The Need for a Public "Explosion" in the Principles of Nuclear Ethics

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Part I

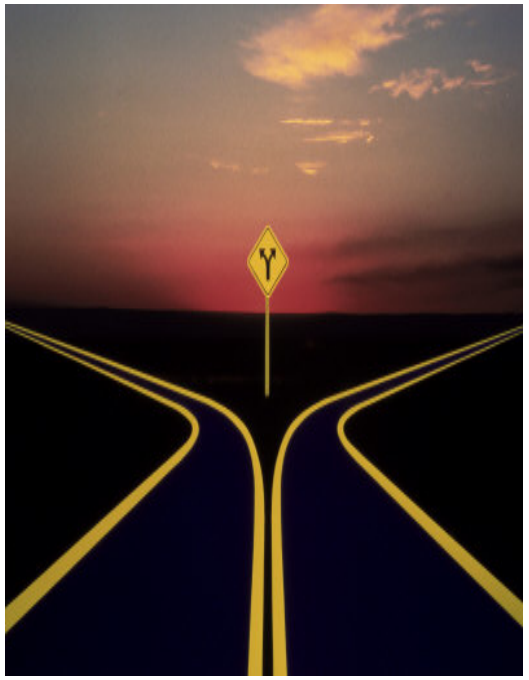
Introduction

Context

Nuclear Energy at a Cross-Roads

- Pro-Nuclear Climate Greens
- Anti-Nuclear Health Greens

Centrality of ethical arguments



Where Are We with Nuclear Protection?

- "the system of protection established by and large in its present form several decades ago has reached a certain level of maturity [such that] **no major changes to radiological protection regulations … should be necessary"**

(Wrixon 2008, 161, 167; emphasis added)

- ICRP expects its 2009 publication "to lead to a **clear understanding and wide acceptance**" of its approach

(ICRP 2009, 98)

My Thesis

This optimism about the maturity of the ICRP system is premature

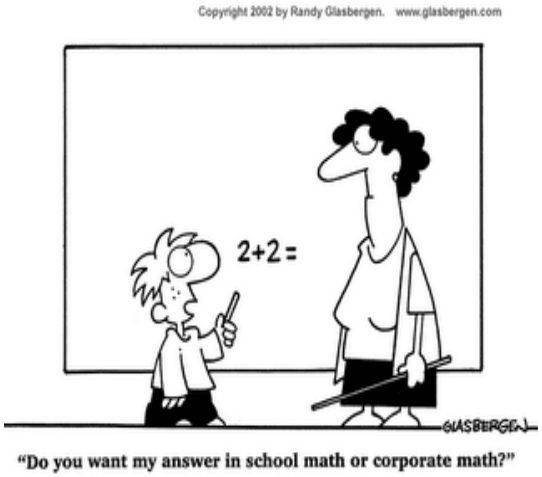
- Serious questions persist about how the current principles of nuclear ethics are formulated, understood and implemented.
- There are also major gaps.
- This situation leaves nuclear policy vulnerable to several standing threats that an ethical approach should seek to neutralize.

Part II

Standing Threats

(1) The Knowledge Asymmetry

- Scientific and technological aspects of nuclear energy are significant, pervasive and complex.
- Raises difficulties for anyone trying to make an ethical assessment, but the obstacles are more pronounced for outsiders than for insiders.



"Do you want my answer in school math or corporate math?"

Standing threat: *retreat* (even exit) of nonexperts, ceding policy to a technical elite.

Ethical problems:

- Justification (e.g., procedural justice)
- Selection effects (e.g., technological optimism, quantitative bias)
- Potential for distortion and corruption (e.g., regulatory capture)

(2) The Spatial Asymmetry

- Nuclear energy programs typically have different implications for individuals and populations depending on where they live and work.

Standing threat: policy decisions will have differential impacts that are manifestly unjust.

