

January 23, 2018

NK21-CORR-00531-14147  
NK29-CORR-00531-14834  
NK37-CORR-00531-02910

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

Dear Mr. Torrie:

Bruce Power Comments on DIS-17-01:  
Framework for Recovery in the Event of a Nuclear or Radiological Emergency

The purpose of this letter is to provide Bruce Power's comments on this Discussion Paper, which considers actions decision makers might consider prior to, or following, an emergency response. Answers to the specific questions posed in the paper are detailed in the attachment to this letter. Those responses stem from our own, internal company review and a collaborative evaluation with our industry colleagues.

Lessons from the Fukushima experience helped inform our responses, including the critical role government support agencies play in recovery operations. Given this, there is a need to clearly define the roles and responsibilities of these support agencies well in advance of any potential event. Similarly, the Fukushima event demonstrated the need for predefined reference levels for the safe return to any affected area. Without these, members of the Japanese public were skeptical of the levels once they were finally determined. For fixed facilities in Canada, it would be greatly beneficial to have set, scientifically-based reference levels for safe return established and publicized well ahead of any potential event.

Once again, let me thank you for the opportunity to comment on this Discussion Paper. If you require further information or have any questions regarding this submission, please contact Steve Cannon, Senior Strategist, Nuclear Oversight and Regulatory Affairs, at (519)-361-6559, or [steve.cannon@brucepower.com](mailto:steve.cannon@brucepower.com).

Yours truly,

A handwritten signature in black ink, appearing to read "Frank Saunders". Below the signature, the letters "FOR" are written in a smaller, simpler font.

Frank Saunders  
Vice President Nuclear Oversight and Regulatory Affairs  
Bruce Power

cc: CNSC Bruce Site Office (Letter only)  
K. Owen-Whitred, CNSC-Ottawa

Attach.

Bruce Power Frank Saunders Vice President - Nuclear Oversight and Regulatory Affairs  
P.O. Box 1540 B10 4th floor W Tiverton ON N0G 2T0  
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## **Attachment A**

### **Bruce Power comments on Discussion Paper DIS-17-01 - Framework for Recovery in the Event of a Nuclear or Radiological Emergency**

**Bruce Power comments on Discussion Paper DIS-17-01 - Framework for Recovery in the Event of a Nuclear or Radiological Emergency**

Section	Question(s)	Responses to Questions	Additional Comments
Scope	<p>Q1. Do you consider the scope appropriate in the context of establishing a recovery framework? If not, how should the scope be modified or improved?</p>	<p>To licensees, the scope and context seems overly complex, vague and focused on what is outside of scope rather than what is within scope. As a result, the paper does not clearly articulate what it is trying to achieve. For example, the next-to-last paragraph of Section 2 says, "In Canada, the framework for emergency preparedness and response is well established and documented in applicable legislation, information and guidance documents." Given that, what is the need for this document?</p> <p>Also, this paper focuses on activities in the public domain to protect members of the public and contains very little that applies to nuclear facilities. Yet the Executive Summary says the paper's purpose is to inform future regulatory guidance. How will a document focused on the public domain apply to licensees since CNSC Regulatory Documents do not apply to provincial and municipal authorities? Will the partnership with Health Canada (HC) in the development of this framework lead to an HC document that could apply to those authorities? It's not clear on how this document and resulting guidance will be used in the future.</p> <p>As this discussion progresses, licensees suggest:</p> <ul style="list-style-type: none"> <li>• There needs to be a clear understanding that a regulatory framework does not impede business decisions a utility might make within its own recovery operations for events that do not impose public safety risks.</li> <li>• The framework should develop scope to support a CSA standard on recovery, not the creation of another REGDOC. Details around roles and responsibilities of key stakeholders should be</li> </ul>	<p>It may be appropriate to have a link to the Nuclear Insurance Association of Canada website.</p>

**Bruce Power comments on Discussion Paper DIS-17-01 - Framework for Recovery in the Event of a Nuclear or Radiological Emergency**

