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Mr. B. Torrie
Director General, Regulatory Policy Directorate
Canadian Nuclear Safety Commission
P.O. Box 1046
280 Slater Street
Ottawa, Ontario
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1.03.02
FILE
1-8-8-0
Torrie, B.

Dear Mr. Torrie:

Bruce Power comments on
draft REGDOC-2.5.5, Design of Industrial Radiography Installations

The purpose of this letter is to provide feedback on this draft Regulatory Document, which offers concise, well-written guidance on the design of industrial radiography installations.

As always, Bruce Power appreciates the CNSC's efforts to seek stakeholder input. Following a collaborative review of this draft with our industry peers at Ontario Power Generation, New Brunswick Power and Canadian Nuclear Laboratories, we found this document to be properly written at a guidance level and in a manner truly helpful to radiation protection experts. While pleased with the overall quality of this draft, which could serve as an example of how other Regulatory Documents should be written, our collective review did generate some suggestions and requests for clarification as detailed in Attachment A.

If you require further information or have any questions regarding this submission, please contact Mr. Maury Burton, Manager, Nuclear Regulatory Affairs, at (519)-361-2673 extension 15291, or maury.burton@brucepower.com.

Yours truly,

Frank Saunders
Vice President Nuclear Oversight and Regulatory Affairs
Bruce Power

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Attachment A

Bruce Power comments on draft REGDOC-2.5.5, Design of Industrial Radiography Installations

Bruce Power comments on draft REGDOC-2.5.5, Design of Industrial Radiography Installations

#	Document Section/ Excerpt of Section	Industry Issue	Suggested Change (*if applicable*)	Major Comment/ Request for Clarification[1]	Impact on industry if major comment
1.	**Preface and Glossary**	Radiography may be performed in locations that were not designed as radiography installations. These locations may have shielding (e.g. structural walls) even though they were not designed for the purpose of radiography. The document's scope should be more clearly defined and not so general as to include such locations. The definition used to describe a radiography installation is too general and inconsistent with current industry practice.	Define 'radiography installation' to exclude locations which are not specifically designed for radiography, by revising: - Preface, 3rd paragraph, 1st sentence, "A radiography installation.....cell or vault specifically designed for radiography, where...." - Glossary definition, **Radiography installation** A shielded enclosure....specifically designed for radiography, where..."	**Major**	Inclusion of locations not specifically designed for radiography imposes requirements for radiography type shielding for areas not designed for radiography.
2.	**Intro**	Not all CNSC regulatory requirements apply to uses of nuclear substances and radiation devices within a radiography installation.	Remove the last sentence of the 4th paragraph, which currently reads, "All CNSC regulatory requirements, including those specific to radiography, apply to all uses of nuclear substances and radiation devices within a radiography installation."	*Request for Clarification*	
3.	**2** General Design Principles	The following statement in the 3rd paragraph has not always been observed: "The design of a radiography installation should give preference to the use of engineered controls where ever possible, which are always functional."	Remove, "which are always functional" and replace with wording suggestive of high reliability.	**Major**	The statement may lead some licensees who have not experienced failure in the engineered controls (e.g. interlock not working as expected) to believe that engineered controls are fool proof, which is not the case.
4.	**2** General Design Principles	The 4th paragraph currently reads: "Engineered controls include: radiation exposure controls – distance, shielding, skyshine ..." Skyshine is an outcome of the level of shielding, not an engineered control. It is a component of exposure that can be managed or reduced via implementation of engineered controls.	Remove skyshine from list of engineered radiation exposure controls.	*Request for Clarification*	