- Examples: environmental injustice, as classified by race, ethnicity and socio-economic status

(3) The Temporal Asymmetry

Temporal dispersion of costs and benefits

Characteristic threat: a tyranny of the contemporary

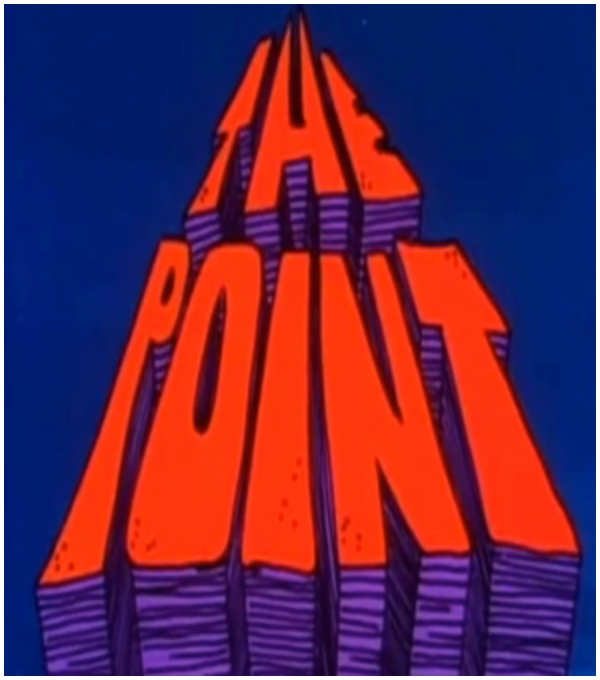
- generation-relative preferences
- front –loaded goods
- Iteration
- accumulation

Example: long-lived nuclear waste, genetic effects (e.g., Cranor 2014)

The Point …

A basic question of nuclear ethics is whether current regulatory policy is adequate to meet:

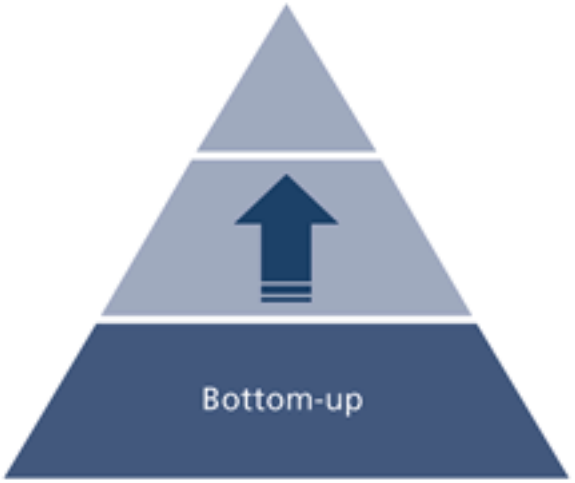
- the three asymmetries (knowledge, spatial, temporal) and
- their associated threats (retreat, environmental injustice, temporal buck-passing).



My Strategy

Pluralist, Bottom-Up Approach

- Consider existing ICRP principles in light of the standing threats
- Focus on how they have been (and might be) interpreted, and where there are significant gaps.
- Suggest fresh interpretations of existing principles, and a number of new principles.



Aim:

- NOT to deliver a robust new ethical framework
- but to reopen an important debate
- (others can offer more considered proposals to add to my modest additions and emendations)

A "Principled" Approach

Questions about Principles:

- Multiple roles (e.g., explain, justify, guide)
- Multiple forms (e.g., decisive, indicative, all-things-considered, relevant aspects)

My Principles:

- Aids to deliberation ("principles of moral salience")
- Modest status: aspects, not decisive, open ended evaluation
- Avoid partisanship: pluralism as a natural default position, lower-level of description (contrast with ICRP?)

Bottom-Up:

- Work from principles already in use in nuclear ethics
- Epistemic modesty: relevance gleaned from context
- Theoretical modesty: competing moral theories

Three Principles

Justification Principle (JP): No practice shall be adopted unless its introduction produces a positive net benefit.

Optimization Principle (OP): All exposures should be as low as reasonably achievable, economic and social factors being taken into account.

