5th Science and Value NEA Workshop

Overview of Ethical Challenges in Occupational Exposure

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Summary

• Many good and useful topics, approaches and challenges discussed at previous workshops, difficult to reduce to a 30 min general overview presentation...

• There seems however to be an area of occupational exposure where further looking into value aspects may still be useful: when exposure occurs in a professional environment not accustomed or prepared to deal with radiation issues

• A few real life examples to illustrate the issues at hand

• Some lessons learnt in the field, and may be some conclusions to draw and discuss at this workshop
Un-planned and/or unforeseen occupational exposure scenarios?

• Accidental irruption of an external source of radioactivity at the workplace (i.e. a source unrelated to, but influencing production processes)

• Confronting a radiation hazard which, although suddenly expected due to specific circumstances, has not occurred before

• A common challenge: how to bridge the wide culture gap between radiation specialists/authorities and the professionals involved, both employers and workers
Some real life examples

• A cobalt contaminated consignment of steel enters, un-noticed at first, into the production line of lift components

• Post Fukushima accident, some professionals in France were confronted to a potential contamination of their production processes, sparking employer/employee debate on the acceptability of radiation risk, with radiation experts in the middle

• In Japan, also post Fukushima, farm workers were permitted to return in some of the contaminated areas, only for professional purposes.
Examples and actions taken

• Contaminated lift component production
• Custom officers inspecting cargoes off ships navigating from Japan after Fukushima
• Maintenance (in France) of turbines from helicopters having flown tsunami rescue missions in the Fukushima prefecture
• Repairing telecom under-sea cables off the coast of Fukushima, an urgent task for the French operator a few days after severe damage from the Tohoku seism
• French journalists lightly contaminated during their mission near Fukushima
• Professional exposure in Japan farmland in Fukushima prefecture
Lessons learnt 1

1. Dose envelope theoretical calculations, based on maximum exposure scenarios, even leading to very low dose levels (<1msv), may be insufficient to allow the confidence to return at the workplace.

2. However, the deployment of physical measurements at the workplace, defined and operated by experts in the presence of workers/employers, and leading to realistic dose estimates, proves to be a successful approach, gradually developing a capacity to understand, discuss and de facto apply the concepts of justification / tolerability.
3. In such situations, a realistic estimation of exposures, based on measurements when possible, is more appropriate to risk-informed decision making, taking into account other hazards and socio-economic aspects. This is different from the approach often followed when assessing a radiation protection prevention plan, and experts may hesitate...

4. workers, even most unfamiliar with radiation issues, can rapidly become their own exposure optimisation managers if they are trusted and equipped with adequate instruments...
Some « values » based topics for further discussion? (1)

1. Radiation protection experts rarely explicit uncertainties in the expression of their dose estimates, which are presented as precaution based envelopes. This practice may be detrimental in situations, outside the sphere of traditional radiologically exposed professions, where:
   - Several hazards should be taken into account
   - Difficult discussion on justification lays ahead
   - Significant societal and economic consequences may be in play
Some « values » based topics for further discussion? (2)

2. Radiation protection experts/authorities may be unprepared to deal with such situations, in terms of risk communication skills, and in terms of their specific technical intervention process, which may prove inadapted (different from both public exposure and « nuclear » occupational exposure). There does not appear to be a lot of existing guidance for such situations, which are rare but may occur anywhere at any moment, even outside the context of a « radiological accident ». 
Some « value » based topics for further discussion? (3)

3. In workplaces not normally exposed to radiation risks, where no RP culture or expertise exists, workers/employers can, when confronted to radiation, quickly become effective agents of their own protection. They only need to be encouraged, and given some expert support and adequate equipment. This tends to contradict the belief that such professionals can only be passive actors waiting to follow instructions.

4. In such unchartered situations, leadership for radiological safety is an essential asset for RP experts, to steer action effectively by mobilising RP underlying values

Here also guidance might be valuable?
Conclusions
Several issues of values based discussion for applying RP principles in unforeseen occupational exposure situations:

– **Justification / tolerability of risk:**
  - Over-conservative dose estimates may be detrimental to an all hazards ALARA optimum
  - Physical measurements at the workplace tend to facilitate dialogue between stakeholders, extrapolating existing risk management culture

– **Optimisation of exposures:**
  - The explicitation of dose uncertainties can facilitate the discussion between concerned parties on the way forward
  - Enabling workers (instruments, basic understanding of dose accumulation process, using existing risk culture) can be effective

– **Regulatory limits**
  - Lack of clarity of existing frameworks (ICRP, BSS) can be detrimental
  - The legitimacy of the occupational RP framework is not necessarily well accepted in such situations, and this can lead to conflict

– **Leadership capability of RP experts is essential in such cases**
THANK YOU FOR YOUR ATTENTION