

ALARA: A Complex Approach Based on Multi-disciplinary Perspectives

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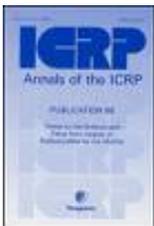
Based on a working paper co-
authored by Suman Rao

Outline

- **Introduction**
- **ALARA: a complex concept**
 - Philosophy dimension of ALARA
 - Justification and ALARA as policy principles
 - Risk Assessment and Management Dimension
 - Ethics and ALARA
 - Legal dimension of ALARA: from “soft law” to “hard law”
- **In Summary**
- **Recommendation**

Problem Statement

All aspects of optimization cannot be codified; optimization is more an obligation of means than of results. Except in cases of regulatory violation, it is not the role of the authority to focus on specific outcomes for a particular situation, but rather on processes, procedures, and judgments. ...The success of the optimization process will depend strongly on the quality of the dialogue



- Maintaining *status quo ante* will entail the following:
 - Imposition of criminal sanctions for non-adherence to general safety goals
 - Non-compliance with governance principles imposed by the European legal order
 - Intervention and assumption of competences by the European institutions in regulation of the nuclear sector (the problem of creeping competences)

Introduction

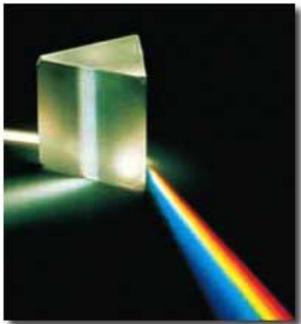
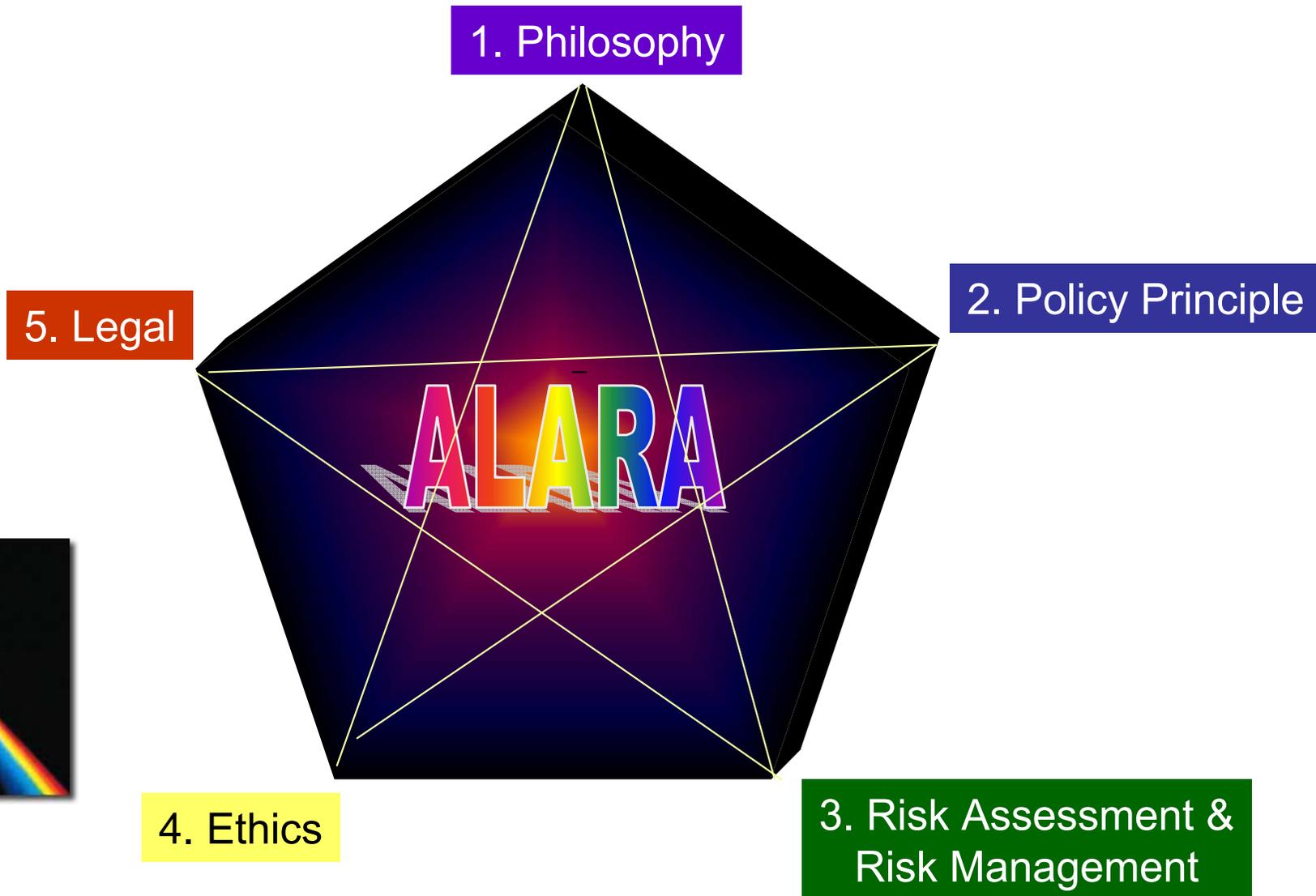
ALARA