Dose Limit Principle (DLP): The doses to individuals shall not exceed the limits recommended for the appropriate circumstances by the Commission

First Impression: Pluralistic view that shows concern for net benefits, minimizing risk and individual protections

Question: How well do these principles address the asymmetries and standing threats just identified?

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Part III

Procedural Principles

Knowledge Asymmetry Revisited

- None of the three principles address this issue or the threat of retreat.
- Propose three new procedural principles of radiological protection (inclusiveness, accountability, publicity)
- Argue that they require reform of the ICRP system
- Claim that the publicity principle is especially significant and reveals a serious concern about past practices, and about the three principle system itself

(1) Inclusiveness

***Inclusiveness Principle*:**

- **Development, implementation, and enforcement of policies involving nuclear energy should be done by representatives of a diverse group of stakeholders and the wider public.**

Promoting inclusiveness involves explicit attempts to ensure broad participation in decision-making, especially by those heavily affected by a policy, and those historically under-represented or whose views tend to be marginalized (e.g., minorities, the poor, children).

Inclusiveness is a common strategy for addressing institutional biases in other areas.

- Epistemic reasons: inclusive deliberation and communities in science enhance knowledge production (Longino 1990, 2002; Lee and Schunn 2011)
- Ethical reasons: procedural justice, securing justification for regulative activities (Schlosberg 2007)

ICRP and Inclusiveness

- In recent years, the ICRP has showed some concern for increasing the size of the circle involved in deliberation on nuclear protection (e.g., since 2002 circulated draft proposals and allowed for public comment, in the wake of Fukishima supported the organization of a number of major regional conferences).

Nevertheless, it remains markedly exclusive when it comes to its own make-up.

- Specifically, the ICRP is (a) an independent group, that (b) selects its own members, (c) restricts membership to those of "scientific merit", and (d) explicitly rejects the idea of membership based on other grounds, including those based on representation "of any country, organization, or other entity" (Clarke and Valentin 2009, 27).

On the face of it, this approach is strikingly out of step with the principle of inclusiveness, and so requires justification. It suggests a strong burden of proof against the ICRP.

A Defense?

The Commission sees its approach as warranted in order to protect its "independence and scientific integrity" from "demands from special interest groups and other outsiders with vested interests", and from threats of "demands or covert criticisms aimed at gaining outside control of its membership and/or its policies"

(Clarke and Valentin 2009, 27).

"What's the opposite of 'Eureka!'?"

Some Replies

To some extent, these concerns are legitimate. However:

- Is such a rigidly exclusive policy really **necessary** to protect the integrity of the ICRP?
- Is the "internally-selected scientists only" policy **adequate** to protect the ICRP against threats of bias or special interests?
- Does the ICRP have **the right** to set itself up as a self-appointed authority on nuclear **ethics** without broader representation?

Note:

- Limited diversity among science disciplines and geographically in the current ICRP
- Though the ICRP is officially in the business of making value judgments and generating ethical principles, it excludes all nonscientists, including experts from other relevant disciplines (such as ethics and law), and representatives of affected populations and the wider public.

(2) Accountability

***Accountability Principle*:**

- **Those who develop, implement and enforce policies involving nuclear energy should be accountable to the wider public and especially those directly affected.**

Worries:

- ICRP stands outside standard mechanisms of accountability
- Though some organizations that use the ICRP recommendations are more accountable, it is not clear that this is a sufficient check
- In particular, the ICRP **provides moral and political cover** for such organizations through its ethical principles.

(3) Publicity

***Publicity Principle*:**

- **Those involved in the development, implementation, and enforcement of policies involving nuclear energy have a duty to make clear to the wider public (and especially those directly affected) the full scientific and ethical reasoning involved in justifying these activities in terms that are both accurate and accessible.**

ICRP does endorse an ideal of transparency

Going further:

- Explicit principle
- Publicity as a more robust ideal (e.g., active duty to engage, justified by knowledge asymmetry)
- Address the problematic history of the ICRP principles

…

Interim Conclusions

- The current ICRP principles are too limited in that they do not even consider procedural issues.
- The ICRP should consider (at least) principles of inclusiveness, accountability and publicity.
- These principles have significant implications for how the ICRP is constituted, and how it goes about its business.