Section	Question(s)	Responses to Questions	Additional Comments
	<p>Q2. Could we define our assumptions more clearly? If so, how?</p>	<p>addressed in the CSA standard.</p> <ul style="list-style-type: none"> <li>• It would be beneficial to include a specific reference to safe dose reference levels for the lifting of protective actions. Having thresholds for habitability or returns (post evacuation and sheltering) clearly set in advance of an accident scenario -- with scientific backing to these "safe return limits" -- would help ease potential confusion.</li> <li>• More details could be added on what, precisely, is in scope such as information on when recovery starts and ends. Similarly, more context could be added around multi-level recovery (organizations being at different levels of response/recovery).</li> <li>• More details could be added to clearly show the linkages between licensees, municipalities, provincial and federal governments/agencies.</li> <li>• Since emergency preparedness typically focuses on the response phase of a nuclear or radiological emergency, the CNSC could consider referring to Emergency Management as was done in section 2.0. Preparedness and Response are only two cornerstones.</li> </ul>	
	<p>Q2. Could we define our assumptions more clearly? If so, how?</p>	<p>Yes. The assumptions should more clearly identify Authorities Having Jurisdiction (AHJs) to be consistent with CSA N1600. Also, there should be an understanding that a CSA standard on recovery would be the preferred vehicle to address requirements. In this case, the lead provincial agency is the AHJ with other federal, provincial and municipal agencies in a supporting role.</p>	

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Plans for recovery in Canada	<p>Q3. Did we correctly capture the existing framework for recovery from a federal, provincial and municipal point of view? If not, please provide information as you see it, accompanied by the source of information that supports your proposal.</p> <p>Q4. Are there existing documents or sources of information that provide more clarity?</p>	<p>For the most part.</p> <p>However, the Department of National Defence (DND) has a role to play in responding to nuclear/radiological emergencies. Their role is defined in <i>DAOD 8006-0, Chemical, Biological, Radiological and Nuclear Defence</i> last updated in August 2016. This role needs to be taken into consideration in describing a Canadian framework for emergency response. Otherwise, a valuable resource is being overlooked.</p> <p>Also, most licensees have established frameworks to address their business decisions and internal needs to support recovery. Recovery operations that do not affect public safety are not appropriate for this framework.</p> <p>Most licensees maintain business continuity processes for recovery operations and detailed plans are developed as required.</p> <p>For instance, within New Brunswick, the <i>Point Lepreau Nuclear Off-site Emergency Plan for Radiological Emergencies</i> covers all aspects for the response and recovery. The municipalities fall under this plan and would not have their own specific plan for radiological events.</p> <p>The CNSC could consider adding an existing plan such as New Brunswick's at:  <a href="http://www2.gnb.ca/content/dam/gnb/Departments/ps-sp/pdf/emo/Nuclear/Pointlepreau-NOEM.pdf">http://www2.gnb.ca/content/dam/gnb/Departments/ps-sp/pdf/emo/Nuclear/Pointlepreau-NOEM.pdf</a></p>	

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Transition	<p>Q5. At the preparedness stage, do you consider that it is possible to establish a) responsibility and accountability during recovery and b) a mechanism for the transfer of responsibilities that will take place during the transition between the emergency and the recovery phases? If so, how? If not, why?</p>	<p>Yes, we feel it is possible to establish responsibilities, accountabilities and a transfer mechanism during this phase. Robust procedures, specific training and exercises -- including formal turnovers -- help ensure roles and responsibilities are addressed. Much of this is already in place. For example, Bruce Power's process sees its executive leaders (the Crisis Management Team) appoint an Emergency Recovery Director, who puts a team in place to assume control from the Commander of the Emergency Management Centre. This ensures a successful transition from emergency to recovery and provides flexibility for the Recovery Director to customize his team, since emergencies can present very different recovery requirements.</p> <p>While stability of the situation is a primary responsibility of the licensee -- and consideration should be added to clarify this in future guidance -- the province is still the lead beyond site boundaries. Therefore, the transfer of responsibilities will only be between government support organizations.</p> <p>Based on the Fukushima experience, the role of government support organizations is significant and critical to success. As a result, the roles and responsibilities of government support agencies have to be documented and agreed to well in advance of any potential event.</p> <p>Although this is possible, it should also be recognized that resources used in event response will likely be used for recovery. Considering that response and recovery from a radiological event could take weeks, months or even years, resources will have to be managed at the utility, municipal and provincial level. Smaller</p>	

