



25 October 2019

**Re: ARPANSA comments on ICRP draft document “Radiological Protection of People and the Environment in the Event of a Large Nuclear Accident”**

Dear Authors,

Thank you for the opportunity to comment on the above-mentioned document, as available on the ICRP website. The response within this letter is the consolidated view of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). General comments have been incorporated below, with specific comments on particular passages (including typographical errors) provided in the attached table.

Overall, the document is well-written and a useful addition to the ICRP’s suite of documents. The treatment of the phases of the emergency situation is broadly consistent with that applied internationally (e.g. by the IAEA) and nationally in Australia (in the [Guide for Radiation Protection in Emergency Exposure Situations](#), Radiation Protection Series G-3, 2019). Particularly useful information is provided on the implementation of protective actions and the protection of workers in emergency response and remediation activities.

ARPANSA is supportive of the protection of the environment in all exposure situations. The approach to protection of the environment presented in this document during the emergency and through the remediation (existing exposure) is a practical application of the ICRP’s environmental protection framework.

One area where ARPANSA would like to raise concern is in relation to the “ $\leq 10\text{mSv}$ ” value presented for an existing exposure situation in Table 6.1, and the statement that “The long-term goal is to reduce exposures to the order of  $1\text{mSv}$  per year”. This is much more restrictive than the statement on page 288 of ICRP 103 (viz. “In most existing exposure situations, there is a desire from the exposed individual, as well as from the authorities, to reduce exposures to levels that are close to or similar to situations considered as ‘normal’.”), and it should not be the expectation for all environmental dispersion-type accidents that this level of dose is justified, or even possible, to be achieved. A more practical recommendation is that the principles of justification and optimization are be applied within the 1–20mSv range to define the reference level, noting that this applies to the most affected groups, indicating that most of the population will receive lower doses than the value applied (see Paragraph 168). Further, it is noted and appreciated that [ARPANSA’s Guide for Radiation Protection in Existing Exposure Situations](#) (Radiation Protection Series G-2, 2017) is referenced within the document with regard to the setting of such a reference level.

If you require any further clarifications or have questions about these comments please do not hesitate to contact me at [Marcus.Grzechnik@arpansa.gov.au](mailto:Marcus.Grzechnik@arpansa.gov.au).

Kind regards,



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**Attachment: ARPANSA’s Specific Comments on ICRP draft document “Radiological Protection of People and the Environment in the Event of a Large Nuclear Accident” (ICRP Ref:4820-5028-4698).**

<i>Location</i>	<i>Comment</i>	<i>Suggestion</i>
General	<p>ARPANSA supports the following aspects of this draft document;</p> <ul style="list-style-type: none"> <li>• Reference to optimisation and justification in the setting of the reference level at various stages of the emergency and remediation,</li> <li>• The treatment of emergency phases,</li> <li>• The pragmatic approach to protection of the environment in various exposure situations,</li> <li>• The approach to protection of workers during an emergency and the treatment of their dose limit for subsequent activities in planned exposure situations.</li> </ul>	-
General	<p>ARPANSA has concerns with the generalisation for remediation that “The long-term goal is to reduce exposures to the order of 1mSv per year”. It is felt that this is not in line with optimization and justification of the reference level. Additionally, if this value of 1mSv refers to the reference level, then it applies to the most exposed parts of population, making it an extremely restrictive criteria.</p>	<p>Adjustment of the language used, to include justification (additions in red):</p> <p>“Where justified, the long-term goal is to reduce the majority of exposures to the order of 1mSv per year”.</p>
Section 2.3.3, Para 75	<p>The term “selected reference level” is used initially, and is then substituted for “reference value”.</p> <p>“Reference Value” does not appear in the Glossary.</p>	<p>It is suggested to remove the term “Reference Value” from the document, instead using previously established descriptors.</p>
Line 828	<p>Typographical: Extra ‘dash’ in “1–20-mSv”.</p>	<p>Remove dash.</p>
Para 80	<p>“For people living in long-term contaminated areas following the emergency response, the Commission recommends that the reference level should be selected within or below the Commission’s recommended 1-20mSv band taking into account the actual distribution of doses in the population and the tolerability of risk for the long-lasting existing exposure situations, and would not generally need to exceed 10 mSv per year, with the objective to reduce exposure progressively to levels on the order of 1 mSv per year.”</p>	<p>Consider including the principle of justification, viz (additions in red):</p> <p>“For people living in long-term contaminated areas following the emergency response, the Commission recommends that the reference level should be selected within or below the</p>