Part IV

Collective Welfare Principles

Justification Principles

Justification Principle (JP): No practice shall be adopted unless its introduction produces a positive net benefit.

Traditional Interpretation:

- *Maximizing Benefit Principle (MBP)*: No practice shall be adopted unless its introduction produces the maximum net benefit.

- *Maximizing Cost-Benefit Principle (MCBP)*: No practice shall be adopted unless its introduction produces the maximum net benefit as understood through the methods of standard economic cost-benefit analysis.

More Natural Interpretations:

- *Net Benefit Principle (NBP)***:** No practice shall be adopted unless its introduction produces a positive net benefit.

- *Presumptive Net Benefit Principle:* No practice shall be adopted unless its introduction produces a positive net benefit, or *unless it furthers some other specified, and more ethically important, purpose*.

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The Traditional Interpretation

- *Maximizing Benefit Principle (MBP)*: No practice shall be adopted unless its introduction produces the **maximum net benefit**.

- *Maximizing Cost-Benefit Principle (MCBP)*: No practice shall be adopted unless its introduction produces the maximum net benefit **as understood through the methods of standard economic cost-benefit analysis**.

ICRP gloss:

- "cornerstone"
- utilitarian approach
- operationalized through the collective dose
- OP and DLP as derivative

"[a] classical use of cost-benefit analysis"

"**The principles of justification and optimisation aim at doing more good than harm** and at **maximizing the margin of good over harm for society as a whole**.

They therefore satisfy the **utilitarian principle of ethics**, whereby actions are judged by their overall consequences, usually by comparing in monetary terms the relevant benefits (e.g., statistical estimates of lives saved) obtained by a particular protective measure with the net cost of introducing that measure."

Issues for the Traditional Interpretation

Differences from the NBP: comparative, more demanding

Advantage: makes sense of 'justification' label

Disadvantages:

- monistic system of nuclear protection
- violates publicity
- utilitarianism is controversial
- CBA is controversial within utilitarianism
- neither direct utilitarianism nor CBA are structurally very sympathetic to distributive problems, such as the threat of environmental injustice
- indirect utilitarianism (the most popular philosophical form) would be more sympathetic, but then probably would not endorse the MBP (and may endorse sharp constraints instead)

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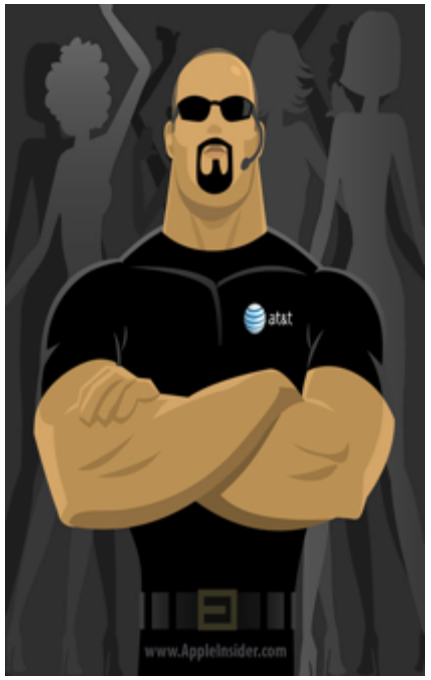
The Net Benefit Interpretation

- *Net Benefit Principle (NBP)*: No practice shall be adopted unless its introduction produces a positive net benefit.



Positive characteristics?

