

NuSAC Paper

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## NUCLEAR SAFETY ADVISORY COMMITTEE

### Impact of the 2007 ICRP Recommendations on Nuclear Safety

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on behalf of Task Force 4

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#### Overview and Key Messages

1. The new 2007 ICRP General Recommendations are evolutionary in character and present no reasons for any significant change in the regulation of nuclear and radiological safety. It is however inevitable that the existence of the new recommendations will provide a trigger for the revision of both the IAEA and the EU Basic Safety Standards, and indeed such work is already in progress. Some of this proposed change may be reasonable and helpful, although some may add no value at all in terms of improvements to real safety. HSC/HSE should seek to ensure that any changes which would require amendment to the UK regulatory system are fully justified by real benefits to safety.

#### The Context of the ICRP Recommendations

2. ICRP reviews and re-issues its General Recommendations on radiation protection from time to time. Both the IAEA Basic Safety Standards (BSS) and the Euratom BSS Directive are required to take the ICRP recommendations into account, and the Health Protection Agency are required to advise the UK Government on their application. The previous General Recommendations (ICRP Publication 90) were issued in 1990 and eventually led to the Ionising Radiations Regulations 1999. ICRP have just issued revised recommendations as Publication 103.

#### Impact of the 2007 ICRP Recommendations on Nuclear Safety

3. There is little directly flowing from the 2007 ICRP Recommendations which would impact to any significant extent on nuclear safety or the regulation thereof in the UK;

4. ICRP introduce revised terminology and categorise exposure situations as Planned, Existing and Emergency. This terminology is largely intended to replace the well-recognised 'practice and intervention' approach. This difference has no direct regulatory impact for nuclear safety;
5. There are no changes in dose limits. Because of recommended changes to tissue weighting factors there will be changes to dose per unit intake (DPUI) factors necessary in due course. These require further work at the international level, which is expected to take several years but should not be controversial or have a significant impact;
6. The importance of optimisation (ALARA) as the cornerstone of practical radiation protection remains, and indeed is strengthened. This broad area is supported by the recognition of the importance of safety culture and the visible and active leadership of senior management. This therefore reinforces NuSAC's safety culture workstream;
7. It is noted that after assessing all the evidence relating to genetic effects, the impact of pre-conception exposure to radiation has been given a reduced risk factor compared to previous assessments. This is helpful confirmation in the context of the specific UK debate regarding the incidence of childhood leukaemia around nuclear sites – ie there is no support whatsoever for what became known as the 'Gardner hypothesis'. NuSAC notes that the underpinning science on this topic continues to develop and is kept under review by COMARE;
8. ICRP mention the evidence from the Hiroshima and Nagasaki populations about non-cancer radiation effects (eg heart disease, stroke, digestive disorders, respiratory disease). It states that there are many uncertainties about the dose response relationship for such effects at low doses and it is not appropriate to take them into account at present;
9. For emergency situations ICRP have chosen to introduce 'reference levels' which should be used to constrain optimisation of protection in the response to an accident. They have also acknowledged some changes in the framework for considering the rehabilitation stage after an emergency – ie moving from an emergency exposure regime to an existing exposure regime at an appropriate time. Whilst there is an interim view that neither of these changes is likely to impact significantly on current UK emergency arrangements, it is noted that further work is continuing within ICRP to prepare further guidance. UK bodies concerned with these issues (such as HPA and NEPLG) will wish to consider the implications as more information becomes available, and NuSAC should monitor developments through Review Group 4;
10. The concepts of exemption and exclusion are clarified in the 2007 Recommendations and in a further report (ICRP Publication 104). These concepts are already being used in Defra work to revise the definitions of

'radioactive material' and 'radioactive waste' in the Radioactive Substances Act and in the revision of the Exemption Orders made under the Act.<sup>1</sup> NuSAC should continue to take an interest in this work because of the potential impact on waste management on nuclear sites, particularly during decommissioning;

11. For the first time the 2007 Recommendations contain a section on protection of organisms other than humans. The section serves to indicate the importance that ICRP devotes to the topic but contains little that is useful for regulatory purposes. There is a further ICRP report in preparation that is expected to provide more practical guidance. This topic is primarily of relevance to the environmental regulators.

### **Possible Impact on the EU Basic Safety Standards Directive**

12. The broad conclusion of the direct impact of the new recommendations is that there is no driver to amend any UK regulations. However, it is clear that the very existence of the new ICRP recommendations has provided one trigger (amongst others) for work in both IAEA and the EU regarding the updating of their respective BSS. In both cases this will result in the temptation and opportunity to include a wider range of issues in the change process.
13. The EU BSS Directive is of course mandatory in the UK, and it seems inevitable that over the next few years this will necessitate the updating of some UK legislation. At this stage it seems that the following issues are 'in the sights' of the EU revision process:
  - Consolidation of other Directives eg Outside Workers, HASS, Medical Exposures, REPIR
  - A more harmonised approach to exemption/clearance across the EU.
  - A more harmonised approach to emergency planning across the EU.
  - A more harmonised approach to 'graded regulation' across the EU.
14. Some of these issues could necessitate substantial changes to UK legislation. At this stage the possible consequences for UK legislation are unclear. It seems inevitable in this process that minor changes resulting from the new ICRP recommendations (eg incorporating new ICRP terminology such as the types of exposure situations – planned, emergency and existing) will be brought into the Directive, and hence potentially require some change to UK legislation.

### **NuSAC Recommendations to HSE**

15. The NuSAC recommendation to HSE is to make no changes to regulations, guidance or regulatory practice at present in order to take account of the 2007 ICRP Recommendations.

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<sup>1</sup> Further information can be provided to NuSAC on this topic if required, or see Defra website.

16. It is also recommended that HSE and others involved in negotiating changes to the EU BSS Directive develop clear criteria for acceptance of proposed changes which could impact on UK legislation. Such criteria could include:
- improvements in real levels of radiological protection of humans and other organisms which outweigh the additional burden of compliance
  - reduction in the regulatory burden
  - more transparency in legislation and regulation
  - facilitating further changes in the light of better knowledge of the health effects of radiation on people and other organisms
  - bring real demonstrable benefits to the practical implementation of protection through the harmonisation of approach across Europe.
17. A similar approach should be applied to UK involvement in the revision of the IAEA BSS.
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