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5.	**3.1.2** Shielding	The 3rd paragraph currently reads: "For any given nuclear substance, the relationship between radiation dose and the activity of the source is directly proportional . . ."	Suggest being specific about the proportional relationship by relating dose rate to activity. Dose is an inferred consequence.	*Request for Clarification*	
6.	**3.1.2** Shielding	Consistency needed relative to other references in the document with respect to high- and low-energy gamma.	Add "may" to 4th sentence of 1st paragraph to read "...radiography **may** emit high-energy gamma..."	*Request for Clarification*	
7.	**3.1.2** Shielding	The 1st sentence in the 2nd last paragraph (page 6) currently reads, "If the design does not or cannot provide enough shielding to meet the dose rate limit of 0.1 mSv/week or 0.5 mSv/year, as well as demonstrate ..."	Add the words "to non-NEWs" after 0.5 mSv/year. The sentence should then read: "If the design does not or cannot provide enough shielding to meet the dose rate limit of 0.1 mSv/week or 0.5 mSv/year to non-NEWs, as well as demonstrate ..."	**Major**	The document could be misinterpreted and overly restrictive beyond the existing regulations without the suggested addition. This regulatory requirement only applies to non-NEWs.
8.	**4.2** Restricting use of areas adjacent to the radiography installation	The 4th paragraph, 1st sentence reads, "All locations adjacent to the radiography installation should be clearly marked on a plan of the installation . . ."	Request clarification on what is meant by the plan (design layout, approval documentation, operating procedures).	*Request for Clarification*	
9.	**4.2** Restricting use of areas adjacent to the radiography installation	The 5th paragraph, 1st sentence reads, "Based on the exposure potential for areas adjacent to the radiography installation, the Certified Exposure Device Operator (CEDO) should monitor exposures in these areas to ensure that radiation doses are not exceeded." Clarification is needed to ensure implementation of radiation controls at radiography installations meets the regulatory requirements.	Clarification is required with respect to the design requirements for short-duration, high-field transients evaluated to be within the dose limits, but greater than the dose rate limits.	*Request for Clarification*	

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		The use of the term exposure appears to be intentional, in that it is recognized that as the source transitions from the shielded location to the collimator, the dose rates may be greater than the prescribed limits (0.1 mSv/h or 25μSv/h), even if the dose is well below the limits for non-news at those locations.			
10.	**4.2** Restricting use of areas adjacent to the radiography installation	The 1st sentence in the last paragraph of the section regarding exposure potential for areas adjacent to the radiography installation incorrectly refers to "radiation doses are not exceeded," and should refer to dose rate limits.	Change to: "...ensure that radiation dose rate limits are not exceeded."	*Request for Clarification*	
11.	**4.2.1** Adjusting the workload	Workload should be calculated using a conservative estimate of the maximum total exposure time, not necessarily the maximum time per shot x # of shots. Clarify that there are other appropriately conservative assumptions. Note – Appendix A uses the average time per shot (not max).	Add sentence to end of 2nd paragraph: "Other appropriately conservative assumptions can also be used. For example, Appendix A provides an example of dose calculations using the average time per shot."	*Request for Clarification*	
12.	**4.2.2** Controlling occupancy of surrounding areas	In 3rd paragraph, CEDOs should only be required to verify the occupancy of adjacent areas that will be impacted by the radiography. If radiography installation has sufficient shielding, adjacent areas will not be impacted and their occupancy does not need to be verified.	Add sentence to end of paragraph: "If radiography installation has sufficient shielding, adjacent areas will not be impacted and their occupancy does not need to be verified."	*Request for Clarification*	
13.	**4.3** Monitoring for human presence prior to exposures	Please clarify that the last paragraph is for radiography licensees to consult with applicable fire codes, and is not intended to add any additional requirements for a	Remove the phrase, "In all cases" from the paragraph.	*Request for Clarification*	

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		radiography installation.			
14.	**Glossary**	The definition of industrial radiography currently reads, "The use of certified exposure devices to conduct the non-destructive examination of the structure of welds, castings and building components. Also called gamma radiography." The definition is too restrictive. What if a radioactive source is used to do radiography of plants, samples or nuclear forensics items?	Suggestion is to make the definition broader so it matches the NSRDR's definition of an exposure device. Radiography should be broad enough to mean "taking pictures" and not specify the media with which the pictures are being taken. The radiographs can also be film or digital. Industrial radiography should only exclude medical purposes and should technically cover neutron radiography (because neutron radiography is used for industrial but non-medical purposes). A definition of industrial radiography that would work (for example is): "the use of an exposure device containing a nuclear substance to carry out non-destructive examination of items for industrial purposes; not used for medical diagnostic purposes; also called gamma radiography."	*Request for Clarification*	
15.	**Glossary**	The term "workload " is not defined	Add the definition for "workload" as it applies in this document	*Request for Clarification*	
16.	**Appendix A**	Provide consistent wording throughout to correctly define TVL. TVL reduces dose rate to 1/10 – not by 1/10	Change A.1, Step 4: Alter 5th paragraph, last sentence to read, "TVL1 is....reduce the dose rate to one tenth." Scenario 3 TVL2 definition to read, "is the thickness....dose rate to another one tenth."	*Request for Clarification*	