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Section	Question(s)	Responses to Questions	Additional Comments
Protecting the public	<p><b>Q6.</b> Do you agree that the responsible recovery management organization should have the authority to select the appropriate reference level value(s) within the band of 1–20 mSv?</p>	<p>organizations may not practically be able to change out all individuals used for response as they transition to recovery.</p> <p>Yes. However, values will be much different for Nuclear Energy Workers (NEWS) performing recovery activities on site. This should be highlighted.</p>	
	<p><b>Q7.</b> Do you agree that the value should be set at the end of the emergency situation and should be periodically re-evaluated throughout the recovery? If you do not agree, please indicate why, as well as who should select the values and when that decision should be taken.</p>	<p>Partially.</p> <p>For transportation accidents, it would make sense to set the value at the end of the emergency situation.</p> <p>However, industry proposes setting the value ahead of any emergency situation for fixed facilities such as nuclear power plants. One of the lessons from Fukushima was that the Japanese government did not have predefined reference levels for safe returns to the affected area. This resulted in mistrust by the public when levels were finally determined. If this is done in advance -- with scientific backing -- then it will enhance public confidence in the level.</p> <p>The recovery should be staged with predefined reference levels and the evaluation focus on the state of progress through the recovery stages, but not redefining the reference levels.</p> <p>It is critical that reference levels be predetermined, using a solid scientific basis and that basis be transparent.</p>	

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Section	Question(s)	Responses to Questions	Additional Comments
Return to a new normal	Q8. Was the concept of the new normal well explained? What additional information should be provided to clarify the concept?	<p>While the key concepts are here, introducing the concept of a 'new normal' seems counterproductive. The text is fine, but to label it in this way gives a somewhat negative impression -- almost like saying, "This is the best we can do, so you might as well get used to it." In future documents, it would be better to simply refer to the return to affected areas. Similarly, the term "contaminated land" is unnecessarily alarmist and better described as the "affected area."</p> <p>Also, the concept may need some additional detail to ensure public understanding. For instance, will there be exceptions, such as pregnant woman, when individuals are allowed to live in a contaminated area? Should the 'new normal' also recognize potential realities such as the loss of electricity generation for the province if units are separated from the grid? Additional guidance or examples around levels that are higher than pre-emergency conditions would be helpful, as well as explanations about how radiological risk is determined and who communicates those risks.</p>	<p>As noted in Q7, for fixed facilities, it would be greatly beneficial to have set, scientifically-based reference levels for safe return established and publicized ahead of any event (the ICRP reference levels could be used). This will aid in public acceptance.</p> <p>Rather than say ... "should be allowed to live in contaminated areas," the document should state ... "should be allowed to live in areas with some residual levels of elevated radioactivity, providing the overall risk to the public is deemed acceptable."</p>
Implementing Recovery Strategies	<p>Q9. Did we capture the protective actions accurately? If not, what modifications or additions do you propose?</p> <p>Q10. Do you agree with the delineation of the two types of protective actions? Are there other types of protective actions that have not been considered? If so, what are they?</p>	<p>Not entirely as the discussion paper is using reference levels as limits. Considerations could be made for the harvesting of wildlife and aquaculture</p> <p>Yes.</p>	<p>It is critical that discussions on protective actions be held with any potentially affected community during this planning phase. This will ensure common understanding of what those actions mean and why they might be implemented for different situations.</p> <p>Suggest rewriting the phrase, "During the recovery phase, new protective actions may need to be taken to maintain doses below the desired reference level further reduce radiation doses as part of the ongoing optimization process."</p>

