seth D. Baum (2015) Winter-safe Deterrence: The Risk of Nuclear Winter and Its Challenge to Deterrence, Contemporary Security Policy, 36:1, 123-148, DOI: 10.1080/13523260.2015.1012346

'Nuclear deterrence': could NW ever be an asset?

Are UK NW required to deter conventional attack? - NO

- Clear NATO superiority – even excluding US
- European NATO: 4xRussian military spend, US: 10xRussian spend
- NATO & US armies larger
- Hasn't deterred several conventional conflicts – some in Europe (Balkans)

To deter major nuclear conflict? - Irrelevant

- 1800 warhead ready-to-fire nuclear stand-off between US and Russia
- UK NW have no impact on this high risk of global nuclear destruction
- NB: in all US, Russian, Chinese NW scenarios – total destruction of UK

To deter 'regional' nuclear conflicts or accidents? – Irrelevant or worse

- UK NW cannot deter disastrous nuclear war in Middle or Far East
- UK NW cannot deter accidents, misperceptions – UK NW *increase* risk

Domestic / NPT politics? – YES/maybe!

- Totem or symbol of military might in UK debate or at NPT – Yes – so far...
- Useful at UN? No – not by a majority – possibly supported only by the nuclear armed & nuclear alliance states (NATO etc).

The five original nuclear armed states are permanent members of the UN security council – this confers 'status' on nuclear weapons.

Putting the legal and moral arguments to one side for a moment – could or do UK NW act as supposedly intended?

Current UK military & nuclear policy

- ❑ UK military policy is one wedded to long-standing symbols of power – nuclear weapons and giant aircraft carriers (currently without F-35 aircraft)
- ❑ Symbols of power do not mean that you are actually safer – they also inhibit intelligent thought processes via reinforcing ‘group-think’ delusions
- ❑ UK has a policy of involvement in air and troop based invasions with US: Afghanistan, Iraq, Libya, Syria.
- ❑ We are less secure as a result – not more.

Misleading use of language - nuke speak

- ❑ ‘Minimum nuclear deterrent’ or ‘nuclear umbrella’ – UK NW are no umbrella nor minimum. UK NW are an unstoppable mega death threat.

**A better nuclear and military policy for the UK -
Develop a *real*, sustainable security programme:**

- Abandon irrelevant nuclear symbols. Our stocks of Pu and HEU will always mean we have the ability to create WMD – like dozens of other countries (who choose to not do so).
- Better to ‘use’ NW not as a false deterrent but as a symbol of a safer world – by choosing to abandon the false path of actively threatening nuclear destruction.
- Join the likes of Brazil, S Africa, Sweden, Argentina who stopped active weapons programmes. Join 122 other nations & UN ban treaty
- Adopt a defensive military posture and influence NATO.
- Free up resources to improve everyday human security by addressing urgent health, social and housing needs.

More on this topic: Dr Scilla Elworthy Conway Hall 7.00 pm 2nd October Conway Hall, London

<https://www.eventbrite.co.uk/e/the-business-plan-for-peace-making-possible-a-world-without-war-tickets-33630002242>

Further reading and useful links – all have detailed source references

Nuclear weapons: a beginner's guide to the threats (SGR, 2017)

<http://www.sgr.org.uk/resources/nuclear-weapons-beginner-s-guide-threats>

Trident, Deterrence and UK Security

<http://www.sgr.org.uk/resources/trident-deterrence-and-uk-security>

The total explosive power of all the bombs dropped in World War II: estimated by US and Russian physicists to be about 3,000,000 tonnes (3,000 kT) of TNT. p19 of: Schlosser E (2013), *Command and Control*. Penguin.

“Winter safe” deterrence: Seth D. Baum (2015) *Winter-safe Deterrence: The Risk of Nuclear Winter and Its Challenge to Deterrence*, *Contemporary Security Policy*, 36:1, 123-148, DOI: 10.1080/13523260.2015.1012346

UK nuclear weapons: a catastrophe in the making? SGR (2015) Webber P, Parkinson S

<http://www.sgr.org.uk/resources/uk-nuclear-weapons-catastrophe-making>


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