- Situation gets compounded when multiple stakeholders are involved in the decision-making – different ‘LANGUAGES’
 - Sharing technical/PRA information with public
 - Regulatory mix of Justification, ALARA, dose limits and constraints
 - Individual exposure vs. collective dose



Is ALARA an Enigma?

ALARA: A Complex Concept



1. The Philosophy Dimension of ALARA



- Leibniz: Complete, have a calculus of limits leading to the “best” possible world



- Wittgenstein: clearly elucidated



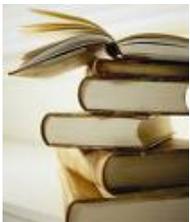
- Voltaire: reflexive

- Leibniz and Voltaire: benchmark with “best” practices

- Avoid “sophism”

2. Justification and ALARA as Policy Principles

Transparency



- Need for transparent policy principles
- Such policy principles can be formulated in soft law instruments (e.g. communications from the EU Commission)
- Implementation and control mechanisms have to be foreseen in order to make soft law effective
- Regulatory Impact Assessment needed

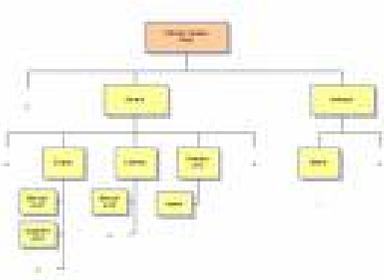
2. Justification and ALARA as Policy Principles

- Evolution towards risk-informed regulation required
- Urgent need for better standardization in order to provide security and certainty of law for operators and regulators

3. Risk Assessment and Management Dimension



- ALARA classified both as a tool for risk assessment and risk management –ICRP RM
 - Even within the domain of Radiation Risk Management interpretations are different e.g. HSE, ICRP, EPA
- No cross industry comparison is available



- In need of accountability for reasonableness
- At techno-managerial level ALARA conceptualized as a case-by-case application

4. Ethics and ALARA



- ICRP: an approach based on equity and fair distribution
- Utilitarian vs. deontological
- Kant: rules generally applicable
- RP decision-making: involve stakeholders and establish mechanisms to accommodate such involvement

4. Ethics and ALARA



- When and how will the “New Democracy” be applied in RP regulation?
 - open method of coordination (OMC)?
 - open dialogue?
- Suggest “accountability for reasonableness” in addition to transparency

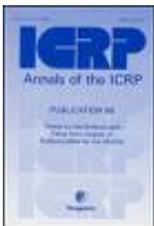
4. Ethics and ALARA



- As Justification principle intermingled with the optimization principle:
 - an open dialogue on benefits and measures is *sine qua non* for implementation of regulation
- New ICRP philosophy to be transposed in hard and soft law
- Right time for EU to apply the new governance mechanisms before outlining its policy principles

5. The Legal Dimension of ALARA From Soft Law to Hard Law...

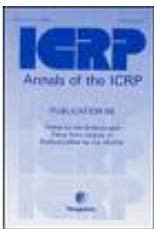
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- ALARA: a general principle of law?
 - Consequences of applying such a GLP leads to
 - Hindsight driven analysis and criticism of all exposures
 - More focused on the individual
 - On the other side of the legal spectrum
 - Risk for criminal sanctions