- Gatekeeper (side-constraint)
- Nontrivial (e.g., can protect against some environmental injustice)
- Leaves substantial room for other principles
- Respects publicity

Concerns:

- What metric?
- Too permissive? (e.g., high SDR, catastrophe baseline)
- Too restrictive? (e.g., compensating for injustice)
- Exclusively forward-looking
- Not clear whether even indirect utilitarianism would endorse it

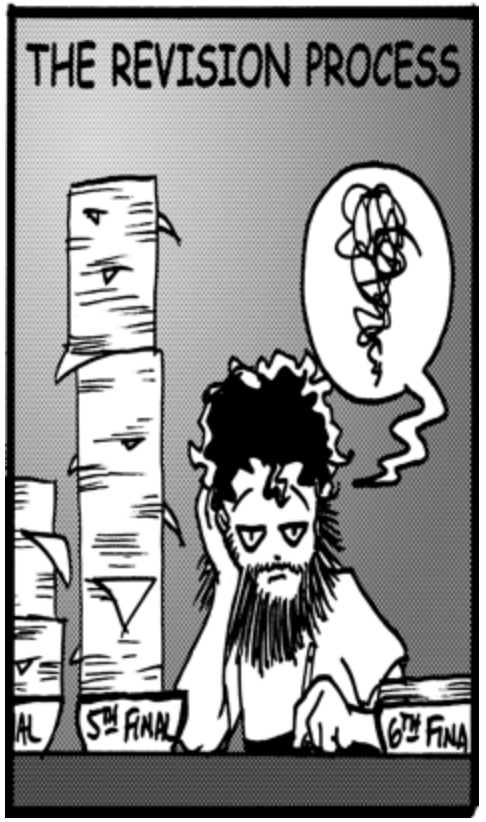
A Revised Net Benefit Principle?

Presumptive Net Benefit Principle (PNBP):

- No practice shall be adopted unless its introduction produces a positive net benefit, **or unless it furthers some other specified, and more ethically important, purpose**.

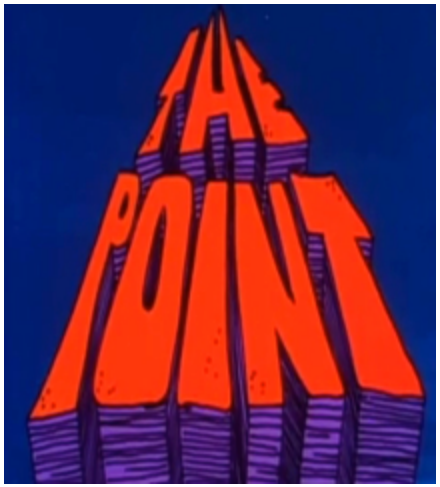
Attractions:

- Allows for other considerations, such as rights.
- More plausible as an indirect utilitarian principle than the MBP or the NBP
- Still imposes a burden of proof with respect to welfare on nuclear projects



Interim Conclusions

- The ICRP's Justification Principle is subject to multiple interpretations
- The traditional interpretation (MBP) is not the most natural, and violates the principle of publicity
- The connection between the traditional interpretation and utilitarianism is weak, and likely to be disputed by many philosophical utilitarians.
- The more modest side-constraint interpretation (NBP) also faces challenges, and perhaps should be supplanted by the even weaker PNBP.
- The protection provided by any of these principles against injustice (since they are collective) is likely to be weak



Part V

Minimization Principles

Optimization Principles

Optimization Principle (OP): All exposures should be as low as reasonably achievable, economic and social factors being taken into account.

- Suggestion of protection against some injustice?

"In practice, optimization is applied in a wide range of ways: from being seen as a frame of mind ("have I done all that I reasonably can?") and simple improvements of work processes, to complex decision-aiding methods, such as cost–benefit analysis." (Wikman-Svahn 2012, 260)

Optimizing Principles:

Optimal Balancing Principle (OBP): equivalent to the MBP

- Minimal protection against injustice
- Violates publicity

Exposure Minimization Principles:

- **Subordinate Minimization Principle** (SMP)
- **Necessity Principle (NP)**: Exposures are permissible only to the extent that they are necessary to achieve *sufficiently important social ends* that cannot be reasonably achieved in other ways.