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Section	Question(s)	Responses to Questions	Additional Comments
Environmental and food chain monitoring	Q11. Did we make the correct assumptions regarding environmental and food chain monitoring? If not, what are we missing?	Yes, though consideration should be given to monitoring of fish and wildlife -- particularly wildlife that is hunted for food -- as these transient animals may move in and out of contaminated zones (this is not explicitly covered).	It is critical that we develop a single, consolidated guideline for all jurisdictions. This will also support the integration of the role of government support organizations.
	Q12. Did we adequately describe the need for environmental and food chain monitoring in the recovery phase? Is there information about the need for environmental and food chain monitoring that should be added? If so, what information?	Yes	
Exposure pathways and dose assessments	Q13. Did we make the correct assumptions regarding exposure pathways and dose assessments? If not, what are we missing?	Not entirely. With regard to external dose, experience from Fukushima shows that environmental monitoring can significantly overestimate the doses when compared to personal dosimetry. At a minimum, external doses based upon environmental monitoring need to be validated with personal dosimetry.	
Health monitoring	Q14. Did we identify all the necessary components regarding the health monitoring program? If not, what are we missing?	For the general public, it is critical that more clarity be provided regarding who would be responsible for what aspects of the monitoring. Industry proposes that high-level health monitoring plans be developed ahead of any potential emergency. This will make recovery much easier than trying to develop them on the fly. This could be developed as an Appendix to a CSA document on recovery.  For the licensee workforce, it is important for the CNSC to recognize that provincial health insurance programs which monitor health already exist. Licensees do provide counselling, psychological and psychosocial support when requested, but not medical monitoring for all workers. Medical physician(s) would be sought when there was any health concern. Introducing the requirement to establish a health monitoring program	

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		<p>would require a change in the legislative framework (e.g. <i>Nuclear Safety Control Act (NSCA)</i>, <i>Privacy Act</i> or pertinent regulations. As this subject progresses, industry suggests it is appropriate for licensees to provide counselling, psychological and psychosocial support for individual(s) who participated in the control of an emergency upon request. Special attention or follow-up would also be offered individual(s) who may have received a dose exceeding 50 mSv (5 rem) during and post emergency response activities.</p>	
Managing contamination	<p>Q15. Did we make the correct assumptions regarding decontamination? If not, what are we missing?</p>	<p>Yes.</p>	<p>Acceptable as-left levels of contamination should be set ahead of any emergency. This should follow the same strategy suggested for dose.</p>
	<p>Q16. Did we capture the decontamination elements accurately? If not, what modifications or additions are you proposing?</p>	<p>Yes.</p>	<p>Decontamination is addressed, but given the complexities associated with an event, it would be difficult to go into more depth of options or "what ifs."</p>
	<p>Q17. Are there other types of clean-up activities besides decontamination that need to be discussed in more detail? If so, what activities and what information is required?</p>	<p>No.</p>	<p>It is critical that the reference levels be predetermined, using a solid scientific basis and that basis be transparent.</p>
Waste management	<p>Q18. Did we make the correct assumptions regarding waste management? If not, what are we missing?</p>	<p>Yes.</p>	<p>In general, industry supports the overall objective as indicated in the paper to return occupants to their homes as soon as possible.</p> <p>For large releases, the majority of the waste could be soil, which is not easily volume-reduced. This is why it is important to define</p>