5. The Legal Dimension of ALARA From Soft Law to Hard Law...

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- ALARA: a general principle of law?
 - “except in cases of regulatory violation...”
 - ALARA is made mandatory in the operating license conditions
 - ALARA-EU directive-BSS
 - Not normative enough
 - Minefield for lawyers and judges who are forced to work in a combination of hard and soft law
 - Therefore ALARA as a GPL risks misunderstandings in implementation and compliance

5. The Legal Dimension of ALARA From Soft Law to Hard Law...

ALARA – Minimum criteria or Standard of Care?



- Difficult to implement and control ALARA regarding minimum standards
 - O'Connor Doctrine
 - Legal standard vs. Best Practices vs. Best Efforts
- Because of complexity of the ALARA concept, legal obligation of ALARA > always minimum requirement
 - Judges see “best efforts” or “execution in good faith” = discretion of the courts
 - Judges may use ALARA and arrive at inconsistent outcomes

5. The Legal Dimension of ALARA From Soft Law to Hard Law...

“There is no question that this (ALARA) provision mandates consideration of alternatives with respects to cost and environmental impact. However, there is equally no question in my mind that it does not go as far as to mandate that the alternative with the least environmental impact be selected. To do so would be to contrary to the scheme of the legislation...”

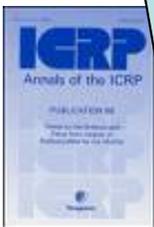


ALARA –Minimum criteria or Standard of Care?

- In the nuclear energy field ALARA embedded in a precautionary three-tier system of Justification, Optimization and dose limits
 - Dose limits less by a factor of 10
- Licensing authority should appreciate “residual risk” rather than “potential risk”?
- Case: Inverhuron & District Ratepayers' Association vs. Ontario Hydro
 - The ALARA principle too vague to create subjective rights and duties

5. The Legal Dimension of ALARA From Soft Law to Hard Law...

ALARA is a judgemental decision-making process based on quantitative and qualitative approaches to select the appropriate protection solution



- ALARA: minimum criteria or standard of care?
 - How are nuclear authorities appraising ALARA during licensing process, implementation and control?
- More procedural/management based regulation necessary
- ALARA: only a global RM tool without any legal consequence?
 - In the UK legal history: ALARA a RM tool used by courts to adjudicate “duty of care”

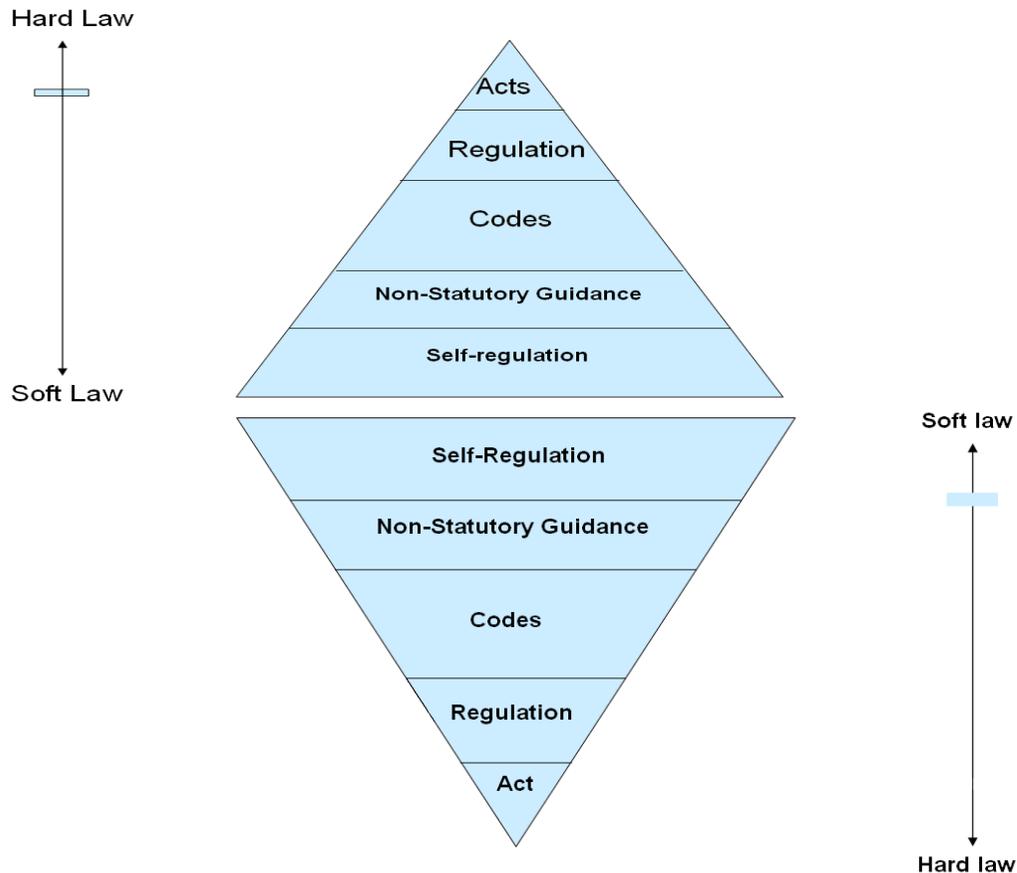
5. The Legal Dimension of ALARA From Soft Law to Hard Law...



