OPG 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, 3rd paragraph, 1st sentence, *"A radiography installation.....cell or vault specifically designed for radiography, where...."* - Glossary definition, ***"radiography installation*** *A shielded enclosure....cell or vault 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.	**Introduction – last sentence of 4th 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."*	*Clarification*	
3.	**Section 2, General Design Principles**	Fourth 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. Skyshine 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.	*Clarification*	
4.	**Section 2**	The following statement has not	Remove, *"which are always*	**Major**	May lead some Licensees who have not experience failure

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		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".*	*functional"*, and replace with wording suggestive of high reliability.		in the engineered controls, e.g. interlock not working as expected, to believe that engineered controls are foolproof, which is not the case.
5.	**Section 3.1.2, shielding**	Page 5, second 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.	*Clarification*	
6.	**Section 3.1.2**	Consistency needed relative to other references in the document with respect to high and low energy gamma.	Add "may" to 4th sentence of paragraph to read *"...radiography may emit high-energy gamma..."*	*Clarification*	
7.	**Section 3.1.2, shielding**	Page 6, third 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**	Document could be misinterpreted and could be 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 . . ."*	Please clarify on what is meant by the plan (design layout, approval documentation, operating procedures).	*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*	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.	*Clarification*	

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		ensure that radiation doses are not exceeded." 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. 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.	**Section 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".*	*Clarification*	
11.	**Section 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 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."*	*Clarification*	
12.	**Section 4.2.2,**	CEDOs should only be required to	Add sentence to end of paragraph:	*Clarification*	

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	3rd paragraph	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.	*"If radiography installation has sufficient shielding, adjacent areas will not be impacted and their occupancy does not need to be verified."*		
13.	**Section 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,"*	*Clarification*	
14.	**Glossary**	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? 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	Suggestion is to make the definition broader so that it matches up with the NSRDR's definition of an exposure device. 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."*	*Clarification*	

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		(because neutron radiography is used for industrial but non-medical purposes).			
15.	**Glossary**	The term "workload" is not defined.	Add the definition for "Workload" as it applies in this document to the glossary .	*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: - 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*".	*Clarification*	