The Necessity Principle

Necessity Principle (NP):

- **Exposures are permissible only to the extent that they are necessary to achieve sufficiently important social ends that cannot be reasonably achieved in other ways.**

Advantages:

- More faithful to the wording of the OP, where the focus there is not on the comparative benefits of the nuclear project, but on exposures themselves. It therefore suggests that exposures are special in a way that justifies a special burden of proof against them, and that this in turn justifies a minimization strategy.
- The most obvious reason for this would be if exposures are seen as a special kind of risk because of health and genetic effects.

Draconian, or Focusing the Discussion?

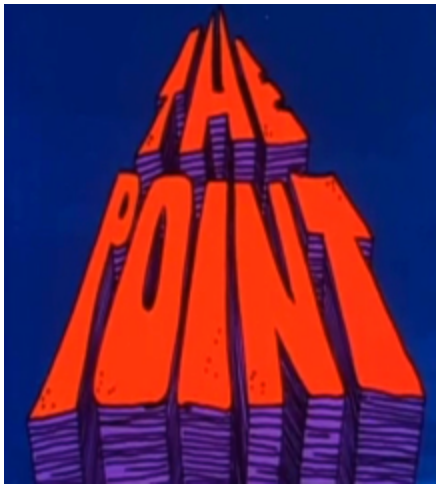
- In picking out the category of the "sufficiently important", the NP allows for consideration of the important ethical question of whether some goods (such as reducing the risk of cancer) are worth sacrificing purely for the sake of at least some kinds of other goods (e.g., luxury consumption goods).
- It does so without denying that some kinds of goods might satisfy this requirement (e.g., the alleviation of severe poverty, or catastrophic climate damages).

Advantages:

- By making the opportunity cost and special status claims clear in a principle, the necessity principle focuses discussion in a way that the existing ICRP principles do not.
- This is also helpful when it comes to satisfying the publicity principle. It helps the OP mean something that many would have initially taken it to mean, based on surface grammar and commonsense morality.

Interim Conclusions

- The ICRP's Optimization Principle is subject to multiple interpretations
- A core worry about this situation is that the principle ceases to become any kind of guide to decision-making, and especially the kind of guide that is useful in overcoming the standing threats of injustice.
- Some popular interpretations violate the principle of publicity
- Arguably, the most natural interpretation (the Necessity Principle) should be taken more seriously as a principle of nuclear ethics, and may help focus debate in the right way (e.g., when it comes to climate)



Part VI

Principles of Respect

(1) Individual Protection Principles

Dose Limit Principle (DLP): The doses to individuals shall not exceed the limits recommended for the appropriate circumstances by the Commission

Authority Principle (AP): the ICRP has the authority to set dose limits for individuals that nuclear projects should accept

Excessive Harm Principle (EHP): Individuals have a right not be exposed to an excessive level of harm, even if this could cause great problems for society at large.

No Harm Principle (NHP): Individuals have a right not to be exposed to harm.

Comparable Risk Principle (CRP): Individuals have a right not be exposed to a level of risk of harm from exposures that is not comparable with risks faced in other areas of life.

Natural Background Principle (NBP): Individuals have a right not be exposed to a level of exposure beyond those found in nature.

The Authority Principle

Dose Limit Principle (DLP): The doses to individuals shall not exceed the limits recommended for the appropriate circumstances by the Commission

Authority Principle (AP): the ICRP has the authority to set dose limits for individuals that nuclear projects should accept

Advantage: most natural reading

Disadvantages:

- Unclear what justifies the ICRP, as a self-appointed entity, in asserting its authority.
- Empty principle: AP reveals neither the rationale for limits, nor how they are to be determined. Instead, it is a placeholder for a real principle. (This is bizarre given that the DLP is supposed to be one of the three *foundational ethical principles* of nuclear policy.)

Excessive Harm Principle

***Excessive Harm Principle (EHP)*:**

- **Individuals have a right not be exposed to an excessive level of harm, even if this could cause great problems for society at large.**

"the principle of applying dose limits *aims to protect the rights of the individual not to be exposed to an excessive level of harm*, even if this could cause great problems for society at large", … the principle "therefore satisfies the deontological principle of ethics, also called 'duty ethics', proposed primarily by Immanuel Kant" (Clarke and Valentin 2009, 95)

Issue: what counts as "excessive harm"?

