



2017 June 16

Mr. Brian Torrie
Director General
Regulatory Policy Directorate
Canadian Nuclear Safety Commission
280 Slater Street
P.O. Box 1046, Station B
Ottawa, Ontario, K1P 5S9

COMPLIANCE
Regulatory Affairs
145-CNNO-17-0021-L

Dear Mr. Torrie:

Canadian Nuclear Laboratories Comments on Draft REGDOC-2.5.5, Design of Industrial Radiography Installations

The Canadian Nuclear Laboratories has reviewed the draft REGDOC-2.5.5, Design of Industrial Radiography Installations, and has produced a set of consolidated comments, presented here as Attachment A. The industry partners represented in this review panel were: Bruce Power Limited Partnership, Canadian Nuclear Laboratories, New Brunswick Power Nuclear Corporation, and Ontario Power Generation.

Should you require further information or have any questions with regards to this submission, please contact me as indicated below.

Yours sincerely,

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SK/mj
Attachment (1)

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UNRESTRICTED

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Attachment A
Integrated Industry 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	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 scope of this document should not be so general as to include such locations. The scope of this document needs to be more clearly defined. The definition used to describe a radiography installation is too general and is not consistent with current industry practice.	Define “radiography installation” to exclude locations which are not specifically designed for radiography, by revising: - Preface, 3 rd paragraph, 1 st 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 Comment	Inclusion of locations not specifically designed for radiography imposes requirements for radiography type shielding for areas not designed for radiography.
2.	Intro – last sentence of 4 th paragraph	Not all CNSC regulatory requirements apply to uses of nuclear substances and radiation devices within a radiography installation.	Remove sentence “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	



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3.	Section 2 General Design Principles	<p>Fourth paragraph currently reads: “Engineered controls include: radiation exposure controls – distance, shielding, skyshine . . .”</p> <p>Skyshine is an outcome of the level of shielding, not an engineered control. Skyshine is a component of exposure that can be managed or reduced via implementation of engineered controls.</p>	Remove skyshine from list of engineered radiation exposure controls.	Request for Clarification	
4.	Section 2	The following statement 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 Comment	May lead some Licensees who have not experience 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.
5.	Section 3.1.2 shielding	Second or third paragraph currently reads: “For any given nuclear substance, the relationship between radiation dose and the activity of the source is directly proportional . . .”	Suggesting being specific about the proportional relationship by relating dose rate, to activity. Dose is an inferred consequence.	Request for Clarification	



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6.	3.1.2	Consistency needed relative to other references in the document with respect to high and low energy gamma.	Add “may” to 4 th sentence of paragraph to read “...radiography <u>may</u> emit high-energy gamma...”	Request for Clarification	
7.	Section 3.1.2 shielding	Ninth or tenth paragraph, first sentence 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 Comment	Document could be misinterpreted and overly restrictive beyond the existing regulations if the suggested addition is not made. This regulatory requirement only applies to non-NEWs.
8.	Section 4.2 Restricting use of areas adjacent to the radiography installation	Fourth paragraph, first 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.	Section 4.2 Restricting use of areas adjacent to the radiography installation	Fifth paragraph, first 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	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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		<p>that radiation doses are not exceeded.”</p> <p>Clarification from CNSC to licensees on these points is needed in order to ensure implementation of radiation controls at radiography installations meets the regulatory requirements.</p> <p>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 25 µSv/h), even if the dose is well below the limits for non-news at those locations.</p>			



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10.	4.2 last paragraph	First sentence regarding exposure potential for areas adjacent to the radiography installation, incorrectly refers to “radiation doses are not exceeded”, and should be corrected to reference dose rate limits.	Change to: “...ensure that radiation dose rate limits are not exceeded”.	Request for Clarification	
11.	4.2.1	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 2 nd 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 3 rd 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	



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13.	4.3 last paragraph	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 radiography installation.	Remove from the paragraph “In all cases”	Request for Clarification	
14.	Glossary	<p>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”</p> <p>The definition is too restrictive. What if a radioactive source is used to do radiography of plants, samples or nuclear forensics items?</p>	Suggestion is to make the definition broader so that it matches up with the NSRDR’s definition of an exposure device. Radiography should be broad enough to mean “taking pictures” and not specify the media that the pictures are being taken of. 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	Request for Clarification	



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			non-destructive examination of items for industrial purposes; not used for medical diagnostic purposes; also called gamma radiography.”		
15.	Glossary	The term “workload” is not defined.	Add to the glossary the definition for “Workload” as it applies to 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: - 5 th 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	