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	<p>Q19. Did we capture the waste management elements accurately? If not, what modifications or additions do you propose?</p>	<p>Yes.</p>	<p>acceptable as-left levels of contamination ahead of any emergency and that there be resources and plans developed in advance to clean up the waste as soon as possible. Fukushima is a good example of this, where decontamination efforts have resulted in large amounts of contaminated soil as waste.</p>
<p>Protecting the public during recovery</p>	<p>Q20. Did we make the correct assumptions regarding the key recovery elements? If not, what are we missing?</p>	<p>Yes</p>	<p>Resources should be identified and plans developed in advance to clean up the waste as soon as possible</p>
	<p>Q21. Did we capture the key recovery elements accurately? If not, what modifications or additions do you propose?</p>	<p>Yes</p>	
	<p>Q22. Is the level of information provided is adequate? If not, what subject needs to be described in more detail? Or what are the elements that we did not describe (if any)?</p>	<p>Yes</p>	<p>As previously stated, it is preferred that any framework for recovery be developed through the CSA process, not a REGDOC. The use of a CSA standard would assist in the harmonizing of government support agencies and the development of a single consolidated guideline for all jurisdictions and support the definition of accountabilities for all parties</p>
<p>Protecting recovery workers</p>	<p>Q23. What additional details would be valuable on this topic in the framework?</p>	<p>Industry would like to see details around the use of personal protective equipment (PPE) for recovery workers during this phase. This is a key part of response, but needs to be carried over and given the same rigor. Doses received by persons involved in the control of an emergency are treated separately from those received from planned occupational exposures, which include recovery efforts. Similarly, a distinction should be made with respect to radiation exposures received by workers during recovery efforts as a consequence of their occupation and those received as a result of exposures due to environmental conditions resulting from the emergency. Such a statement should also be included in</p>	

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Public communication considerations during recovery	<p>Q24. Did we capture the communication considerations during recovery accurately? If not, what modifications or additions do you propose?</p> <p>Q25. Is the level of information provided adequate? If not, what subject needs to be described in more details? Or what are the elements that we did not describe (if any)?</p>	<p>Section 15 of the Radiation Protection Regulations; SOR 2000/2003 (published Sept 22, 2017).</p> <p>Yes, though it would helpful to say that communications need to be completed in a timely manner and be consistently updated.</p> <p>Yes</p>	<p>In this area, it is very important that the Authority Having Jurisdiction (AHJ) have oversight on communications being distributed out by supporting agencies. The statement on consistent messages is paramount for public confidence.</p>

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Scope	Q1. Do you consider the scope appropriate in the context of establishing a recovery framework? If not, how should the scope be modified or improved?	<p>To licensees, the scope and context seems overly complex, vague and focused on what is outside of scope rather than what is within scope. As a result, the paper does not clearly articulate what it is trying to achieve. For example, the next-to-last paragraph of Section 2 says, “In Canada, the framework for emergency preparedness and response is well established and documented in applicable legislation, information and guidance documents.” Given that, what is the need for this document?</p> <p>Also, this paper focuses on activities in the public domain to protect members of the public and contains very little that applies to nuclear facilities. Yet the Executive Summary says the paper’s purpose is to inform future regulatory guidance. How will a document focused on the public domain apply to licensees since CNSC Regulatory Documents do not apply to provincial and municipal authorities? Will the partnership with Health Canada (HC) in the development of this framework lead to an HC document that could apply to those authorities? It’s not clear on how this document and resulting guidance will be used in the future.</p> <p>As this discussion progresses, licensees suggest:</p> <ul style="list-style-type: none"> <li>• There needs to be a clear understanding that a regulatory framework does not impede business decisions a utility might make within its own recovery operations for events that do not impose public safety risks.</li> <li>• The framework should develop scope to support a CSA standard on recovery, not the creation of another REGDOC. Details around roles and responsibilities of key stakeholders should be</li> </ul>	It may be appropriate to have a link to the Nuclear Insurance Association of Canada website.

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		<p>addressed in the CSA standard.</p> <ul style="list-style-type: none"> <li>• It would be beneficial to include a specific reference to safe dose reference levels for the lifting of protective actions. Having thresholds for habitability or returns (post evacuation and sheltering) clearly set in advance of an accident scenario -- with scientific backing to these “safe return limits” -- would help ease potential confusion.</li> <li>• More details could be added on what, precisely, is in scope such as information on when recovery starts and ends. Similarly, more context could be added around multi-level recovery (organizations being at different levels of response/recovery).</li> <li>• More details could be added to clearly show the linkages between licensees, municipalities, provincial and federal governments/agencies.</li> <li>• Since emergency preparedness typically focuses on the response phase of a nuclear or radiological emergency, the CNSC could consider referring to Emergency Management as was done in section 2.0. Preparedness and Response are only two cornerstones.</li> </ul>	
	<p>Q2. Could we define our assumptions more clearly? If so, how?</p>	<p>Yes. The assumptions should more clearly identify Authorities Having Jurisdiction (AHJs) to be consistent with CSA N1600. Also, there should be an understanding that a CSA standard on recovery would be the preferred vehicle to address requirements. In this case, the lead provincial agency is the AHJ with other federal, provincial and municipal agencies in a supporting role.</p>	