Various Harm Principles

No Harm Principle (NHP): Individuals have a right not to be exposed to harm.

- Rules out nuclear power, since any exposure increases risk.

Comparable Risk Principle (CRP): Individuals have a right not be exposed to a level of risk of harm from exposures that is not comparable with risks faced in other areas of life.

- Usually rejected because risks in other areas are hard to compare
- Sometimes seems inappropriate.

Natural Background Principle (NBP): Individuals have a right not be exposed to a level of exposure beyond those found in nature.

- Often rejected because it involves a naturalistic fallacy: an inference from what is the case to what ought to be the case

John Stuart Mill

Pragmatism?

Pragmatic Principle?

- Recent review: current ICRP recommendations employ "a multiattribute assessment of risks", but "the final choice seems to be based on pragmatic considerations" (Wikman-Svahn 2012, 261)

Disadvantages:

- Stands in tension with on the presentation of the principle as representing a Kantian approach that emphasizes "the *strictness* of moral limits" (CV 2009, 95)
- Violates publicity
- Not clear why the ICRP has the moral authority to *decide* that a pragmatic approach is warranted and then put forward *its own judgments* in this area

(2) Equity Principles

Dose Constraint:

"[the ALARA optimization] procedure should be constrained by restrictions on the doses to individuals (dose constraints), or on the risks to individuals in the case of potential exposures (risk constraints) so as to ***limit the inequity*** likely to result from the inherent economic and social judgements." (CV 2009, 97; emphasis added)

Problem:

- DC does not prevent some taking on risks for the sake of benefits that accrue solely or disproportionately to others.

Some suggestions for new principles:

- *Proportionality Principle (PP)*: Those exposed must be reasonably expected to receive at least a proportional benefit.

- *Special Representation Principle (SRP)*: Those disproportionately exposed are entitled to special consideration in the structuring of nuclear policy.

- *Vulnerability Principle (VP)*: Special consideration should be given to protect populations that are especially vulnerable to exposure.

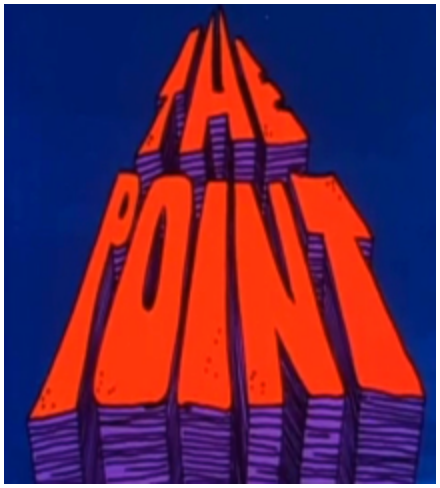
Interim Conclusions

- The ICRP's principles of respect (the DLP and the concept of the dose constraints) are radically underdetermined, and do not play the justificatory role intended.

- They seem ill-suited to the description of them as strict deontological principles, and so appear to violate the publicity principle

- Again, a core worry about this situation is that these principles cease to be any kind of guide to decision-making, and especially the kind of guide that is useful in overcoming the standing threats of injustice.

- The principles of proportionality, special representation and vulnerability may be stepping stones towards a better view of dose constraints



Part VII

Main Conclusions

(1) I rejected the view that the ethics of the existing international system of radiological protection has already reached "a level of maturity such that no major changes should be necessary".

(2) I proposed that a set of procedural principles is needed, and that these impose a significant burden of proof on the current ICRP arrangements.

(3) I argued that the publicity principle is violated by past interpretations and representations of the three main ICRP principles.

(4) I proposed new procedural principles (Inclusiveness, Accountability, Publicity), a collective welfare principle (Presumptive Net Benefit), an exposure minimization principle (Necessity), and four principles of respect (Excessive Harm, Proportionality, Special Representation, Vulnerability).

(5) Though all of these suggestions require much more robust elaboration and defense, I hope they serve the aim of reopening an important debate.