

DS427 Assessment of Facilities and Activities for Protection of the Public and Protection of the Environment

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer:		Page. 1. of.10...					
Country/Organization:		Canada- CNSC Date: 23.5.2014					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Note: Suggested deletions indicated by bold red strike-through text. Proposed new or additional text are indicated in green bold text.							
1	1.11, p. 3	<p>The assessment for protection described in this Safety Guide is not intended to assess retrospectively the radiological impact from discharges during operations or the consequences resulting from an actual accident. Nevertheless, the prospective assessment of potential exposures could provide preliminary information to be used in:</p> <ul style="list-style-type: none"> • establishing the initial licensing basis with respect to the environmental envelope within which the facility is expected to operate; • designing the site-specific environmental monitoring program; and • assessing the hazards and the related consequences for the purpose of establishing adequate level of emergency preparedness and response [14]. 	<p>The prospective assessment can serve multiple purposes, in addition to that mentioned here related to emergency preparedness and response.</p> <p>The initial prospective assessment can also serve:</p> <ul style="list-style-type: none"> • As the initial licensing basis establishing the environmental envelope within which the facility is expected to operate; and • to inform the design of the site-specific environmental monitoring program 				
2	1.18, p. 4	The possible non-radiological impacts	Most nuclear facilities				

		of facilities and activities, such as the impacts on the environment from discharges of chemical hazardous substances and heated water and of the construction....	and activities will discharge mixed effluents. EIAs are generally conducted to consider all potential sources of impacts to the environment				
3	2.10, p. 6	<p>“the general intent of the measures taken for the purposes of environmental protection has been to protect ecosystems against radiation exposure that would have adverse consequences for populations of a species (as distinct from individual organisms)’.</p> <p>Exceptions are for species with a protected status (e.g. protected or threatened species) and their critical habitat.</p>	Clarifies the need to afford individual protection to representatives of protected species and their critical habitat as discussed later in the document (paragraph 5.53).				
4	4.12, P. 14	<p>Once the authorization or license has been granted or for facilities already in operation, a periodic safety assessment review will be required [29]; this could should include the review of the assessment of the facility or activity for protection of public and protection of the environment. The assessment should also be re-evaluated if there are significant changes in the source term, including in the total amount and the spectrum of radionuclides as well as changes in the bio-physical environment and land use around the site. The dashed lines in Figure 1 indicates where an assessment may be submitted if significant changes have occurred.</p>	<p>The periodic safety assessments should include a review of the assessment of the protection of the public and protection of the environment.</p> <p>This review provides the opportunity to test the adequacy of the prospective assessment (accuracy, conservatism, etc) in comparison to facility and environmental performance. It also provides the opportunity to refine the site-specific</p>				

			assessment using the accumulated facility and environmental monitoring data, and new science.				
5	4.13, p. 14	At the end of a decommissioning stage or before release of a site from regulatory control an assessment for protection is also expected. However, in this case, Source terms will differ from those during operations along with no releases and/or potential exposures. Thus, will differ from operational are involved and the methods and criteria could be different (for example, the estimation of the doses should be based mainly on environmental monitoring data and the dose criteria could be below dose limits and constraints used for operation).	Assessments completed for the end of decommissioning or prior to the release of a site from regulatory control may still involve assessing the transport of previously released radionuclides from various environmental abiotic and biotic compartments. While human exposure scenarios are likely to be extremely limited, non-human biota may still interact with radionuclides in environmental compartments such as the sediments. For the sake of transparency it may be necessary to demonstrate the acceptability of these residual exposures.				
5	4.20, p. 16	The communication of the results of the assessments of the level of protection of the public and the environment against routine discharges and potential	This is a value-laden statement. Radiation should not be specifically singled out here. Risk				

		<p>releases is equally as important and challenging as the completion of a technically sound environmental assessment. a difficult matter because radiological consequences of any kind are generally overstated due to the mechanism of risk perception of the public. It is important that essential information on radiation effects and the safety aspects related to design, operation, maintenance and surveillance of activities and facilities are included in the message produced to some of the interested parties, for example for the public.</p>	<p>communication is of key importance to any human health or environmental assessment not just those related to radiation. As many assessments will be addressing both nuclear and hazardous substances communicating issues such as relative risk, and perceived risk are extremely challenging. Even the most technically sound assessment can fail in its objective of supporting decision making if risk communication is not appropriately handled. The paragraph could be re-written to link to paragraph 4.19 with a focus on supporting “informed” public participation/involvement .</p>				
7	5.2, p. 17	<p>While the assessment of the level of protection of humans may in many instances is generally assumed to be sufficient to provide for protection of the environment, it is recommended that this be demonstrated by the completion of a radiological environmental risk assessment.</p>	<p>“The assessment of the level of protection of humans is generally <u>assumed</u> to be sufficient to provide for protection of the environment.” While many “assume” this, the completion of a radiological environmental assessment with respect to</p>				

			<p>non-human biota should be completed to demonstrate this.</p> <p>Many non-human biota have exposure pathways and life-cycle characteristics completely unique relative to humans.</p>				
8	5.2, p. 17	<p>.... the IAEA has developed a methodology to apply ICRP approach [32, 33] based on the concepts of ‘reference animals and plants’ for protection of different ecosystems in the environment. This methodology is consistent with similar methods developed and in use for various purposes by States. ‘Reference animals and plants’ is discussed below in the section on assessment of flora and fauna for normal operation. Various member states have also independently or cooperatively developed non-human biota dose assessment frameworks/models (insert references for RESRAD, ERICA, CSA N288.6). These alternative approaches have also been used to support decision making.</p>	<p>The range of relatively well developed modelling approaches, should receive specific reference in this document as they have all been scientifically and technically validated and used in EIAs in some countries to support decision making.</p>				
9	5.3, p. 17	<p>The models should be appropriate for the situation in which they are being applied, ensuring the assessment methodologies provide reasonable accuracy. Model assumptions and parameter choices should be sufficiently described and referenced</p>	<p>Transparency and independent verification are essential elements of credible EIAs.</p>				