	<p>See above General comment.</p> <p>This statement suggests that justification of the reference level should be applied, but does not explicitly state it.</p> <p>The values and words provided in Table 6.1 do not allow for justification and optimization, as implied in the above statement.</p>	<p>Commission’s recommended 1-20mSv band taking into account the actual distribution of doses in the population and the tolerability of risk for the long-lasting existing exposure situations, and would not generally need to exceed 10 mSv per year, with the objective, <b>where justified</b>, to reduce <b>the majority of exposures</b> progressively to levels on the order of 1 mSv per year.”</p>
Para 81	<p>“The Commission recommends that some types of protective actions should be maintained during the recovery process as long as a significant proportion of the affected population receive exposures above 1 mSv per year...”</p> <p>The principle of justification should be introduced to this statement.</p>	<p>Suggest the additions in <b>red</b>;</p> <p>“The Commission recommends that, <b>where justified</b>, some types of protective actions should be maintained during the recovery process as long as a significant proportion of the affected population receive exposures above 1 mSv per year...”</p>
Para 83	<p>The term “Environmental Reference Value” is used twice in the paragraph, but is not defined in the paragraph or the Glossary.</p> <p>The description used in ARPANSA’s Radiation Protection Series G-1, Guide for <a href="#">Radiation Protection of the Environment</a> (2015) is as follows;</p> <p>“The DCRLs identify a band of dose rates where a decision-maker may need to consider the potential for deleterious effects of radiation in a particular species, although further considerations might be needed in order to take a fully informed decision. Where the reference organism is sufficiently similar to one of the RAPs, the corresponding DCRL for that RAP could be used as the environmental reference value; in other cases other values (such as those discussed by IAEA or UNSCEAR, see</p>	<p>Provide a Glossary definition of the term “Environmental Reference Value”.</p> <p>For suggested wording, see an equivalent term which is defined in the Glossary of Radiation Protection Series G-1 (2015) as:</p> <p><b>environmental reference level (ERL)</b></p> <p>Dose rates to wildlife at which a more considered evaluation of the situation</p>

	<p>Table 1) would be appropriate. The rationale for the selection of ERL should be clearly documented in the assessment report.”</p> <p>In this case the terms ERL (Environmental Reference Level) and Environmental Reference Value are used interchangeably.</p>	<p>should be considered. The ERLs should be derived from knowledge of biological effects in wildlife (e.g. DCRLs (q.v.)), and their relationship to dose rate</p>
Para 84	<p>Emergencies do not always result in high exposures.</p>	<p>Suggest the additions in red;</p> <p>“Emergency exposure situations arising from large nuclear accidents <b>may</b> result in exposure of on-site personnel...”</p>
Para 87	<p>Radiation exposures increase risk rather than cause risk.</p>	<p>Suggest the substitution shown in red;</p> <p>“... and will generally also prevent or significantly reduce radiation exposures that would <b>cause increase</b> risks of cancer...”</p>
Para 95	<p>Grammar: Use ‘onto’ rather than ‘on to’.</p>	<p>Suggest the substitution shown in red;</p> <p>“... deposition of radioactive material directly <del>on to</del> <b>onto</b> the sea...”</p>
Para 100	<p>Assumption is made that the stakeholders “will want” to map their radiological situation. This may not be true for all people.</p>	<p>Suggest the substitution shown in red;</p> <p>“... affected stakeholders <del>will want</del> <b>may wish</b> to map their own radiological situation...”</p>
Para 160	<p>Typographical: replace ‘decision’ with ‘decisions’</p>	<p>“Such <del>decision</del> <b>s</b> should be...”</p>
Para 164	<p>Grammatical.</p>	<p>Suggest the addition in red;</p> <p>“● Responsibilities of the authorities responsible for managing the emergency response have been transferred to <b>the</b> local level.”</p>

<p>Para 196 &amp; Section 4.2</p>	<p>Non-emergency workers after the emergency seem to be protected through the use of a reference level – the exposure situation for these workers is not stated.</p> <p>After the emergency situation is terminated, because the workplace situation is able to be characterised and controlled with confidence, workers in remediation or other occupations (<u>not</u> responders) should be treated in the same way as workers in a planned exposure situation, where a dose limit is applied.</p>	<p>Suggest explicit statement that these workers are protected according to a planned exposure situation.</p>
<p>Para 221</p>	<p>Typographical: Incorrect reference provided.</p>	<p>This sentence is referring to GSR Part 7.</p> <p>Replace “IAEA, 2015a” with “IAEA, 2015<b>b</b>”.</p>
<p>Table 6.1.</p>	<p>As above, there are several issues with this table for existing exposure situations.</p> <ul style="list-style-type: none"> <li>• The specification of <math>\leq 10</math> mSv per year is not consistent with the text of Para 80 (and the text proposed above). The wording of the footnote does not resolve this.</li> <li>• The wording “The long-term goal is to reduce exposures to the order of 1mSv per year” ignores the justification principle.</li> </ul>	<p>Reinstate 1-20 mSv per year range, with the footnote reflecting the text of Para 80.</p> <p>Adjustment of the language used, to include justification (additions in red):</p> <p>“<b>Where justified</b>, the long-term goal is to reduce <b>the majority of</b> exposures to the order of 1mSv per year”.</p>