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Plans for recovery in Canada	Q3. Did we correctly capture the existing framework for recovery from a federal, provincial and municipal point of view? If not, please provide information as you see it, accompanied by the source of information that supports your proposal.	<p>For the most part.</p> <p>However, the Department of National Defence (DND) has a role to play in responding to nuclear/radiological emergencies. Their role is defined in <i>DAOD 8006-0, Chemical, Biological, Radiological and Nuclear Defence</i> last updated in August 2016. This role needs to be taken into consideration in describing a Canadian framework for emergency response. Otherwise, a valuable resource is being overlooked.</p> <p>Also, most licensees have established frameworks to address their business decisions and internal needs to support recovery. Recovery operations that do not affect public safety are not appropriate for this framework.</p>	
	Q4. Are there existing documents or sources of information that provide more clarity?	<p>Most licensees maintain business continuity processes for recovery operations and detailed plans are developed as required.</p> <p>For instance, within New Brunswick, the <i>Point Lepreau Nuclear Off-site Emergency Plan for Radiological Emergencies</i> covers all aspects for the response and recovery. The municipalities fall under this plan and would not have their own specific plan for radiological events.</p> <p>The CNSC could consider adding an existing plan such as New Brunswick's at:  <a href="http://www2.gnb.ca/content/dam/gnb/Departments/ps-sp/pdf/emo/Nuclear/PointLepreau-NOEM.pdf">http://www2.gnb.ca/content/dam/gnb/Departments/ps-sp/pdf/emo/Nuclear/PointLepreau-NOEM.pdf</a></p>	

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Transition	<p>Q5. At the preparedness stage, do you consider that it is possible to establish a) responsibility and accountability during recovery and b) a mechanism for the transfer of responsibilities that will take place during the transition between the emergency and the recovery phases? If so, how? If not, why?</p>	<p>Yes, we feel it is possible to establish responsibilities, accountabilities and a transfer mechanism during this phase. Robust procedures, specific training and exercises -- including formal turnovers -- help ensure roles and responsibilities are addressed. Much of this is already in place. For example, Bruce Power's process sees its executive leaders (the Crisis Management Team) appoint an Emergency Recovery Director, who puts a team in place to assume control from the Commander of the Emergency Management Centre. This ensures a successful transition from emergency to recovery and provides flexibility for the Recovery Director to customize his team, since emergencies can present very different recovery requirements.</p> <p>While stability of the situation is a primary responsibility of the licensee – and consideration should be added to clarify this in future guidance -- the province is still the lead beyond site boundaries. Therefore, the transfer of responsibilities will only be between government support organizations.</p> <p>Based on the Fukushima experience, the role of government support organizations is significant and critical to success. As a result, the roles and responsibilities of government support agencies have to be documented and agreed to well in advance of any potential event.</p> <p>Although this is possible, it should also be recognized that resources used in event response will likely be used for recovery. Considering that response and recovery from a radiological event could take weeks, months or even years, resources will have to be managed at the utility, municipal and provincial level. Smaller</p>	

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		<p>organizations may not practically be able to change out all individuals used for response as they transition to recovery.</p>	
Protecting the public	<p>Q6.Do you agree that the responsible recovery management organization should have the authority to select the appropriate reference level value(s) within the band of 1–20 mSv?</p>	<p>Yes. However, values will be much different for Nuclear Energy Workers (NEWs) performing recovery activities on site. This should be highlighted.</p>	
	<p>Q7.Do you agree that the value should be set at the end of the emergency situation and should be periodically re-evaluated throughout the recovery? If you do not agree, please indicate why, as well as who should select the values and when that decision should be taken.</p>	<p>Partially.</p> <p>For transportation accidents, it would make sense to set the value at the end of the emergency situation.</p> <p>However, industry proposes setting the value ahead of any emergency situation for fixed facilities such as nuclear power plants. One of the lessons from Fukushima was that the Japanese government did not have predefined reference levels for safe returns to the affected area. This resulted in mistrust by the public when levels were finally determined. If this is done in advance -- with scientific backing -- then it will enhance public confidence in the level.</p> <p>The recovery should be staged with predefined reference levels and the evaluation focus on the state of progress through the recovery stages, but not redefining the reference levels.</p> <p>It is critical that reference levels be predetermined, using a solid scientific basis and that basis be transparent.</p>	