		to be transparent and allow independent verification by the regulatory body, government agencies and stakeholders.					
10	5.4, p. 17	<p>Where possible, the results of the selected models should have been be supported through comparison of their results with data for similar exposure scenarios or, at least, by means of benchmarking procedures against other appropriate models. Section 1 also mentions the need for establishing environmental monitoring programmes for the operational phase of an activity or facility, not only to verify compliance with discharge and dose limits but to ensure that assumptions the conditions assumed in models were accurate or at a minimum conservative (i.e., over-protective) in nature. remain valid, and to-</p>	<p>Due to the developing nature of models for the estimation of radiological dose to non-human biota substantial simplification and in some situations a substantial level of conservatism is incorporated into existing approaches. To improve the adequacy of, and confidence in, these models, regulators and facilities should be encouraged to develop site-specific monitoring programs to test and aid in further model development.</p> <p>For example, the design and implementation of monitoring programs should be encouraged/required to test model predictions with respect to the transport and uptake of radionuclides within various abiotic and biotic compartments of the</p>				

			<p>receiving environment. Such efforts should focus on exposure pathways and species identified within the prospective environmental assessment as being the most significant transport and exposure pathways.</p> <p>General comment on the statement referring to monitoring: The need for monitoring programs may not be restricted to operational phases. As stated in Section 1.14 radiological monitoring or characterization is necessary to establish background and/or pre-project radiological characteristics. Radiological monitoring of releases and the receiving environment may also be necessary during the pre-operational commissioning phase(s) of a facility. Decommissioning activities and post-decommissioning conditions may also</p>				
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			necessitate radiological monitoring.				
11	5.8, p. 18	Facilities and activities extracting, processing and that use using of radioactive sources, including nuclear power plants , are designed, built, licensed, operated and maintained in order to prevent or control releases of radioactive materials to the environment. However, minor amounts of radionuclides can be found in some of the gaseous or liquid effluents resulting from the normal operations and, in accordance with the safety principles in [2] and the safety requirements in the BSS discussed in Section 3, there is a need to conduct assessments that include prospective estimations of the possible dose to members of the public.	<p>This section should be inclusive enough to capture the front-end of the nuclear fuel cycle, including mining and milling.</p> <p>In addition, even nuclear power plants cannot completely prevent their release of radionuclides.</p>				
12	5.21, p. 21	<p>5.21: When radionuclides are continuously discharged they accumulate in the environment up to the point where equilibrium conditions are or can be assumed to have been reached. The activity concentrations in the environmental media used to estimate doses should be representative of the conditions when accumulation can be assumed to have reached equilibrium.</p> <p>For example, when a when a facility is expected to be operational for 30 or 40 years, the dose should be assessed at the 30th or 40th year to take this accumulation into account Dose estimates should be calculated for the</p>	The time frame of the assessment should not be pre-constrained. Rather the time frame should be flexible to allow dose estimates at the time that highest exposures are expected.				

		time period at which the highest radiological exposure is expected.					
13	5.45, p. 26	See comment no. 3					
14	5.47 & 5.48, p. 26	See comment no. 7					
15	5.47, p. 26	Some States may consider that the assessment for protection to members of the public is sufficient to demonstrate protection of the environment.	Editorial				
16	5.79, p. 26	The paragraphs below only apply to situations where the explicitly assessment of the level of protection of flora and fauna is deemed necessary.	Editorial				
17	5.50, p. 26	ICRP has defined an approach to assess and control the effects of radiation on flora and fauna using the concepts of ‘reference animals and plants’, ‘representative organism’ - consistent with the concepts of ‘reference person’ and ‘representative person’ - and dose criteria in the form of ‘derived consideration reference levels’ [32]. These concepts and criteria are discussed below. Other methodologies developed and/or accepted by some member states are provided in the following references (provide appropriate references to ERICA, ResRAD, etc).	Relatively well developed options to the ICRP methodology should at least receive some acknowledgment and reference.				
18	5.61, p. 28	A generic assessment should use the types of animals and plants given for major ecosystems (terrestrial, freshwater and marine), which are relevant to the location being assessed. Specific care should be taken to	The assessment should also ensure that biota representing the most significant exposure pathway are included in				

		<p>ensure that biota representing the most significant exposure pathway are included in the assessment. Examples based on the ICRP methodology These are presented in Table 2 below.</p>	<p>the assessment.</p> <p>The ICRP reference animal and plants methodology may not be directly transferable or applicable to situations faced by many member states.</p>				
19	5.68, p. 30	<p>The derived consideration reference levels are presented in Table 2 above.</p> <p>Alternatives to the ICRP DCRLs are available from other jurisdictions (e.g. EU, USA, Canada).</p>	<p>Relatively well developed and validated assessment frameworks including radiation effects benchmarks are available from other jurisdictions and have been used by regulatory authorities for decision making.</p>				
20	5.70, p. 30	<p>The assessment may progress based on a number of factors from simple to complex using a tiered approach.</p> <p>If the dose rates to the representative organisms are below the lower boundary.....</p>	<p>Tiered assessment approaches are well developed with extensive guidance available from various jurisdictions (e.g. Australia, USA, Canada, EU countries).</p>				
21	5.84, p. 32	<p>Postulated severe accidents with large releases to the environment can have not only individual radiological consequences but may also cause psycho-social, economic,....</p>	<p>Studies following accidents such as Chernobyl and Fukushima and others have shown that psycho-social impacts may be significant, including post-traumatic stress syndrome.</p>				