ALARA and tests of reasonableness:

- Evolution of “reasonable practicality” (U.K)
- ALARA and TOR policy model
- Common law provisions vs. RM provisions-
linkages unclear
- Based on the evolution of ALARP and
“reasonable” in U.K
 - Common law vs. civil law traditions

5. The Legal Dimension of ALARA From Soft Law to Hard Law...



- Classical format
 - Acts/regulation at the apex of the regulatory regime
 - Self-regulation at the bottom of the regulatory regime
- Current nuclear format
 - Self-regulation at the apex of the of the regulatory regime
 - Regulation at the bottom of the of the regulatory regime
 - Most Justification and ALARA processes left to the industry

What is needed to compensate for this inversion?

 - Benchmarking/feedback from 'best practices must be integrated in the law-making process'

5. The Legal Dimension of ALARA From Soft Law to Hard Law...



- **ALARA –A Code of Practice?**
 - Consequences of Failure to observe code of practice ?
 - Civil/criminal liability
 - Burden of proof shifting to operators
- **Nuclear industry should give binding process standards “arms and legs”**
 - compliance can be checked by the authority giving the operators the necessary security of law, especially when also the enforcement policy is being published under legislative power
- **Such “checks and balances” can be derived from years of practice of IAEA, OECD/NEA and WENRA**
 - in such a way that the existing codes of practice (e.g. the safety case under Common law) are linked to the Acts and the regulation, which establish the norm addressees and the legal consequences clear and precise