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Return to a new normal	Q8. Was the concept of the new normal well explained? What additional information should be provided to clarify the concept?	<p>While the key concepts are here, introducing the concept of a 'new normal' seems counterproductive. The text is fine, but to label it in this way gives a somewhat negative impression -- almost like saying, "This is the best we can do, so you might as well get used to it." In future documents, it would be better to simply refer to the return to affected areas. Similarly, the term "contaminated land" is unnecessarily alarmist and better described as the "affected area."</p> <p>Also, the concept may need some additional detail to ensure public understanding. For instance, will there be exceptions, such as pregnant woman, when individuals are allowed to live in a contaminated area? Should the 'new normal' also recognize potential realities such as the loss of electricity generation for the province if units are separated from the grid? Additional guidance or examples around levels that are higher than pre-emergency conditions would be helpful, as well as explanations about how radiological risk is determined and who communicates those risks.</p>	<p>As noted in Q7, for fixed facilities, it would be greatly beneficial to have set, scientifically-based reference levels for safe return established and publicized ahead of any event (the ICRP reference levels could be used). This will aid in public acceptance.</p> <p>Rather than say ... "should be allowed to live in contaminated areas," the document should state ... "should be allowed to live in areas with some residual levels of elevated radioactivity, providing the overall risk to the public is deemed acceptable."</p>
Implementing Recovery Strategies	Q9. Did we capture the protective actions accurately? If not, what modifications or additions do you propose?	Not entirely as the discussion paper is using reference levels as limits. Considerations could be made for the harvesting of wildlife and aquaculture	<p>It is critical that discussions on protective actions be held with any potentially affected community during this planning phase. This will ensure common understanding of what those actions mean and why they might be implemented for different situations.</p> <p>Suggest rewriting the phrase, "During the recovery phase, new protective actions may need to be taken to <del>maintain doses below the desired reference level</del> further reduce radiation doses as part of the ongoing optimization process."</p>
	Q10. Do you agree with the delineation of the two types of protective actions? Are there other types of protective actions that have not been considered? If so, what are they?	Yes.	

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Section	Question(s)	Responses to Questions	Additional Comments
Environmental and food chain monitoring	Q11. Did we make the correct assumptions regarding environmental and food chain monitoring? If not, what are we missing?	Yes, though consideration should be given to monitoring of fish and wildlife -- particularly wildlife that is hunted for food -- as these transient animals may move in and out of contaminated zones (this is not explicitly covered).	It is critical that we develop a single, consolidated guideline for all jurisdictions. This will also support the integration of the role of government support organizations.
	Q12. Did we adequately describe the need for environmental and food chain monitoring in the recovery phase? Is there information about the need for environmental and food chain monitoring that should be added? If so, what information?	Yes	
Exposure pathways and dose assessments	Q13. Did we make the correct assumptions regarding exposure pathways and dose assessments? If not, what are we missing?	Not entirely. With regard to external dose, experience from Fukushima shows that environmental monitoring can significantly overestimate the doses when compared to personal dosimetry. At a minimum, external doses based upon environmental monitoring need to be validated with personal dosimetry.	
Health monitoring	Q14. Did we identify all the necessary components regarding the health monitoring program? If not, what are we missing?	<p>For the general public, it is critical that more clarity be provided regarding who would be responsible for what aspects of the monitoring. Industry proposes that high-level health monitoring plans be developed ahead of any potential emergency. This will make recovery much easier than trying to develop them on the fly. This could be developed as an Appendix to a CSA document on recovery.</p> <p>For the licensee workforce, it is important for the CNSC to recognize that provincial health insurance programs which monitor health already exist. Licensees do provide counselling, psychological and psychosocial support when requested, but not medical monitoring for all workers. Medical physician(s) would be sought when there was any health concern. Introducing the requirement to establish a health monitoring program</p>	

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		<p>would require a change in the legislative framework (e.g. <i>Nuclear Safety Control Act (NSCA)</i>, <i>Privacy Act</i> or pertinent regulations. As this subject progresses, industry suggests it is appropriate for licensees to provide counselling, psychological and psychosocial support for individual(s) who participated in the control of an emergency upon request. Special attention or follow-up would also be offered individual(s) who may have received a dose exceeding 50 mSv (5 rem) during and post emergency response activities.</p>	
Managing contamination	Q15. Did we make the correct assumptions regarding decontamination? If not, what are we missing?	Yes.	Acceptable as-left levels of contamination should be set ahead of any emergency. This should follow the same strategy suggested for dose.
	Q16. Did we capture the decontamination elements accurately? If not, what modifications or additions are you proposing?	Yes.	Decontamination is addressed, but given the complexities associated with an event, it would be difficult to go into more depth of options or “what ifs.”
	Q17. Are there other types of clean-up activities besides decontamination that need to be discussed in more detail? If so, what activities and what information is required?	No.	<p>It is critical that the reference levels be predetermined, using a solid scientific basis and that basis be transparent.</p> <p>In general, industry supports the overall objective as indicated in the paper to return occupants to their homes as soon as possible.</p>
Waste management	Q18. Did we make the correct assumptions regarding waste management? If not, what are we missing?	Yes.	For large releases, the majority of the waste could be soil, which is not easily volume-reduced. This is why it is important to define

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	Q19. Did we capture the waste management elements accurately? If not, what modifications or additions do you propose?	Yes.	acceptable as-left levels of contamination ahead of any emergency and that there be resources and plans developed in advance to clean up the waste as soon as possible. Fukushima is a good example of this, where decontamination efforts have resulted in large amounts of contaminated soil as waste.
Protecting the public during recovery	Q20. Did we make the correct assumptions regarding the key recovery elements? If not, what are we missing?	Yes	Resources should be identified and plans developed in advance to clean up the waste as soon as possible
	Q21. Did we capture the key recovery elements accurately? If not, what modifications or additions do you propose?	Yes	
	Q22. Is the level of information provided is adequate? If not, what subject needs to be described in more detail? Or what are the elements that we did not describe (if any)?	Yes	
Protecting recovery workers	Q23. What additional details would be valuable on this topic in the framework?	<p>Industry would like to see details around the use of personal protective equipment (PPE) for recovery workers during this phase. This is a key part of response, but needs to be carried over and given the same rigor.</p> <p>Doses received by persons involved in the control of an emergency are treated separately from those received from planned occupational exposures, which include recovery efforts. Similarly, a distinction should be made with respect to radiation exposures received by workers during recovery efforts as a consequence of their occupation and those received as a result of exposures due to environmental conditions resulting from the emergency. Such a statement should also be included in</p>	As previously stated, it is preferred that any framework for recovery be developed through the CSA process, not a REGDOC. The use of a CSA standard would assist in the harmonizing of government support agencies and the development of a single consolidated guideline for all jurisdictions and support the definition of accountabilities for all parties

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		Section 15 of the Radiation Protection Regulations; SOR 2000/2003 (published Sept 22, 2017).	
Public communication considerations during recovery	Q24. Did we capture the communication considerations during recovery accurately? If not, what modifications or additions do you propose?	Yes, though it would helpful to say that communications need to be completed in a timely manner and be consistently updated.	In this area, it is very important that the Authority Having Jurisdiction (AHJ) have oversight on communications being distributed out by supporting agencies. The statement on consistent messages is paramount for public confidence.
	Q25. Is the level of information provided adequate? If not, what subject needs to be described in more details? Or what are the elements that we did not describe (if any)?	Yes	