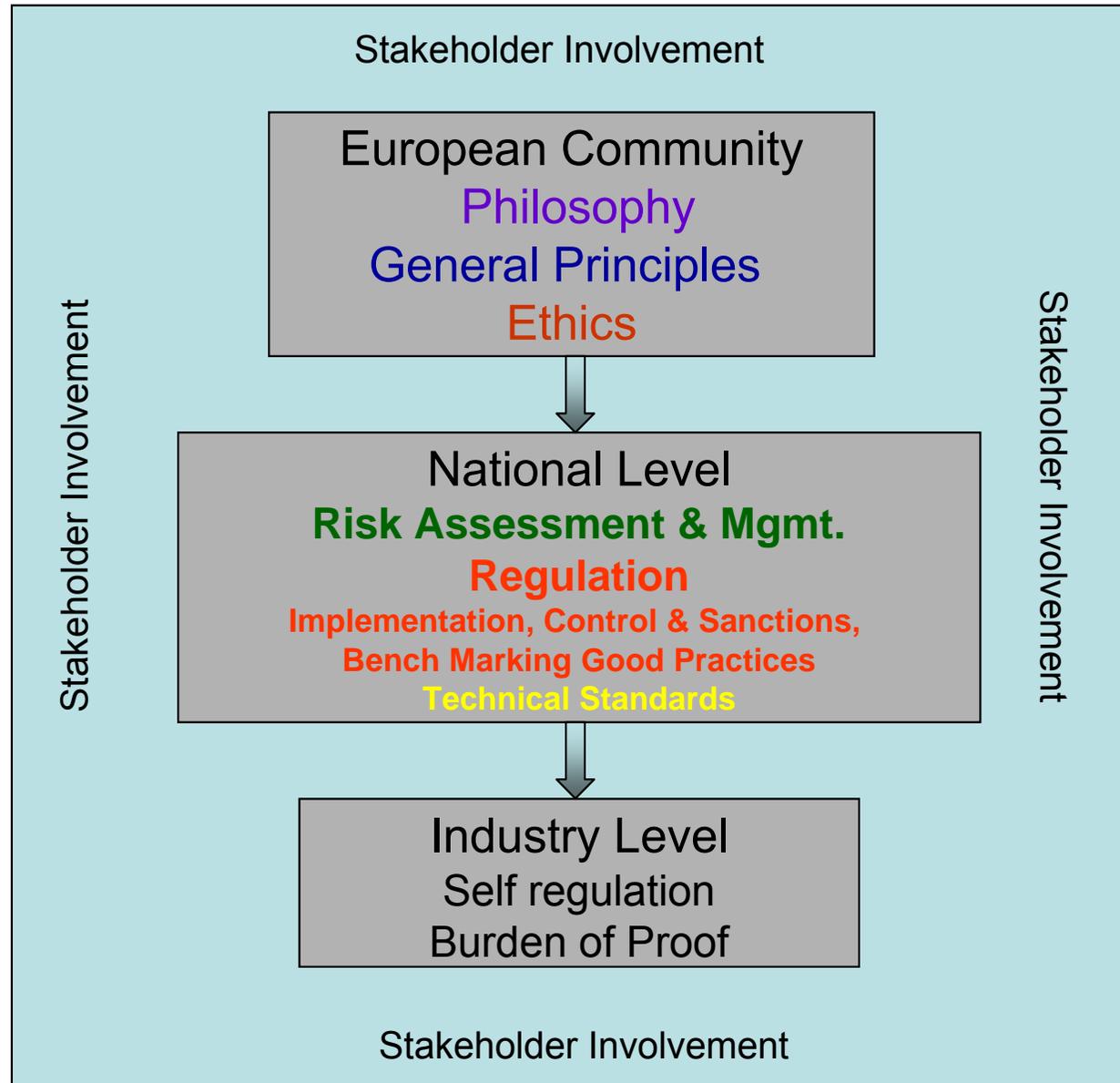
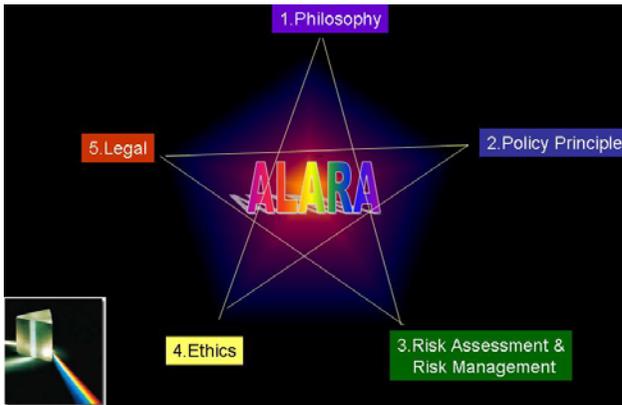
In summary...

- **Given its complexity, leaving the application of ALARA as it stands today,**
 - is not philosophically sound (impossible to define "reasonable"),
 - politically not strategic and transparent,
 - technically not uniform and decision-streamlined,
 - ethically not democratic and expert-driven,
 - give rise to risky outcomes both for the potential victims and for the nuclear industry,
 - and finally from the legal side would be impossible to implement and monitor.

Recommendations

- Learning from international research and existing models for “good governance” and regulatory accountability
 - Measure-oriented guidelines and standardized methods for adequate risk assessments
 - Role of indicators
 - Technology based regulation (BAT) after benchmarking of designs and practices
- Step-up from soft law to hard law: use of “shall” and “should”
- A “complex” conceptualization of ALARA is need of the hour

Recommendations



Questions and Debate